Public Economics

CHAPTER I. ANALYSIS OF THE PUBLIC SECTOR INTERVENTION

2.2 Theory of Public Goods and Externalities

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1. Public goods: concept and classification (I)

THEORY OF THE "NOBEL" PAUL SAMUELSON (1954)

- **Definition of PUBLIC GOODS according to market failures (non-rival consumption and/or non-exclusion).**
- **E.g.: National Defense, legal justice, lighthouse, uncongested highway, medical research, fireworks, etc.**
- **This concept is PURE PUBLIC GOOD (NON-RIVAL IN CONSUMPTION).**

- **In fact, there are few "pure" goods. Thus, goods whose available quantity can be reduced (RIVAL IN CONSUMPTION) are IMPURE GOODS.**
- **Example: congested highway.**

- **Defining Public Good is not categorical.**
- **Impure Goods will be provided by the Public or Private sector according to social importance given to it. Example: Park (Public) / Cinema (Private).**

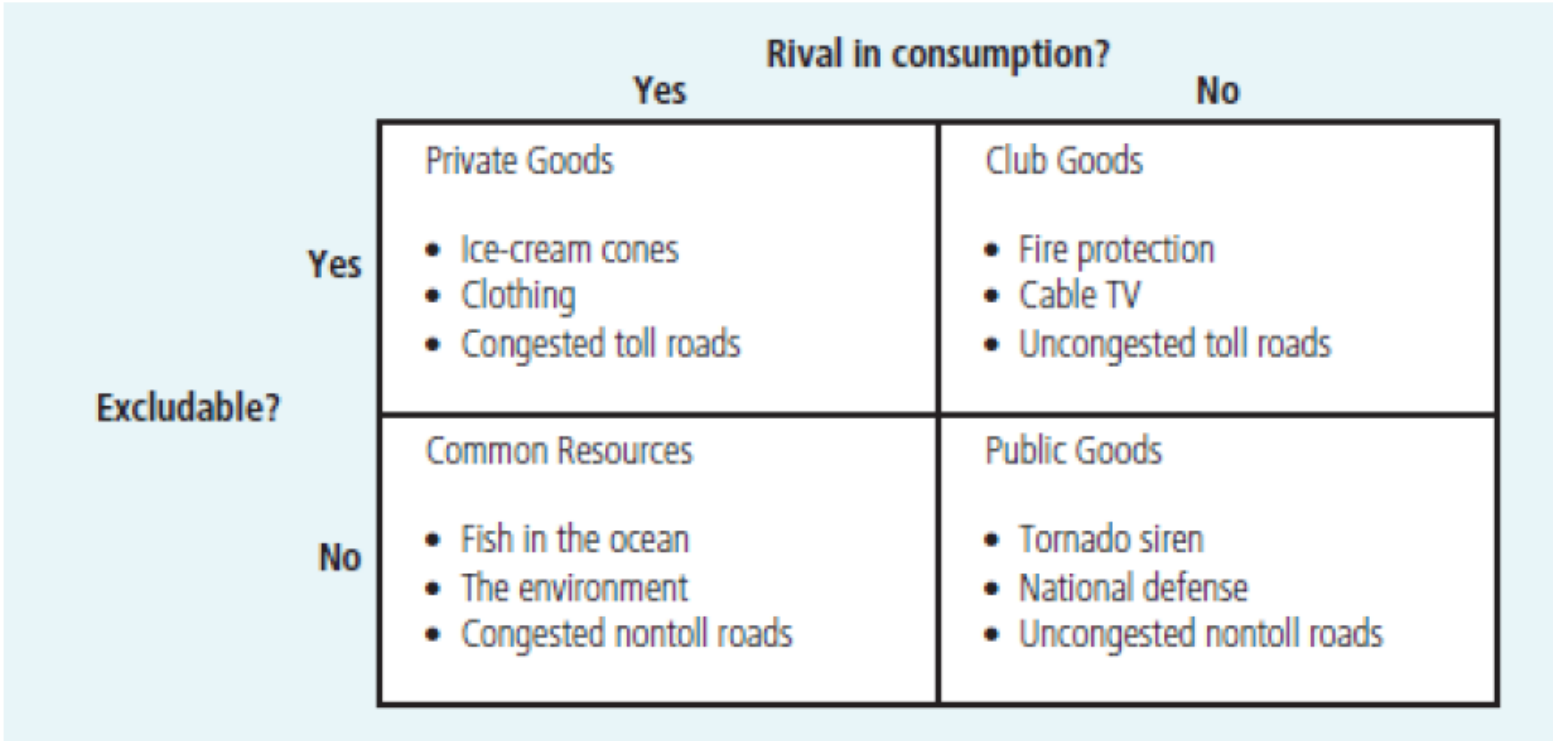
- **LOCAL PUBLIC GOODS: those whose benefits extend to a specific territory, being pure Public Goods in it and outside they become Impure Public Goods.**
- **Example: fire station, hospital, library, street lighting, etc.**
- **It will be convenient: if they are supplied and provided by local jurisdiction.**

