

# Essentials of Economics

## Chapter 2: Coase theorem

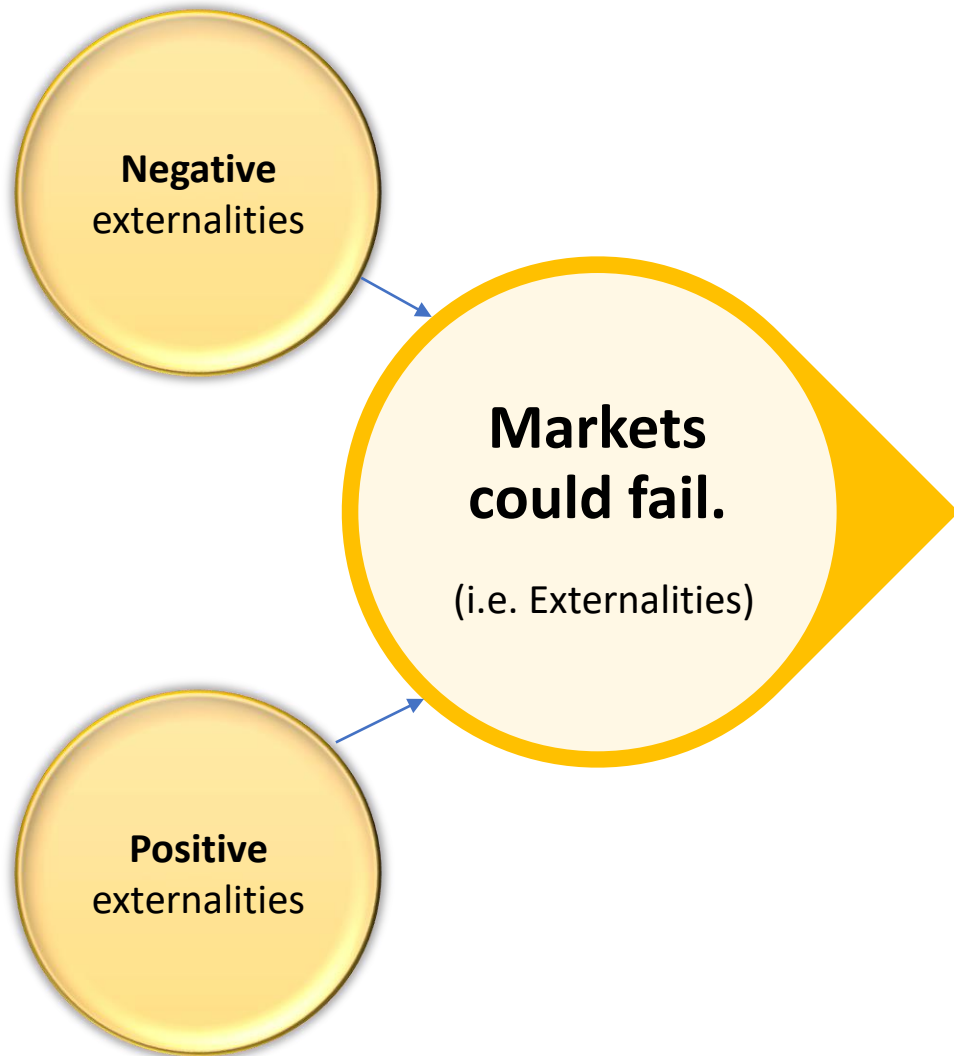
Essentials of Economics

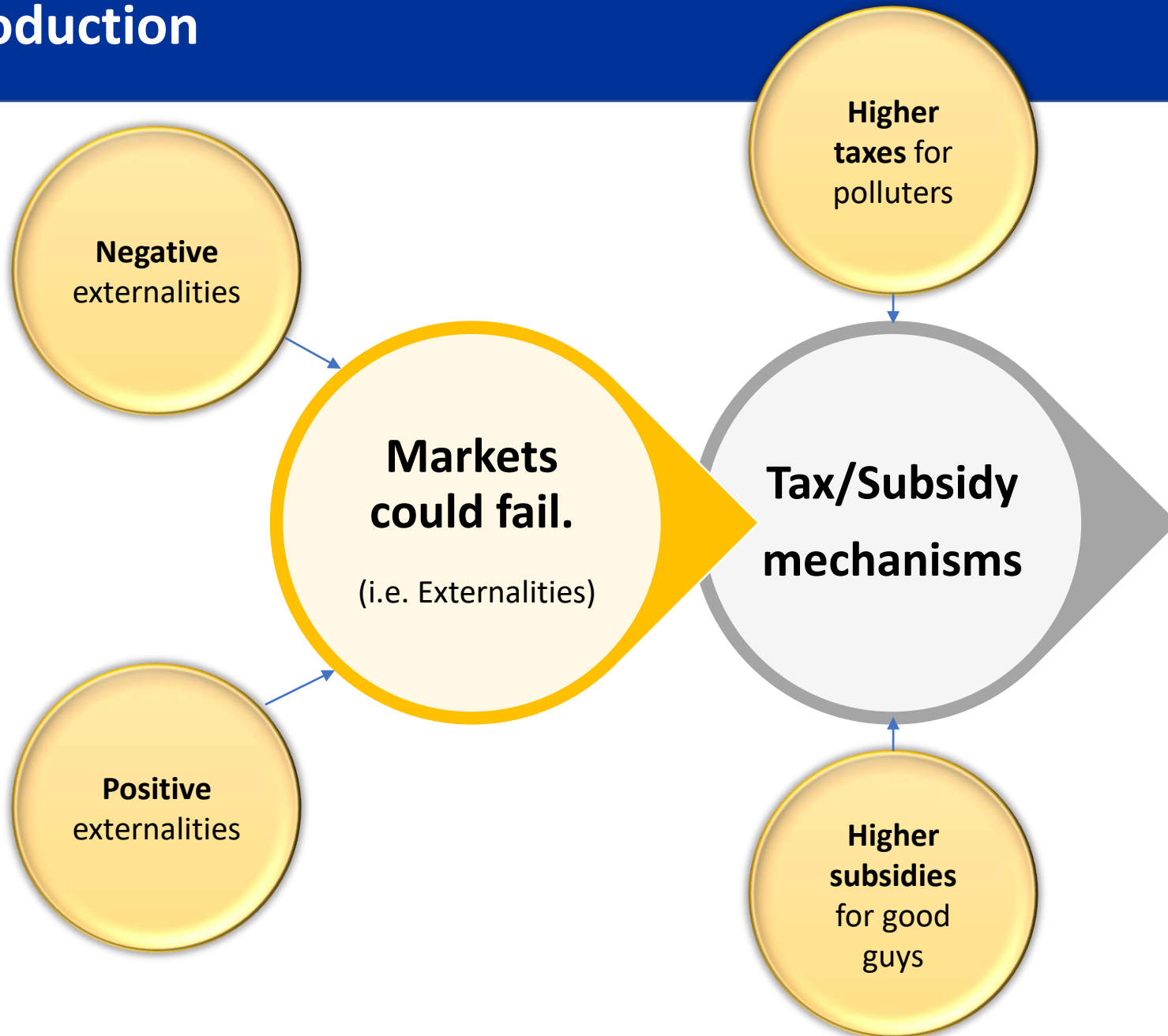
