

Econ 301: Managerial Economics

Topic 3: Market Failures

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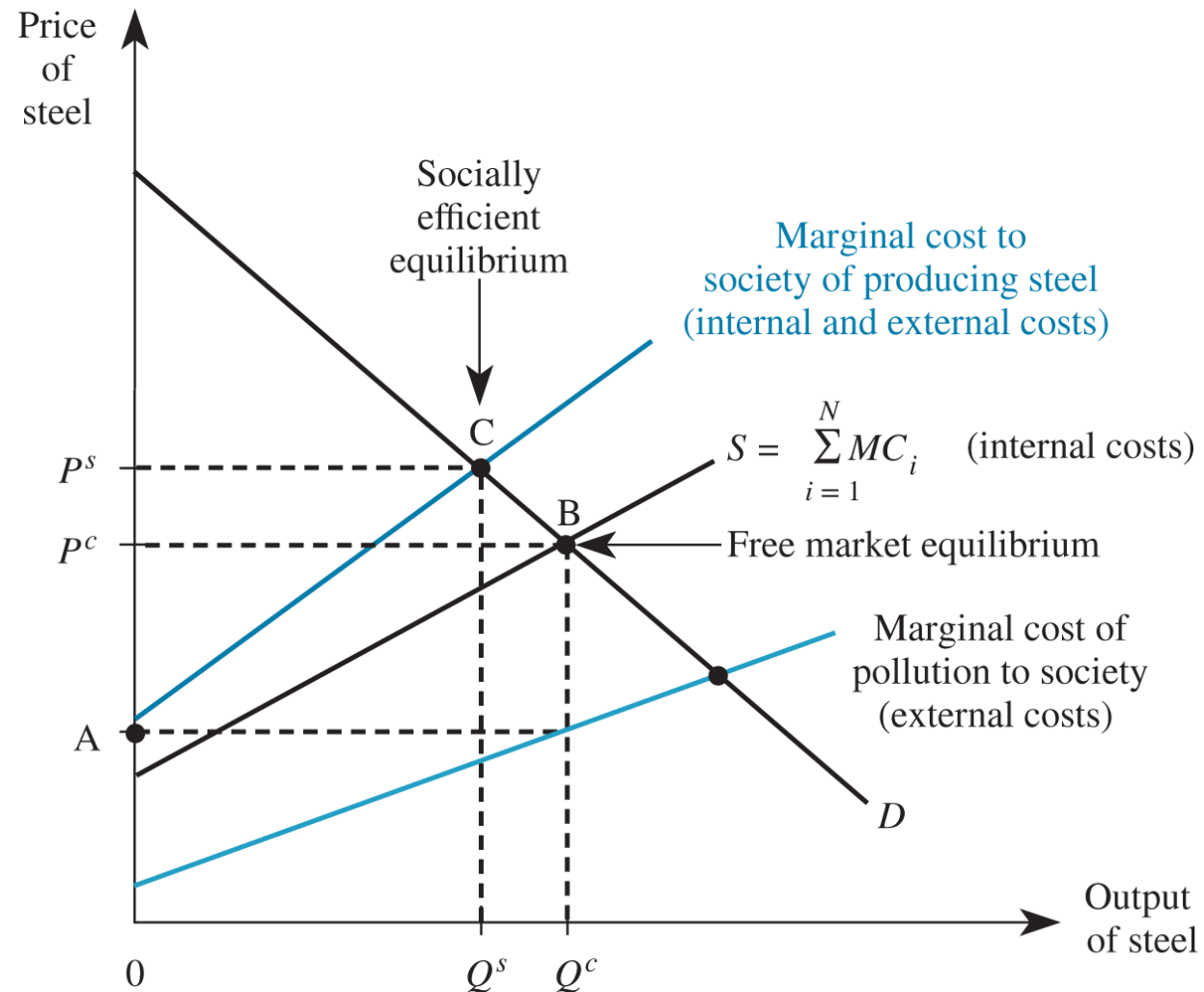
Overview