1. Public goods: concept and classification (II)

- **GOODS may be EXCLUDABLE or NON-EXCLUDABLE (price may or may not be applied according to technical progress).**
- **Example: Excludable (toll road) / Non-excludable (National Defense-Missile) / It was non-excludable before, and now it is (TV-Pay Channels).**
- **This characteristic makes it possible to be supplied or not by market.**
  - **If EXCLUDABLE, provision can be made by company.**
  - **If NON-EXCLUDABLE, private provision will not be possible because the non-payer cannot be excluded from consumption.**
  - **When the Good is non-excludable, there are incentives to FREE-RIDERS ("free-of-charge consumers" or "stowaways" or subjects who do not request the good in order not to pay and then consume it). Example: fireworks (patronal feasts).**
  - **If all consumers did the same, goods would not be provisioned.**
- **WITH NON-EXCLUDABLE GOODS, IT IS MORE EFFICIENT TO BE PROVIDED (FINANCED) BY THE PUBLIC SECTOR.**

1. Public goods: concept and classification (III)

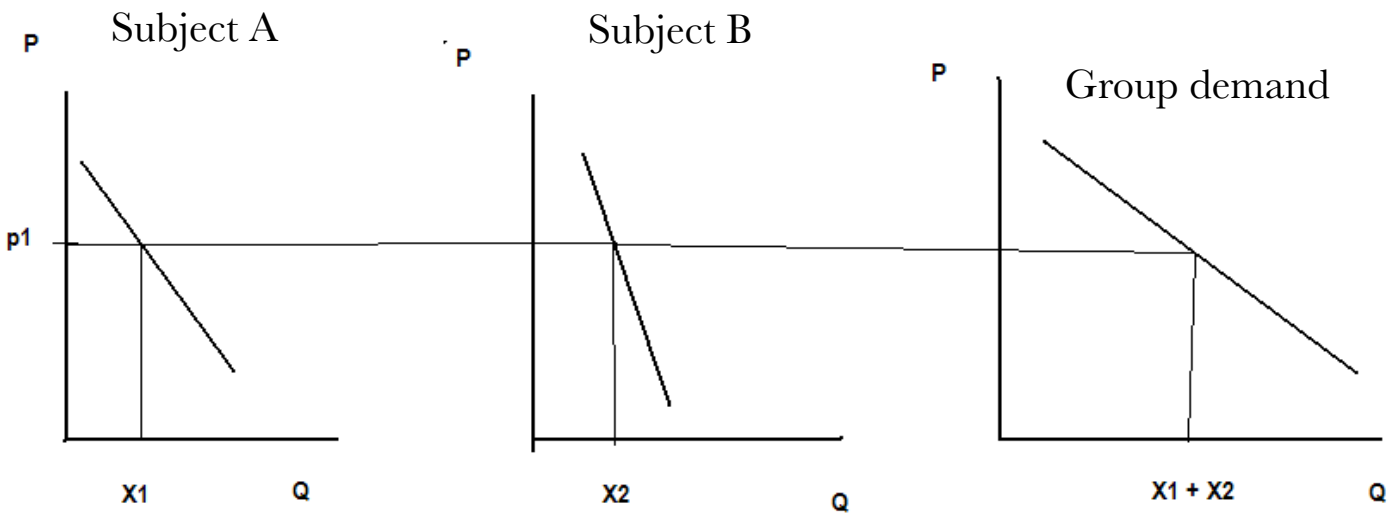
- **Case 1: PRIVATE GOODS (e.g., Education and Health): rival in consumption + possibility of exclusion.**
- **Case 2: COMMON RESOURCES: impossibility of exclusion (or high costs).**
- **Case 3: PURE PUBLIC GOODS: non-rival in consumption + impossibility of exclusion.**
- **Case 4: CLUB GOODS: non-rival in consumption + possibility of exclusion.**