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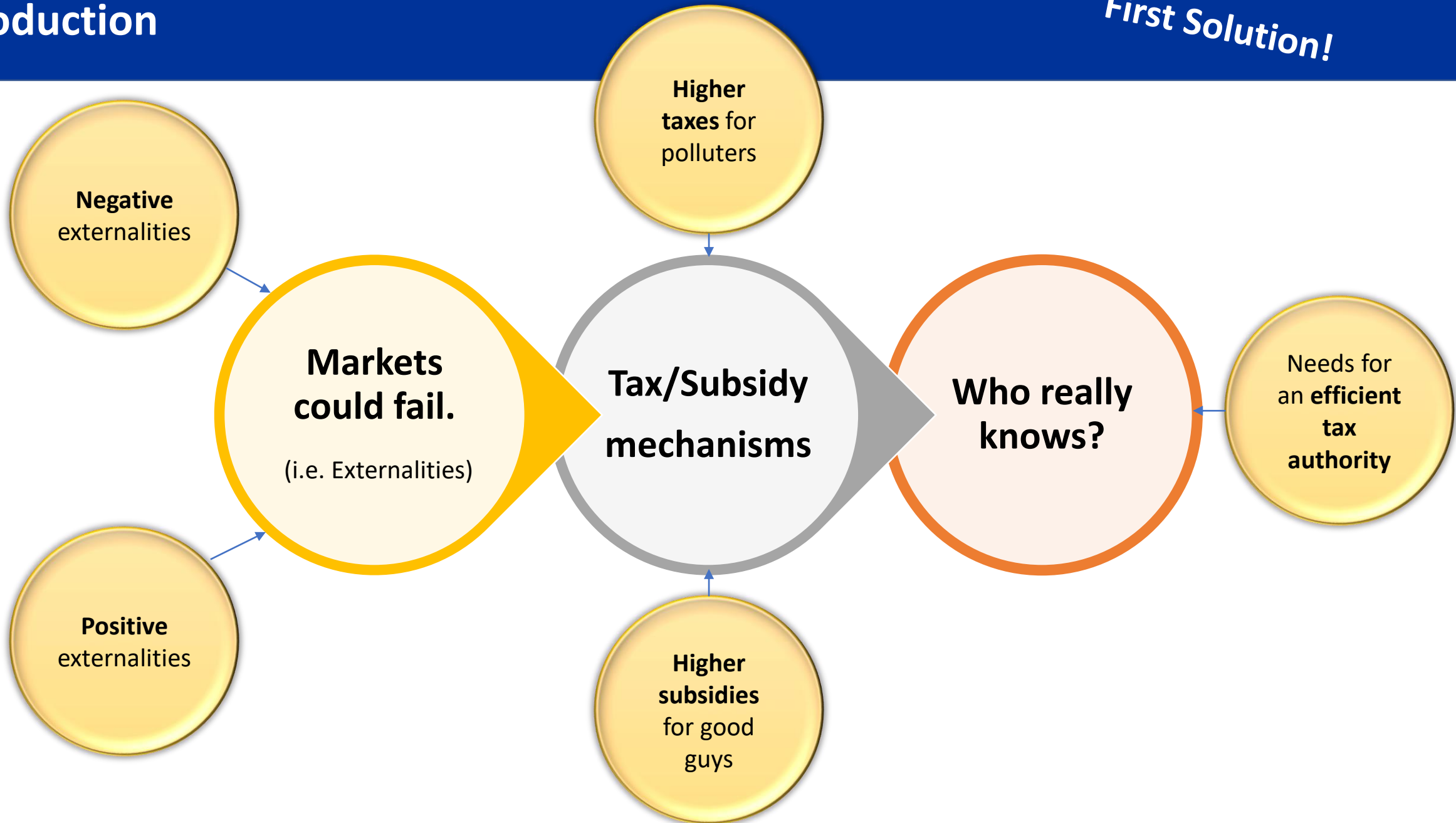
Winter Term            2023-24