- The Free market is a 'quite a good' mechanism at efficiently allocating resource.
- However, free markets do not always result in socially efficient quantities of goods at socially efficient prices. Sources of market failure are:
 1. Market Power (will discuss in later weeks)
 2. Externalities
 3. Public Goods
 4. Incomplete Information

Externalities

- **Externalities**
 - The **costs** or **benefits** of a market activity that affect a **third** party
- ***Negative externalities*** exist when costs are borne by parties who are not involved in the production or consumption of a good or service. Examples include Pollution, Noise (loud music), public intoxication.
- The reason externalities cause a “market failure” is the absence of well-defined *property rights*.
- The failure is often resolved when a government defines itself to be the owner of the environment and uses its power to induce the socially efficient levels of output and pollution.

Negative Externalities



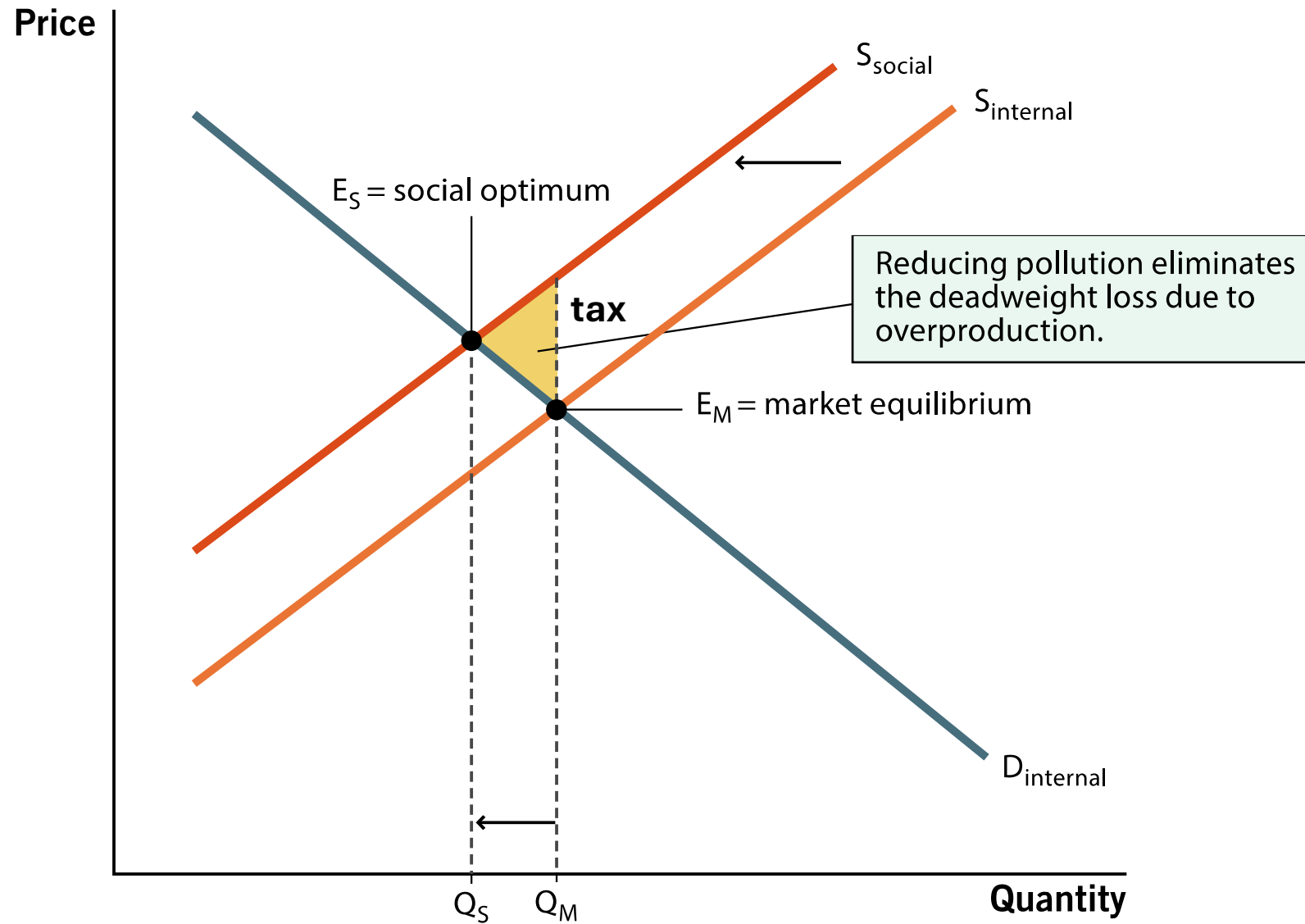
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Solving Negative Externalities