Source: MANKIW (2016)

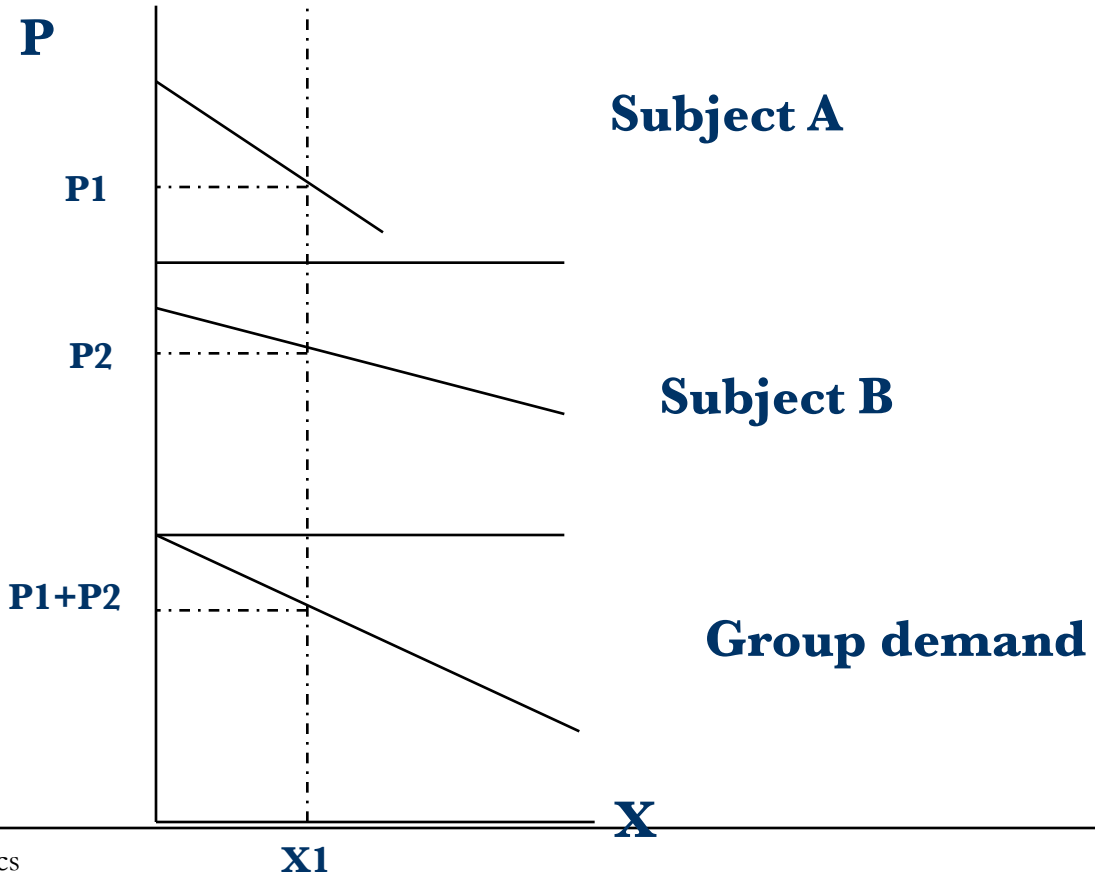
2. The optimal provision of public goods. Partial equilibrium (I)

- **PRIVATE GOOD: joint demand formation.**
- **$MRS_A = MRS_B = MRT$**



2. The optimal provision of public goods. Partial equilibrium (II)

- **PUBLIC GOOD: joint demand formation.**
- **$MRS_A + MRS_B = MRT$**



2. The optimal provision of public goods. Partial equilibrium (III)

- **Private provision of Public Goods, excludable or not, is inefficient.**
- **If they are NOT EXCLUDABLE: the problem is that the amount provided by the market is zero.**
- **If they are EXCLUDABLE (they can be priced): private provision is possible, but it will be done at doubly inefficient levels.**
  - **On the one hand, quantity produced will be *UNDER-CONSUMED*.**
  - **If consumption of the good is non-rival, when G is supplied, each subject will pay the price set by each company, but some will decide not to pay it. As it is then consumed by everyone (Free-Rider problem) it would be inefficient.**
  - **Example: cable TV, private park.**
  - **On the other hand, *UNDER-PRODUCTION*.**
  - **Less than an efficient quantity will be supplied as the company only observes demand from those willing to pay the price that is set.**
  - **Example: A private park is smaller than a public one.**