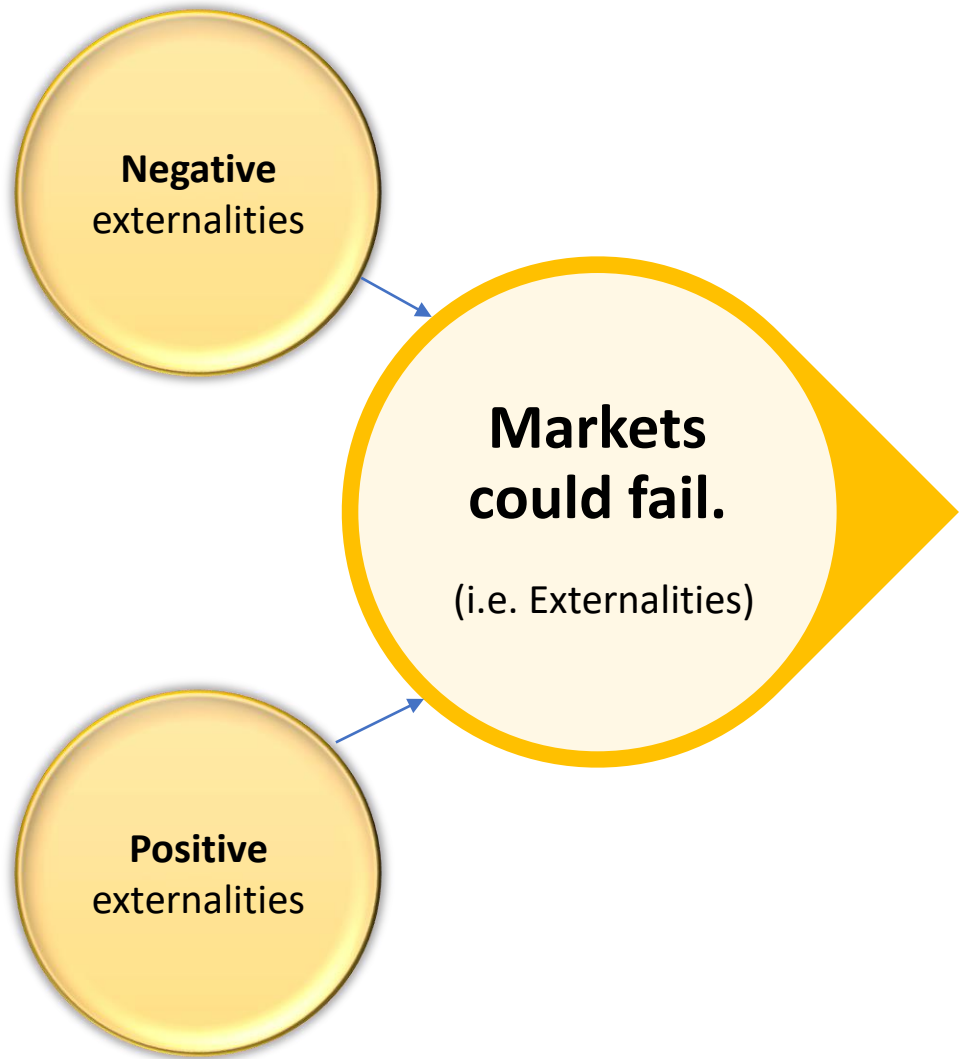


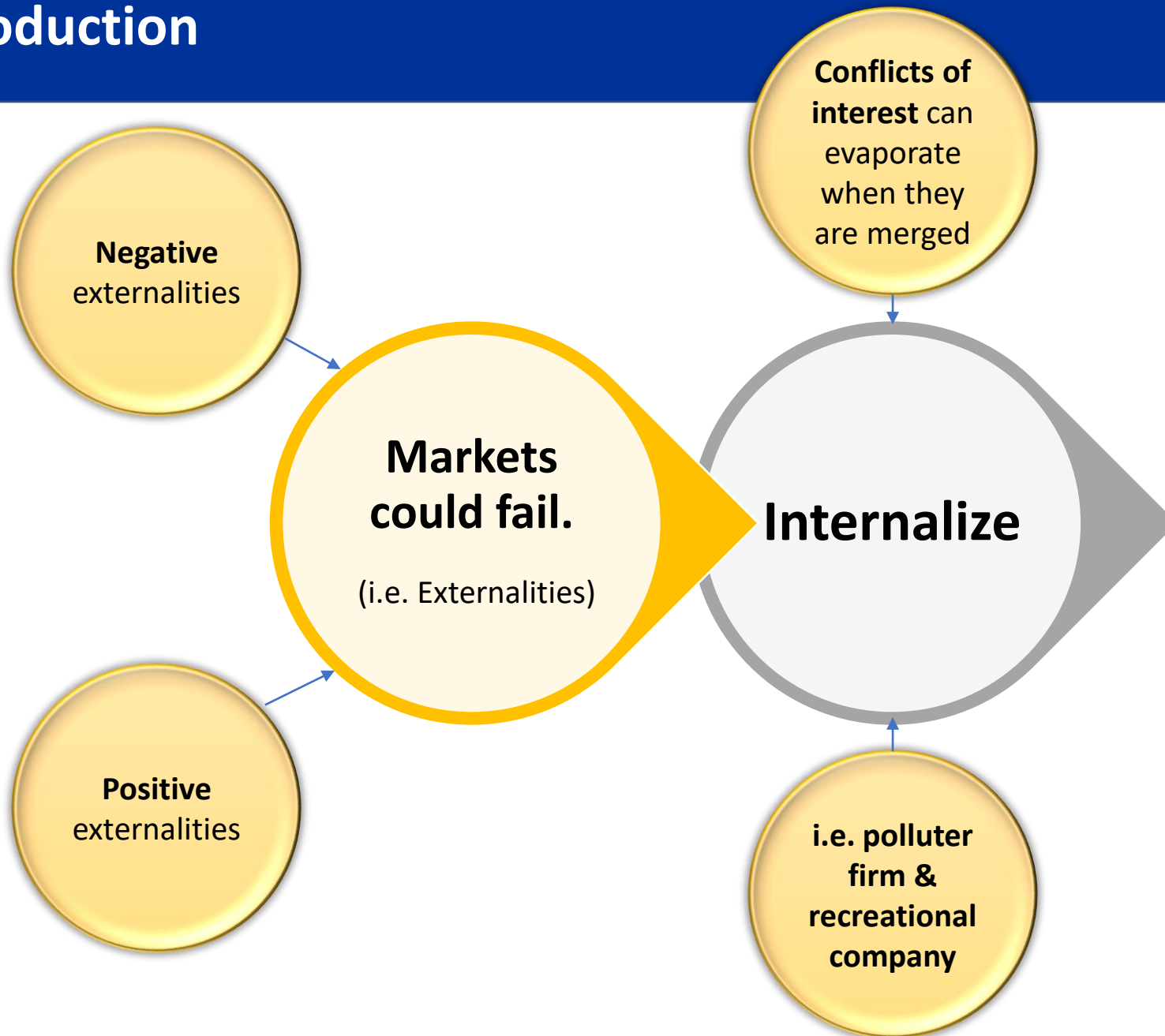




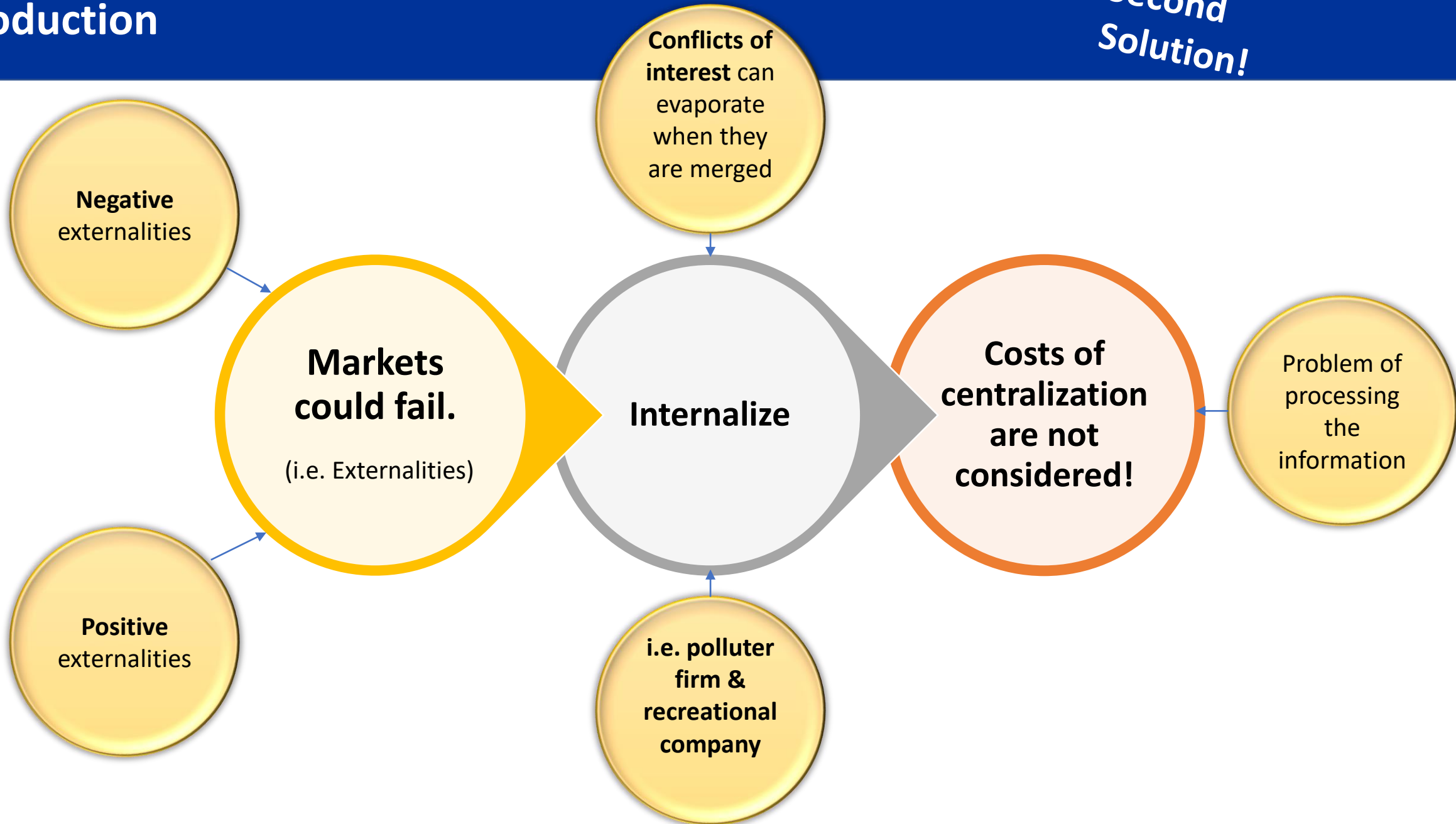








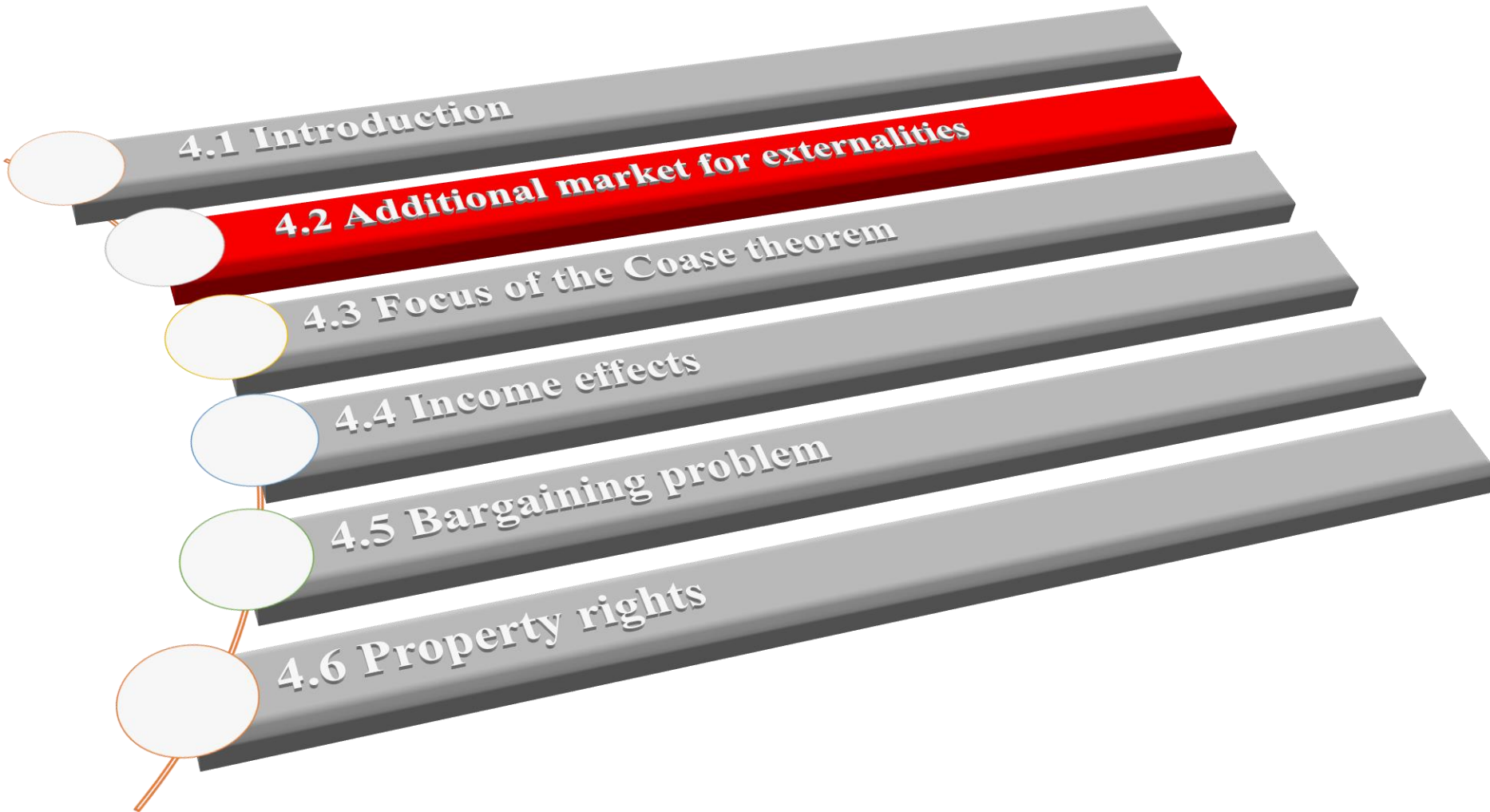




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Yeah, this chapter 😊



## 4.2 Additional market for externalities

- A basic problem with externalities is the wrong allocation of **ownership rights**.
- There is often a discrepancy between a range of activities and the legal responsibility for the effects of activities.