To solve the externality problem caused by pollution, the U.S. Congress passed the *Clean Air Act* in 1970 and made sweeping changes with amendments in 1990.

- Firms that operate in industries that release over 10 tons per year of a pollutant, or 25 tons per year of a combination of pollutants, on a specified list are required to obtain a permit to emit pollution into the environment.
- The Clean Air Act causes firms to internalize the cost of emitting pollutants since the permits are costly to acquire. This raises marginal cost and induces firms to produce less.
- Permits can be sold, which induces firms to invest in new technologies.

Solving Negative Externalities



Coase Theorem

- **Coase Theorem:** If transaction costs are low, with well defined and tradeable property rights, parties can bargain voluntarily to reach the efficient outcome.
- The negative externality can be internalised through monetary payment.
- Examples:
 - The large hat
 - Neighbour playing loud music
 - Consider a **Wheat Farmer** and a **Cattle Rancher** who own adjacent land. Cattle occasionally stray and damage the farmer's crops. Who is responsible for the crop damage?
 - Open Range?
 - Private Property?

Coase Theorem: Example

- Suppose your roommate likes to play loud music, but it disturbs you. The table below reflects your happiness under both scenarios.

	No Loud Music	Loud Music
Roommate	\$50/month	\$70/month
You	\$50/month	\$10/month

- **1. What is the socially optimal outcome?**
 - A. Your roommate plays loud music
 - B. Your roommate doesn't play loud music

Coase Theorem: Example

	No Loud Music	Loud Music
Roommate	\$50/month	\$70/month
You	\$50/month	\$10/month

- Assume your roommate has the legal right to play music. Negotiation is costless.

2. What's the maximum amount you're willing to pay your roommate to stop playing music?

Answer:

3. What's the minimum amount the roommate is willing to accept to stop playing music?

Answer:

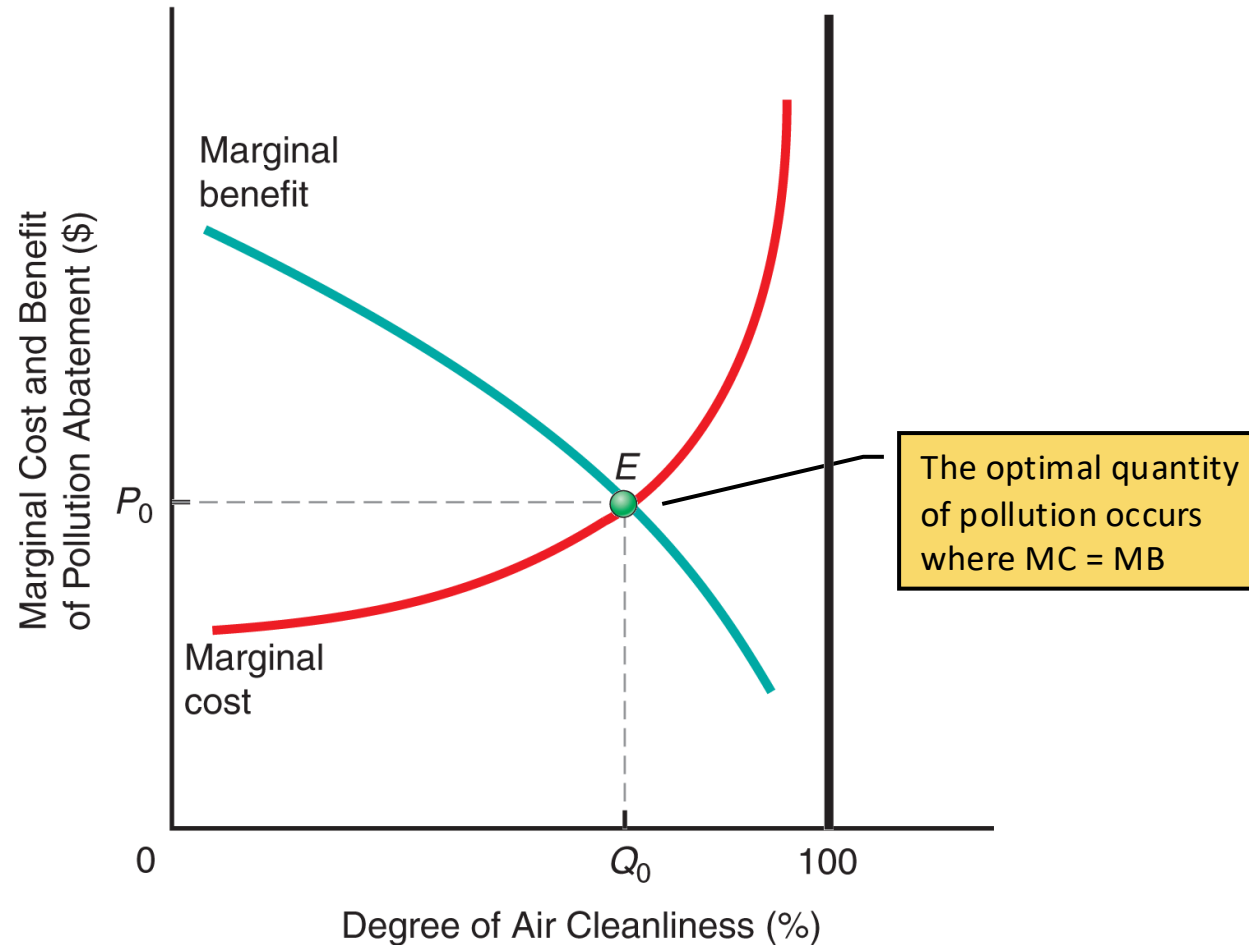
Coase Theorem: Example

	No Loud Music	Loud Music
Roommate	\$50/month	\$70/month
You	\$50/month	\$10/month

4. What's a possible solution.

Answer:

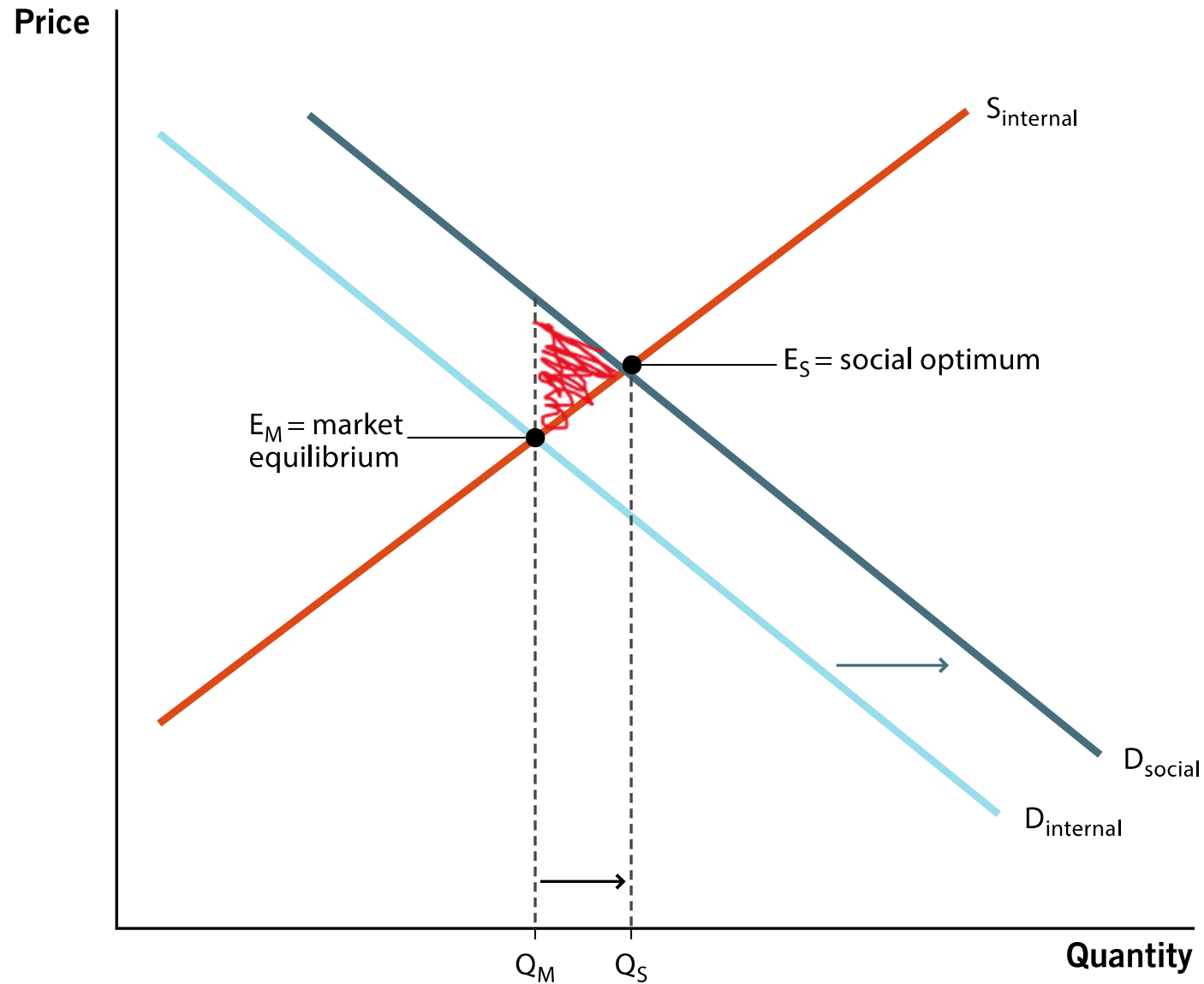
The Optimal Amount of Pollution is NOT Zero



Positive Externalities

- **Positive Externalities:** There is positive benefit to a third party from consumption or production of a good.
- Examples:
 - Technology Spillovers
 - Education
 - Planting Flowers in your yard
 - A farmer planting apple trees (creates more nectar for bee farmer, third party).
 - Medicine that prevents disease.
- All of these have a private benefit of consumption, but also an added benefit to third parties.

Correcting for Positive Externalities (subsidies)



Types of Goods

- *We define four types of goods based on two categories*
- **Nonrival goods**: the consumption of the good by one person does not preclude other people from also consuming the good.
 - The opposite of a nonrival good is a rival good
- **Nonexclusionary good**: once provided, no one can be excluded from consuming the good.
 - The opposite of a nonexclusionary good is an exclusionary good.

Four Types of Goods



Private Good

- Excludable
- Rival



Common Good

- Not Excludable
- Rival



Club Good

- Excludable
- Not Rival



Public Good

- Not Excludable
- Not Rival

Four Types of Goods: Examples:

- Asteroid Defense
- Front row spot at the beach
- Tuna in the sea
- Buying a sandwich from the café
- Watching 'A Knight of the Seven Kingdoms' on HBO
- Universal Healthcare
- The Moon

Public Goods

- A ***public good*** is another type of good that leads to a market failure.
- Public goods lead the market to provide inefficient quantities since everyone gets to consume a public good once it is available, but individuals have little incentive to purchase the good; they prefer others to pay for it.
 - When a group of individuals rely on the efforts or payments of others to provide a good, we say there is a ***free-rider*** problem.
- An example you are all familiar with....GROUP PROJECTS!

Public Goods: Example

- Imagine 3 people each have the following demand function for streetlights (how much they privately benefit).