2. The optimal provision of public goods. Partial equilibrium (IV)

- **Inability of the Private Sector to efficiently provide Public Goods leads to Market Failures, and opens the possibility of Public Sector intervention to improve efficiency.**
- **But, this gain is only possible if the Public Sector establishes mechanisms of provision that guarantee to all subjects (identifying their preferences through Collective Choice mechanisms) an efficient level of G *, although it is unlikely that public action to guarantee efficiency.**
- **A tax can be established to but it does not solve all the problems of supplying Public Goods:**
  1. **It is still necessary to determine consumer preferences.**
  2. **Even if free riders are eliminated, consumers knowing that they have to pay, they will probably demand more than they need.**
  3. **Any tax that is established (except for the lump-sum tax) will create an inefficiency in the economic system.**
- ***The choice arises between imperfect alternatives: inefficient market allocations versus perhaps inefficient collective allocations ("free-riders").***
- **It is difficult to conclude whether public intervention will always be preferable to private provision.**
- **Final considerations:**
  - **Despite their practical importance, there are few Pure Public Goods.**
  - **It is possible to design mechanisms that allow private provision of these goods, even if NO EXCLUSION is feasible. Example: private TV ("forced" advertising consumption) before encrypted.**

3. Concept and allocative implications of externalities (I)

- **Example: Paper and dioxin factories, is it an efficient result? (Prices?).**
- **Actions of economic agents affect the welfare of others (Example: lower demand for cars benefits consumers and harms producers + employees). It is reflected in Prices. Change in RMT or RMS⇒ new market equilibrium.**
- **Market action ⇒ some income distribution (benefits some and harms others).**
- **If the actions are reflected in Prices, there is no inefficient allocation.**
- **There are actions that harm or benefit others and they are not reflected in prices. Example: Pollution, Smoking, Bar not soundproof.**
- **If an agent's action harms or benefits another without being reflected in prices ⇒ *EXTERNAL EFFECT (EXTERNALITY)***

3. Concept and allocative implications of externalities (II)

- **Due to the difficulty or impossibility of defining PROPERTY RIGHTS. They are also NON-RIVAL CONSUMPTIONS.**