- Coase (1960) suggests a third way: The creation of **a market for externalities** in which ownership rights have to be traded.
- The problem with externalities is: **Who pays for the costs?**

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## 4.2 Additional market for externalities

### ❖ Local residents pay

- Ownership rights possessed by the polluting firm
- Residents pay the firm to give up production

### ❖ Firm pays

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- The firm can pay to compensate the local residents for the damage suffered.

What happens if the **ownership of rights** did not determine?

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Assume that the **decision rights** regarding pollution have **not been determined**

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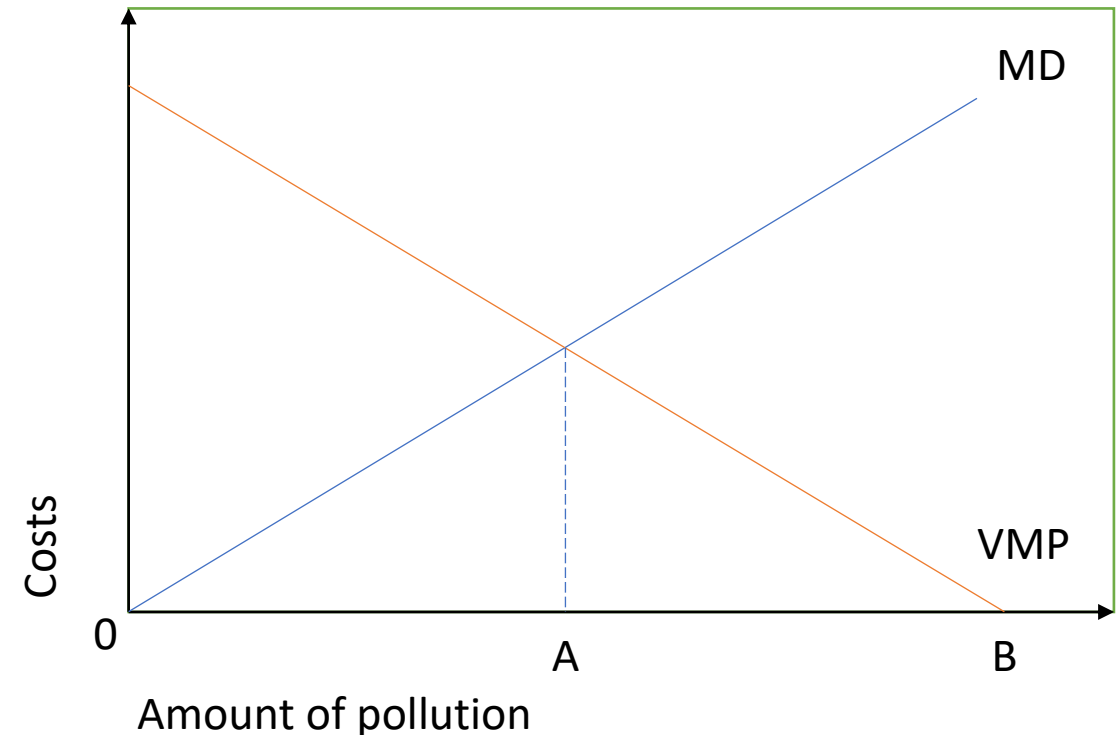
Value of one marginal unit of pollution of the firm = **VMP**

Marginal damage of the local resident = **MD**

**In other words:**

**VMP** represents how much the firm is willing to pay to get rid of the garbage, i.e. the **reservation price of pollution**.