Person A: $P_a = 30 - Q$

Person B: $P_b = 30 - Q$

Person C: $P_c = 30 - Q$

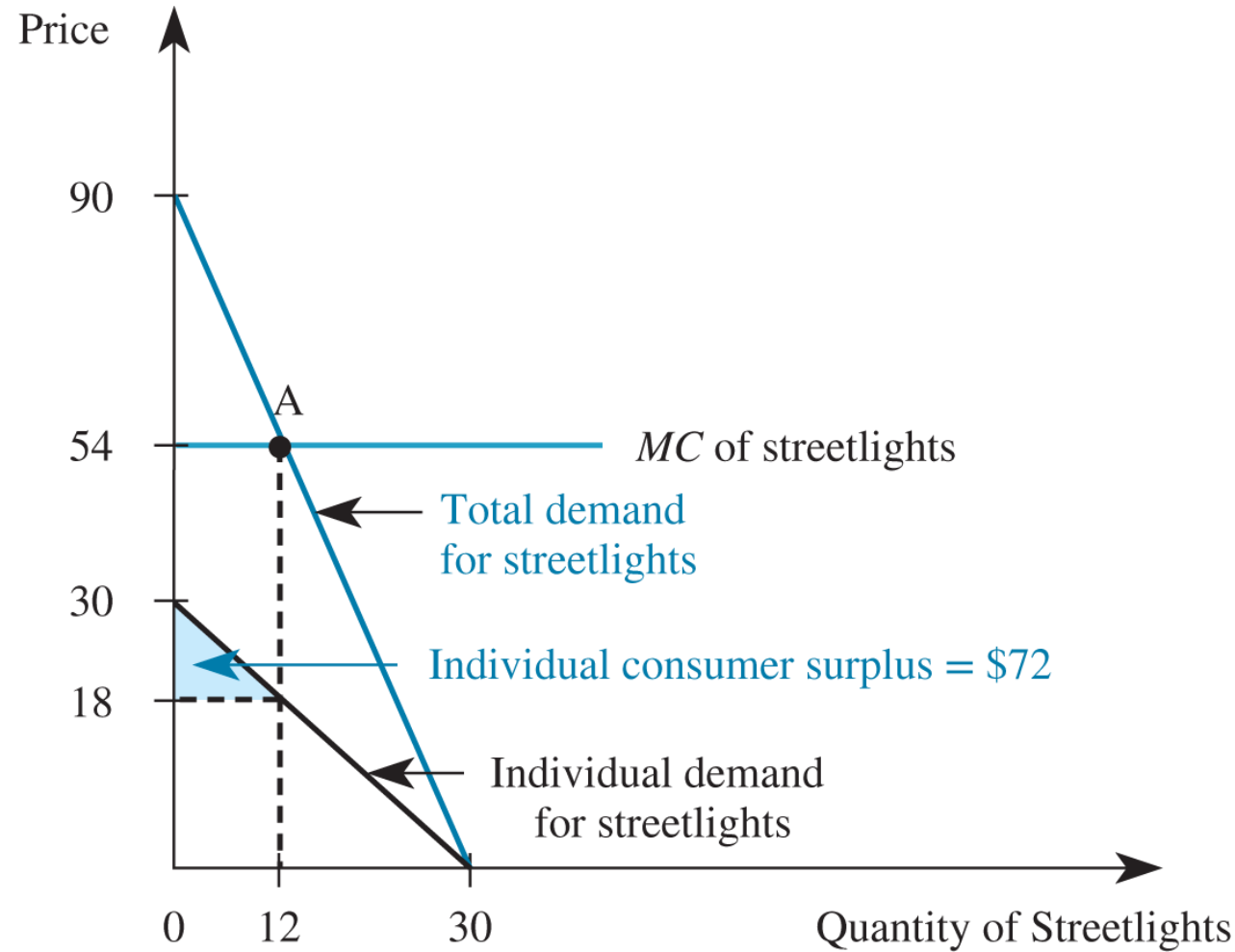
Societal Demand Function: $P = 90 - 3Q$

MC of streetlights is \$54.