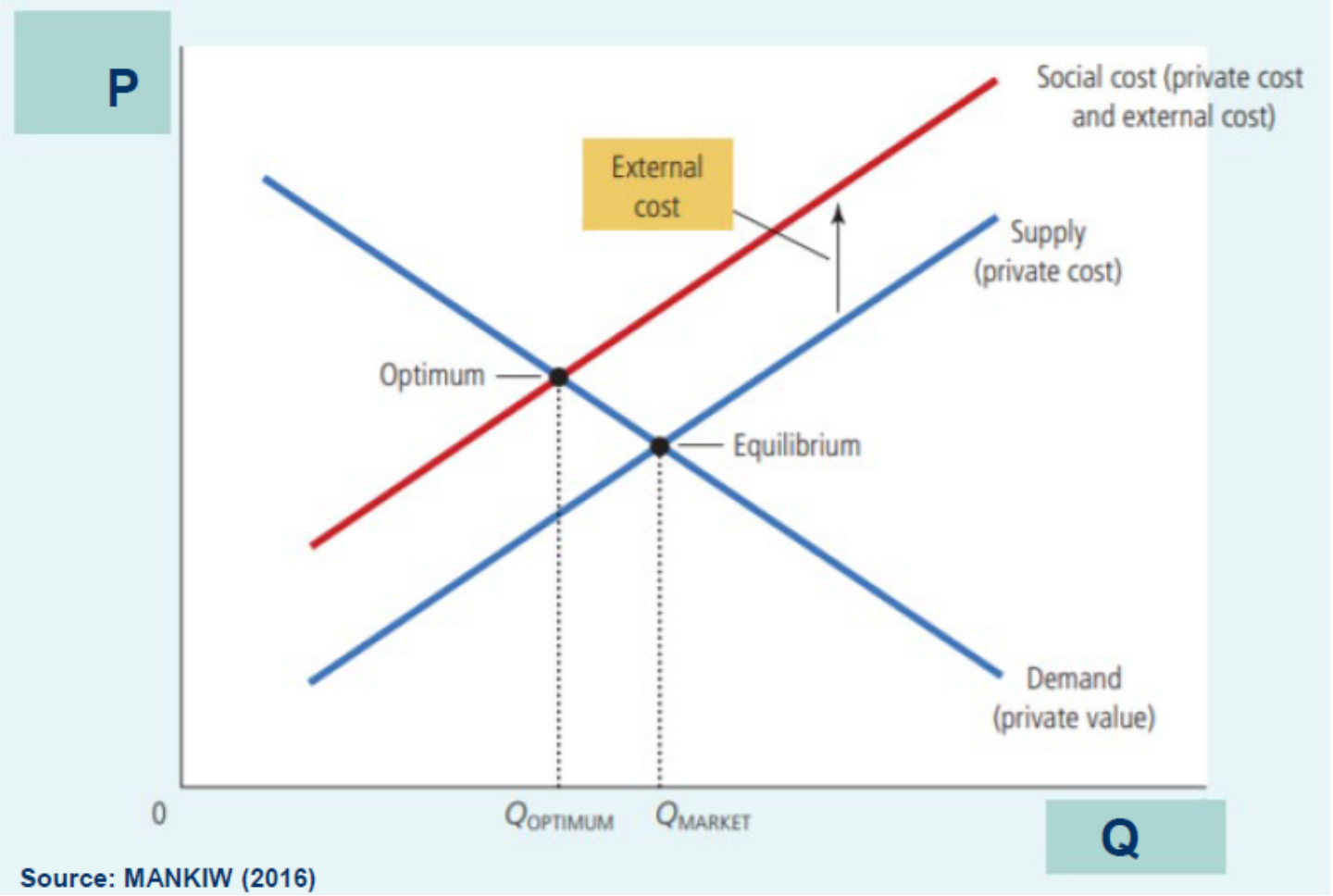
- **Characteristics:**
  - By consumers and by producers. Reciprocal in nature.
  - They are (+) POSITIVE or (-) NEGATIVE.
  - Public goods are a special case of external effect (pure externalities).

- **If externality (-) (we harm someone at cost 0) ⇒ the output is greater than the desired one. Example: Pollution, Noise, Tobacco, etc.**

- **If externality (+) (agent's activity benefits the rest) ⇒ the quantity is lower than the desired one. Example: Bus and not car, Primary education, Healthcare, etc.**

- **Main difference between Public Goods and Externalities⇒ Externalities (such as pollution) are a consequence of the main activity while Public Goods (for example, road) are provided in advance to benefit the collective.**