**MD** represents how much the residents are willing to pay to get rid of pollution, i.e. the **reservation price of damage**.

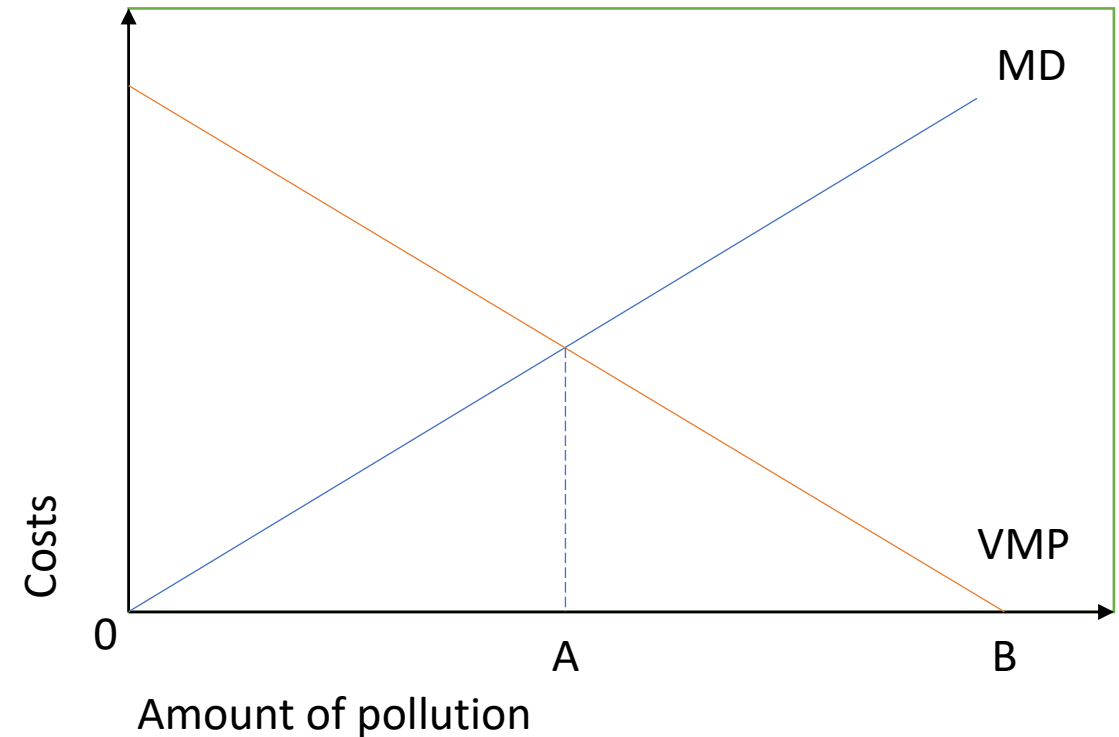


## 4.2 Additional market for externalities

- If **no pollution rights have been determined**, then the firm will dump **B** units of pollution in the lake.
- Then the costs for the firm of dumping are **zero**, whereas the profits are represented by **VMP**.

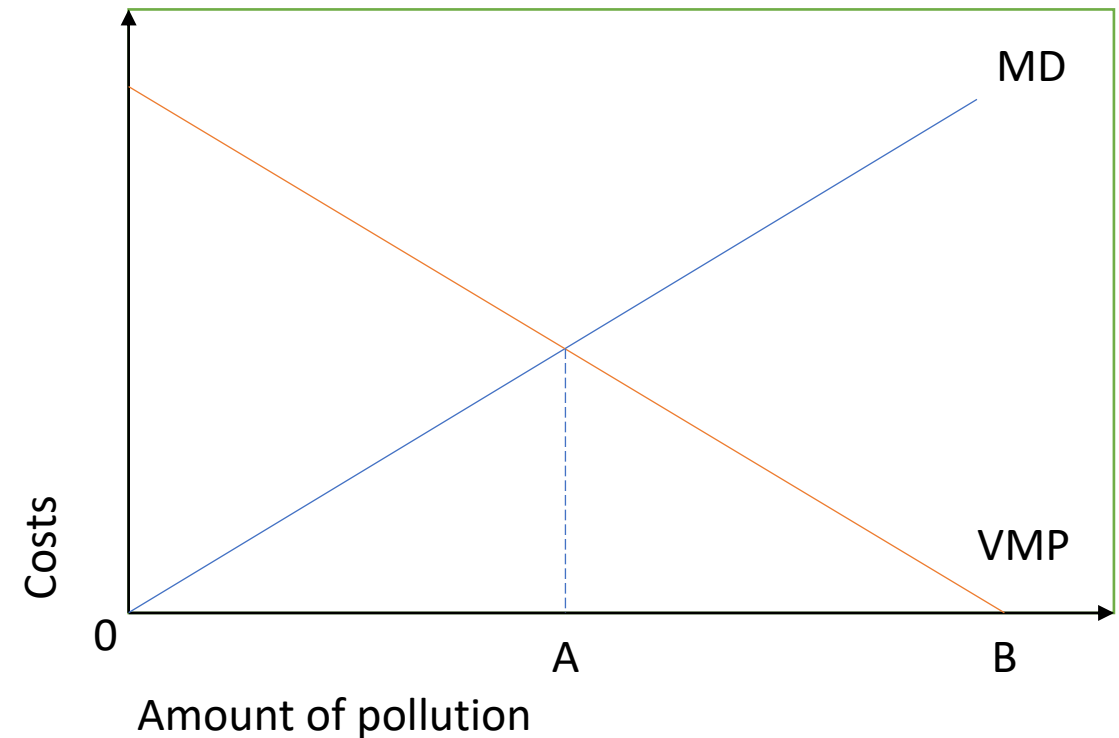
**Assume:** pollution rights have been determined and there is a market in which the ownership rights can be traded.

