

Part 2. Market Failure II

Externalities and Public Goods

External Effects, Coase Theorem, Transaction Cost,
Public Goods, Free Rider Problem

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Externalities

Introduction

Externalities = External effects

- Negative externality (external cost):
A cost that falls on people other than those that pursue the activity/are part of the transaction, e.g.
 - Smoking
 - Pollution
 - Overfishing (Tragedy of the Commons)

Introduction

- Positive externality (External Benefit)

A benefit received by people other than those that pursue the activity/are part of the transaction, e.g.

- Gardening
- Education
- Bee farming

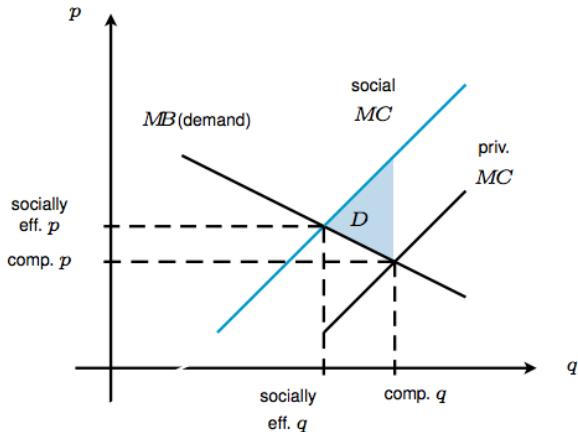
Externalities and Markets

Externalities cause market failure.

- Individuals who consider only their own cost and benefit will tend to engage
 - **Too much** in activities that generate **negative externalities**
 - **Too little** in activities that generate **positive externalities**

With external effects, the equilibrium in competitive markets is no longer Pareto efficient

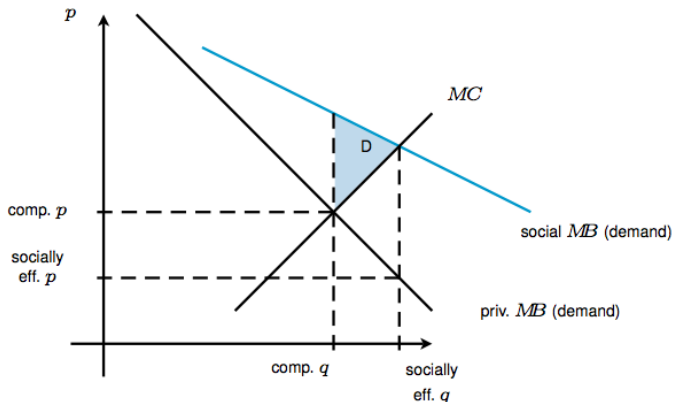
Market Failure: Negative Externality



Negative Externality

triangle D = deadweight loss

Market Failure: Positive Externality



Positive Externality

triangle D = deadweight loss

Example

- Two roommates, Harry (H) and Sally (S); Sally smokes.
- If S consumes q cigarettes, utilities are

$$u_S = 4\sqrt{q} + \text{money} \quad u_H = -0.5q + \text{money}$$

- Let $p = 1$ price per cigarette, then $\text{money} = -pq = -q$, and the first order condition for Sally is:

$$\frac{du_S}{dq} = \frac{2}{\sqrt{q}} - 1 = 0$$

⇒ utility maximizing consumption for Sally is
 $q^{priv} = 4$ cigarettes

Example (Cont'd)

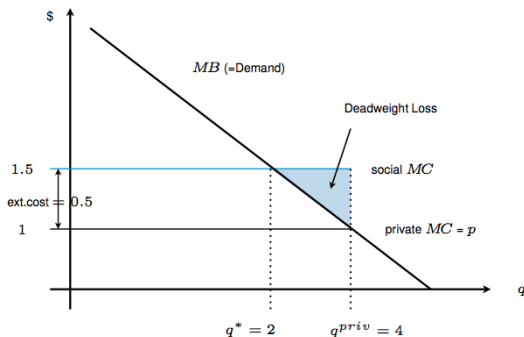
- Outcome is Pareto inefficient: Socially Optimal quantity is $q^* = 2$, since

$$U_T = u_S + u_H = 4\sqrt{q} - q - 0.5q + \text{money}$$

$$\Rightarrow \frac{dU}{dq} = \frac{2}{\sqrt{q}} - 1 - 0.5 = 0$$

$$\Rightarrow q^* \sim 2$$

- graphically:



Example (Cont'd)

- But: Gains from trade exist
- ⇒ H and S could negotiate agreement (contract) where:
- H compensates S for not smoking
 - outcome will be $q = 2$ (efficient)
 - or
 - S compensates H for being allowed to smoke
 - outcome will be $q = 2$ (efficient)

The Coase Theorem

People can arrive at an efficient solution to the problem of externalities by **negotiating** the purchase and sale of the (legal) right to engage in the activities that cause the externality

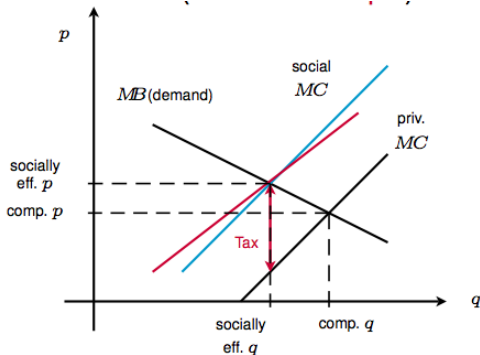
- The efficient solution may not depend on who has the property rights
- The distribution of benefits and costs always depends on who has the property rights

Failure of Coasian Bargaining

- Negotiations between private parties (Coasian bargaining) not always feasible or practical because of **transaction cost**
- Transaction cost:
 - Bargaining cost
 - Missing (legal) property rights
 - Asymmetric information

Public Regulation

- Remedies:
 - Pigouvian taxes and subsidies (see also [example](#))



- Quotas
- Tradeable permits and auctions

Public Goods

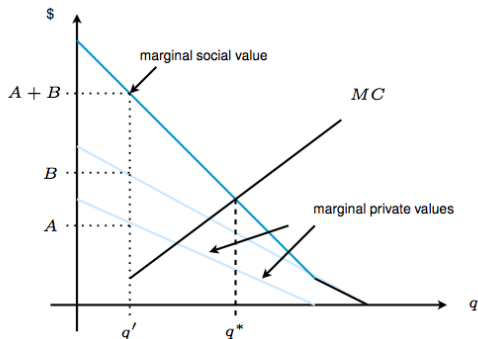
Public Goods

- **Public Goods** are a special case of externality where everybody consumes the same amount

They are characterized by

- **Non-rivalry:** good can be consumed by many people simultaneously
- **Non-excludability:** costly or impossible to deny people access to good
- Pure public goods are completely nonrivalrous and nonexcludable
- Examples: national defence, fireworks, nature and parks, rural highways, inventions

Efficient Public Good Provision



the Pareto optimal quantity of a pure public good is where the sum of the individual marginal benefits (MRS 's) equals the marginal cost

Private vs Public Provision of Public Goods

- Public goods are often provided by some public authority
- Private provision of public goods through voluntary contributions usually leads to **underprovision** due to the **free rider problem** (see Part 3.)
- Public provision of public goods not always efficient either (e.g. voting)