3. Concept and allocative implications of externalities (III)



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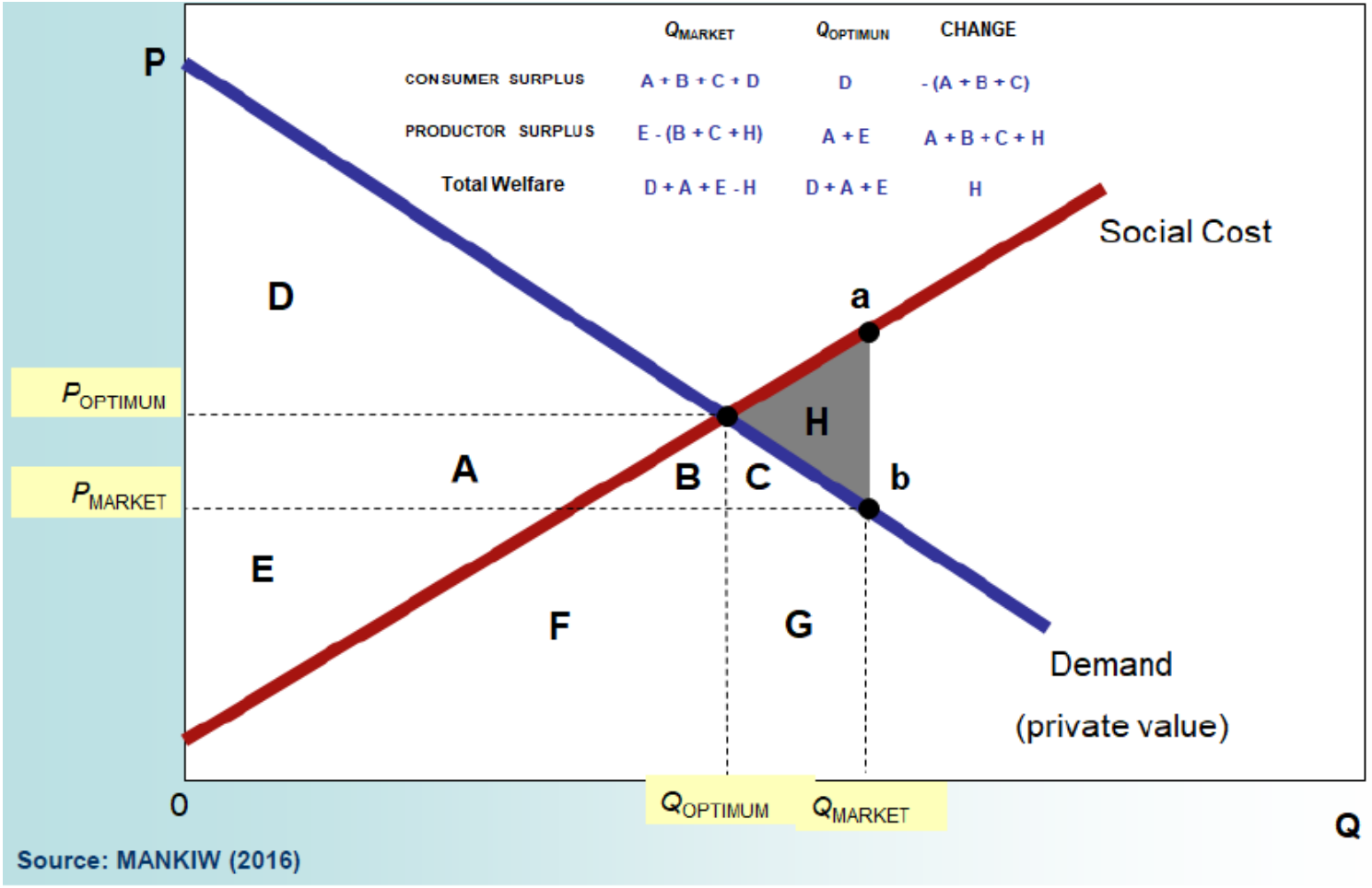
3. Concept and allocative implications of externalities (IV)



4. Public intervention in the presence of externalities. The subsidies, taxation and regulation (I)

A) REGULATION.

- **If we know (we quantify) the marginal damage (DMg) for a certain activity, regulation has to restrict production or consumption to the point of efficiency (Xe = Qoptimun).**

- **Problems:**
  - **Unobservable DMg and no incentives to reveal it (exaggerating it with pollution), different DMg in each case (they use uniform standards), coercive solution difficult to apply with external effects (+) (example: public transport, health services, …).**
  - **Perhaps more frequent public intervention (regulating externalities (-) production or consumption) and sometimes lobbying is more important than economic calculation (example: CO2 pollution).**

4. Public intervention in the presence of externalities. Subsidies, taxation and regulation (II)

B) FINANCING (*Corrective Taxes and Subsidies*, Pigou 1932).

- **Taxes will limit and subsidies will encourage private sector action. With perfect information, taxation and regulation ⇒ same level of production. Difference between these interventions: distribution of profits.**
- **If externality (-), the Public Sector may penalise the producing company by forcing it to pay tax. If externality (+), subsidise activity to Δproduction.**
- **Example: Pigou Tax ("*polluter pays*", e.g., in Spain according to the Environmental Responsibility Law 2010: Tax *t* euros per unit produced ⇒ Private (where t = ab). E.g: congestion tax (vehicle size and circulation time?) traffic London, Singapore, Stockholm, etc. and *"tragedy of the commons"* (congestion and NO2 pollution).**
- **Problems:**
  - **Unobservable DMg, Taxes and Subsidies (example: education, public transport, ...) different optimal corrective per cases, no guarantee of efficiency unlike regulation (because of its indirect cost it is assimilated differently or affects via prices) although preferable by the Public Sector.**