Public Goods: Example

EQ at $MB=MC$

Public Goods: Example



Public Goods: Example

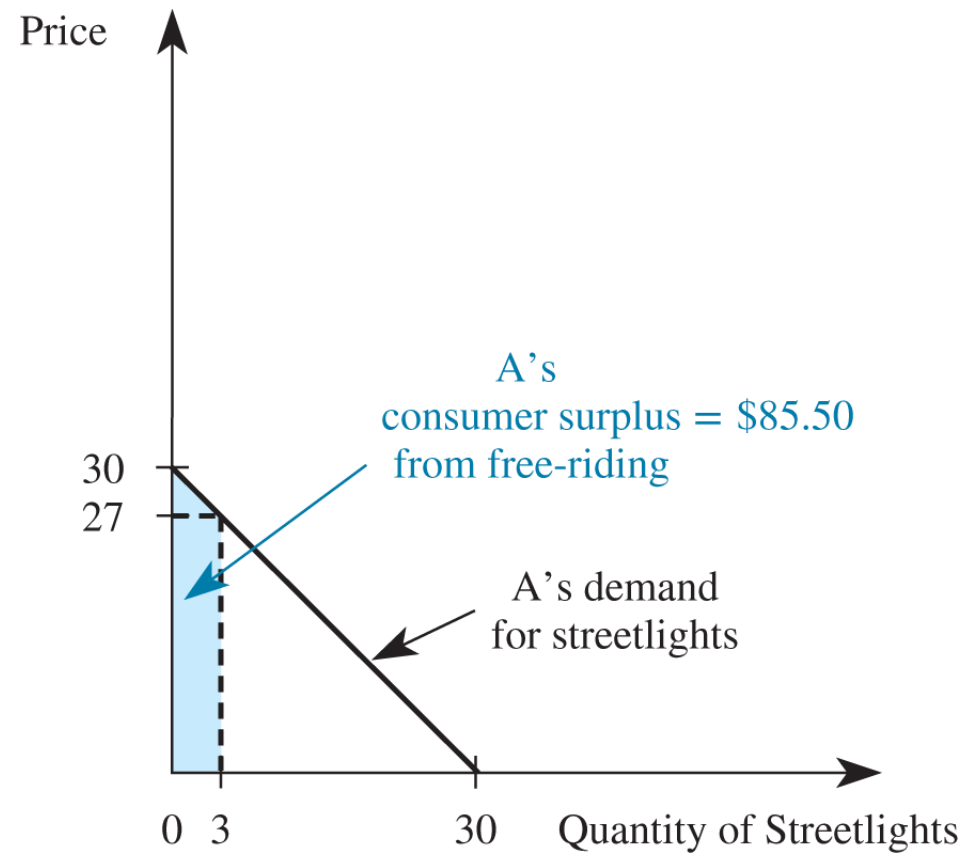
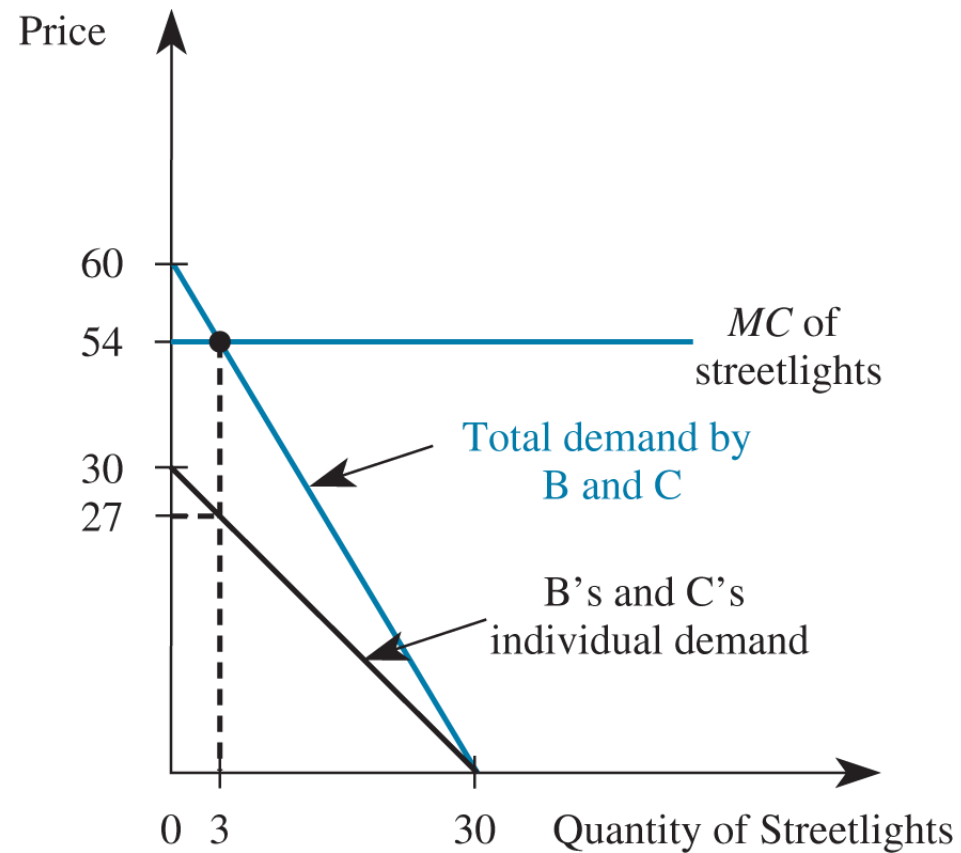
- All seems well.....but, why does Person A need to reveal their true demand function?
- What happens if they tell Person B and Person C that their Demand function is=0.
 - i.e- They don't value the streetlights at all (when in reality they do!)