5. Allocation of property rights and the Coase Theorem (I)

- **Problem: lack of well allocated PROPERTY RIGHTS without costs. 1st: delimit them.**

- **Assign property rights e.g. to the "polluter" and *Nobel Prize Theorem COASE* (1960). *If information is perfect and negotiation between parties is not expensive, assigning property rights will result in internalising the external effect.***

- **Another + restrictive interpretation of Coase: negotiation without costs and perfect information about externalities gives efficient results, but not independent of who has property rights.**

- **That efficient result is the same regardless of who has property rights: if quasi-linear preferences and assuming Demand for the good is independent of income distribution (no income effect, only substitution).**

- **Affected parties will privately negotiate up to efficiency in consumption of X. Open "market" for external effect (price-emision). Example: "*pollution permit market*".**

5. Allocation of property rights and the Coase Theorem (II)

- **Coase Theorem Problems. Justice criteria and restrictive assumptions.**
  - ***Negotiation costs*. Positive externalities affect many agents at the same time, and "deal costs" are prohibitive. Example: pollution in a big city (many affected).**
  - **Not perfect *availability of information* (free-rider problem with> 2 injured (benefited) by external effect - (+), and greater than Δ nº affected.**
  - **Necessary to identify DMg. Main difficulty is setting negotiable permits (example: pollution) due to lack of historical experience.**
  - **Taxes are known and accepted, but negotiable permits are scarce and the Public Sector is reluctant to apply them.**
  - **Unless there are few agents affected by external effects, private solutions to externalities by negotiation of the Coase Theorem are difficult.**
  - **Coase lacked this idea: not only individual private property is a coordination mechanism, but also communal private property (this would be done by Nobel: E. Ostrom).**

5. Allocation of property rights and the Coase Theorem (III)

Create larger decision units that encompass generators and receivers.

- **Externalities ⇒ inefficient allocation because its generators, when deciding, do not take into account the welfare of recipients.**
- **Example: Highway in municipality, facilitates traffic and residents in another.**
- **The optimum: create a level of government with jurisdiction in both municipalities and give it powers on roads.**
- **With pollution ⇒ harmful (incentives to acquire polluting company)**
- **This solution, similar to Coase, is applicable only if externalities affect few agents.**

Faced with negative externalities, resort to auctioning property rights

- **Example: In pollution, polluting rights would be issued by optimal level with efficient production, and it would be put up for sale among competitive companies.**
- **Sale price of rights according to the marginal value of the last unit of pollution allowed.**
- **Result equivalent to PIGOU tax, since the right to pollute price is the same as the optimal corrective tax rate.**

6. A reference to Externalities (+/-) of consumption (market failures in allocation) (I)

- **PREFERRED OR UNDESIRABLE GOODS. Characteristics:**
  - **A certain degree of "advertising": external economies are derived from its consumption.**
  - **Distributive elements (access to minimum welfare with positive externalities and other goods).**
  - **Information problems ("deformed preferences") that would make your consumption level less than efficient.**

Preferred Goods Ext +	Undesirable Goods Ext -
Possibility that people do not value all the benefits derived from its consumption.	Possibility that people do not value all the damages that arise from its consumption.
Inefficient demand.	Demand above efficiency levels.
Examples: health, education, culture, housing, etc.	Examples: tobacco, other drugs, alcohol, etc. "sin goods"

6. A reference to Externalities (+/-) of consumption (market failures in allocation) (II)

- **Externalities: If market prices do not reflect all the costs and social benefits associated with the production of the good, but only those of a private type.**

PUBLIC SECTOR INTERVENTION:
Tax, fine or penalty EXTERNALITY (-) / UNDESIRABLE GOODS "SIN TAXES" (and "FAT TAXES", "JUNK FOOD TAX", "SNACK TAX")
Subsidies EXTERNALITIES (+) / PREFERRED GOODS
Regulation: Technique Maximum or minimum prices Maximum or minimum quantities Limit or prohibit production. EXAMPLE: TOBACCO
Direct provision (NOT NECESSARILY PRODUCTION) of goods that generate positive externalities. EXAMPLE: HEALTH and EDUCATION.