Public Goods: Example

Societal Demand Function^{B+C}: $P=60-2Q$

MC of streetlights is \$54.

Public Goods: Example



Public Goods: Example

- Player A does better when they 'lie' about their demand function=0 (\$85.5 > \$72).
- This means each individual is better off by lying/not contributing to the public good.
- This means the optimal strategy of each player is to contribute \$0, and there are no streetlights!
 - No one will individually pay since the $MC > MB$ for a single individual

Public Goods: Example

- A key role of government is to help solve this ‘free rider’ problem by collecting taxes and using it to fund public goods (Health, Education, Army, Roads, Infrastructure etc) .
 - **Note 1:** There are other mechanisms proposed to fund public goods (Quadratic Scoring rule, Vickery-Clark-Grove mechanism etc).
 - **Note 2:** Gov may overprovide PGs, since people can still lie about how much they value it!
 - **Note 3:** This makes it really, really, really hard to solve global public goods (Paris Agreement/Kyoto Protocol are not great solutions).

Public Goods: One more note of interest

- The streetlight example is known as a linear public good, since as funds increase, there is always more benefit that can be received from extra street lights.
 - Total benefit increases for each extra street light.
- There is another type of Public Good, known as the threshold public good. It either exists or it doesn't (consider production of a singular bridge). If the threshold is hit (e.g 1 bil, then the bridge is built) less than 1 bil, it is not built.
- For Threshold Public Goods, there are multiple equilibria (will discuss more in game theory)...but in short
 - If no one is funding, your best course of action is not to fund
 - If everyone is paying their equal share, your best course of action is to pay your equal share to hit the threshold!

Incomplete Information

- Efficiently functioning markets require participants to have reasonably good information about prices, quality, available technologies, and the risks associated with working certain jobs or consuming certain products.
 - Market inefficiencies result when participants have *incomplete information*.
 - Example: Pitt Market without prices yelled out
- One severe source of market failure is *asymmetric information*, where some market participants have better information than others.
 - Implication: buyers may refuse to purchase from sellers.

Incomplete Information

- A famous example is Akerlof's 'Market for Lemons' paper in 1970.
 - This leads to Adverse Selection, which we will discuss more later in the semester.
- Consider a second-hand car market.
 - The sellers are better informed than buyers about the quality of the care. They know if it is a lemon or the quality advertised.
 - Buyers lack information. They won't pay full price (will pay average price).
 - This is good for lemon seller, and bad for 'quality car' seller.
 - Quality car sellers start to leave the market
 - Average price Buyer offers now decreases.
 - This process continues until only lemons left.

Incomplete Information

- The government have enforced several rules and regulations to mitigate incomplete information problems.
- Rules against insider trading
- Certification
- Truth in lending
- Truth in advertising
- Enforcing contracts