**Suppose:** the firm owns the pollution rights:



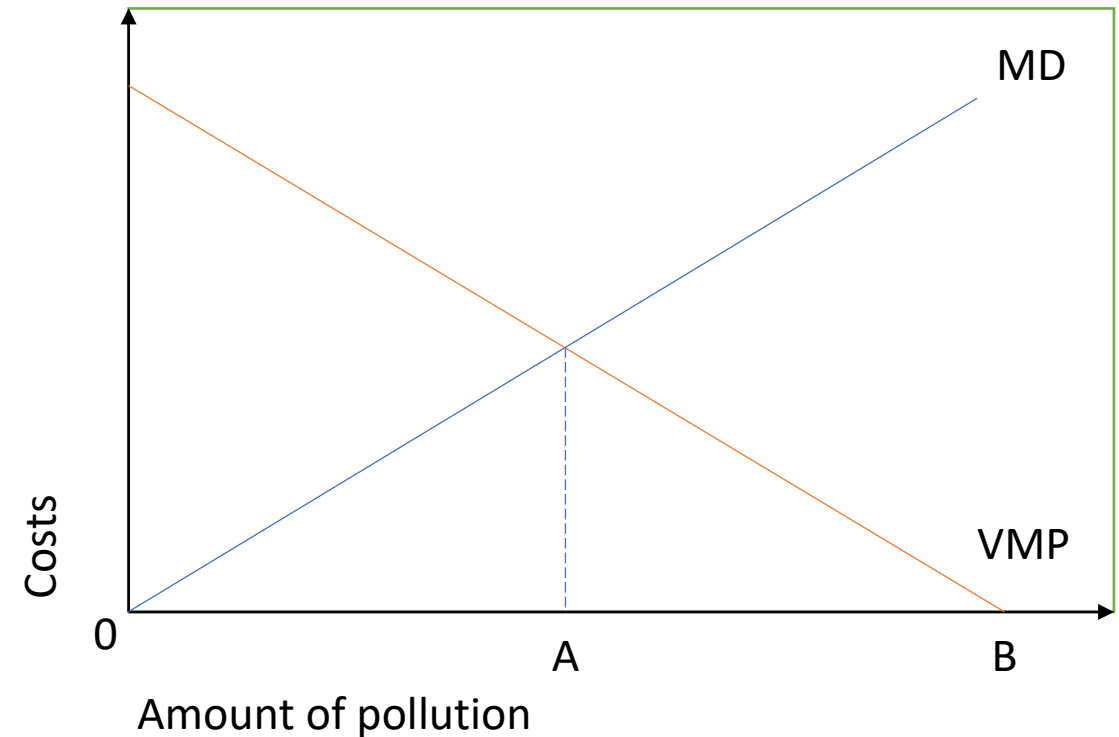
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- The firm has the right to dump **B** units of pollution in the lake.
- However, this is not what the firm will do.
- The locals are willing to pay the firm to reduce the pollution from **B** to **A**. Since for every unit between **A** & **B** it holds that  $MD > VMP$ .
- Both parties profit from this outcome.
- The amount of pollution will not be less than **A**. Since, after that  $VMP > MD$ .
- Point **A** is the efficient first-best point for pollution.
- **Suppose:** the local residents owns the pollution rights:



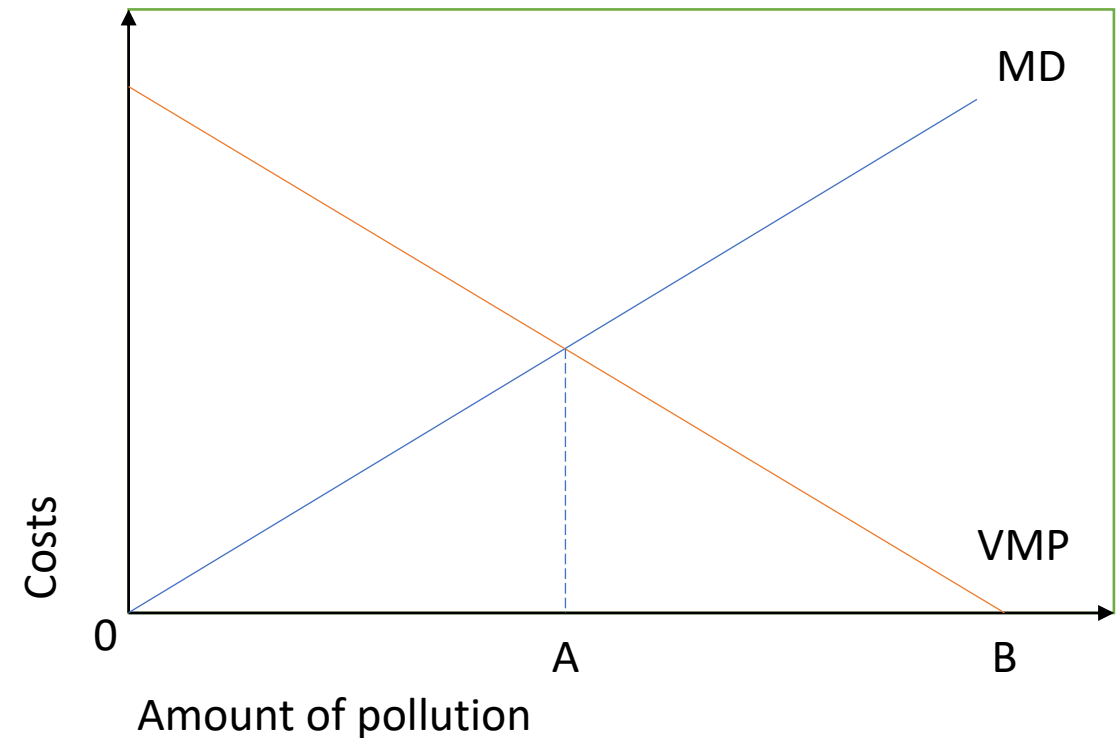
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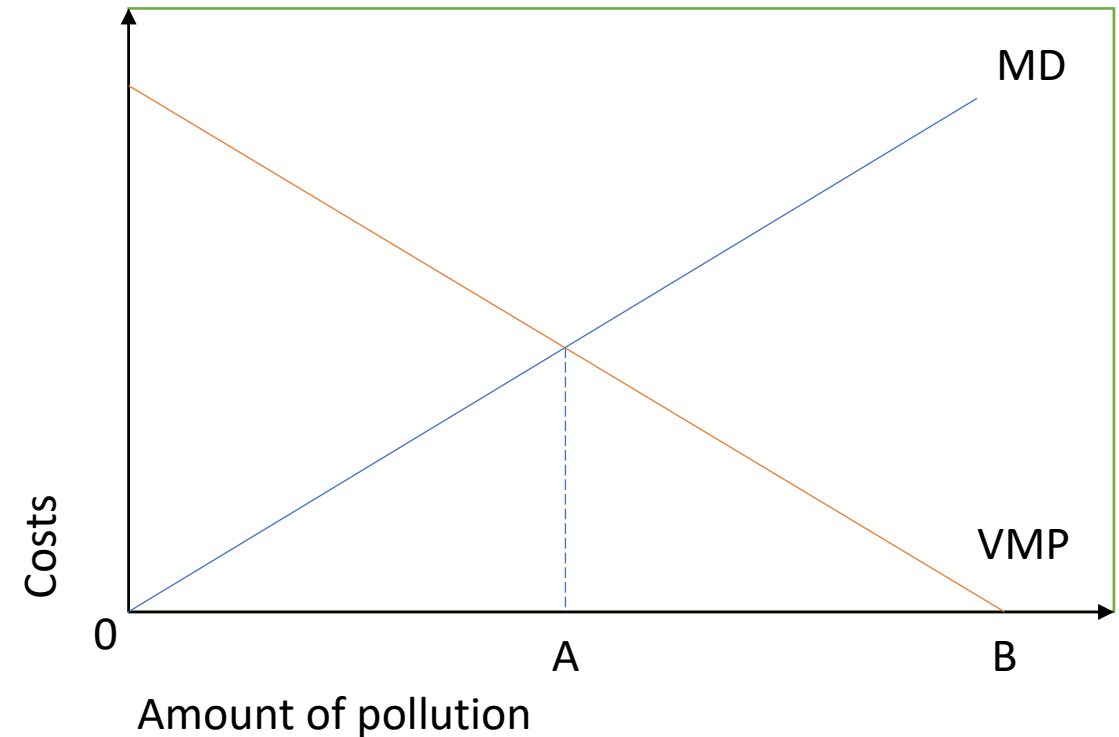
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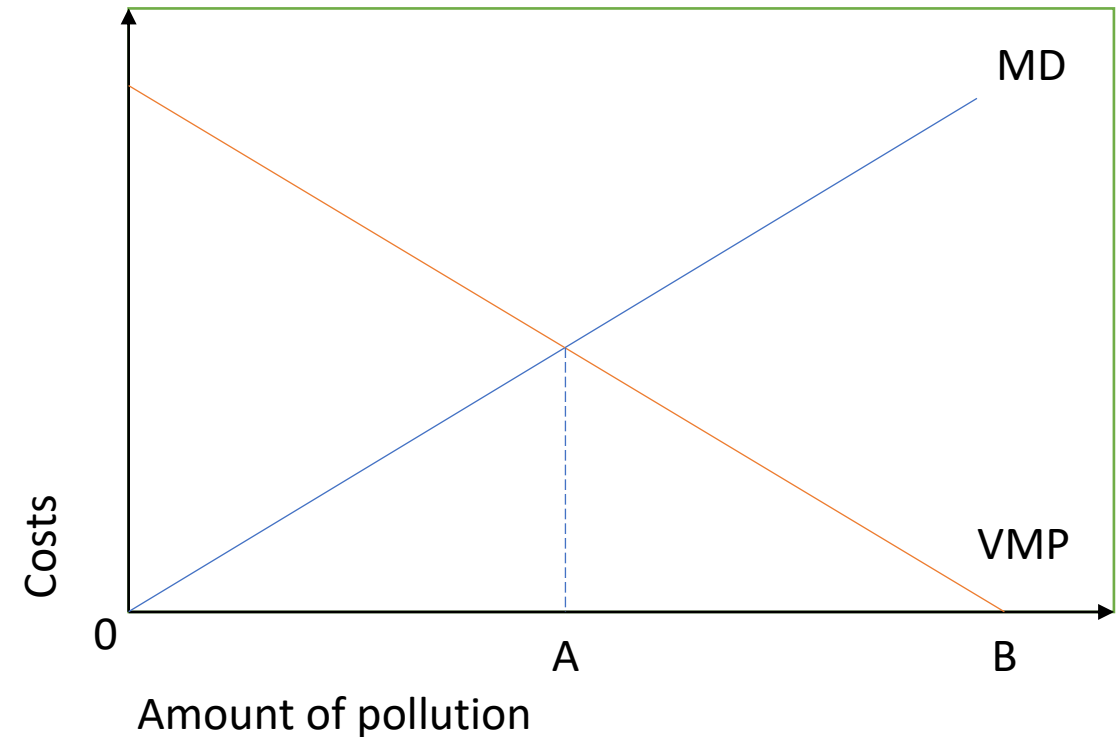
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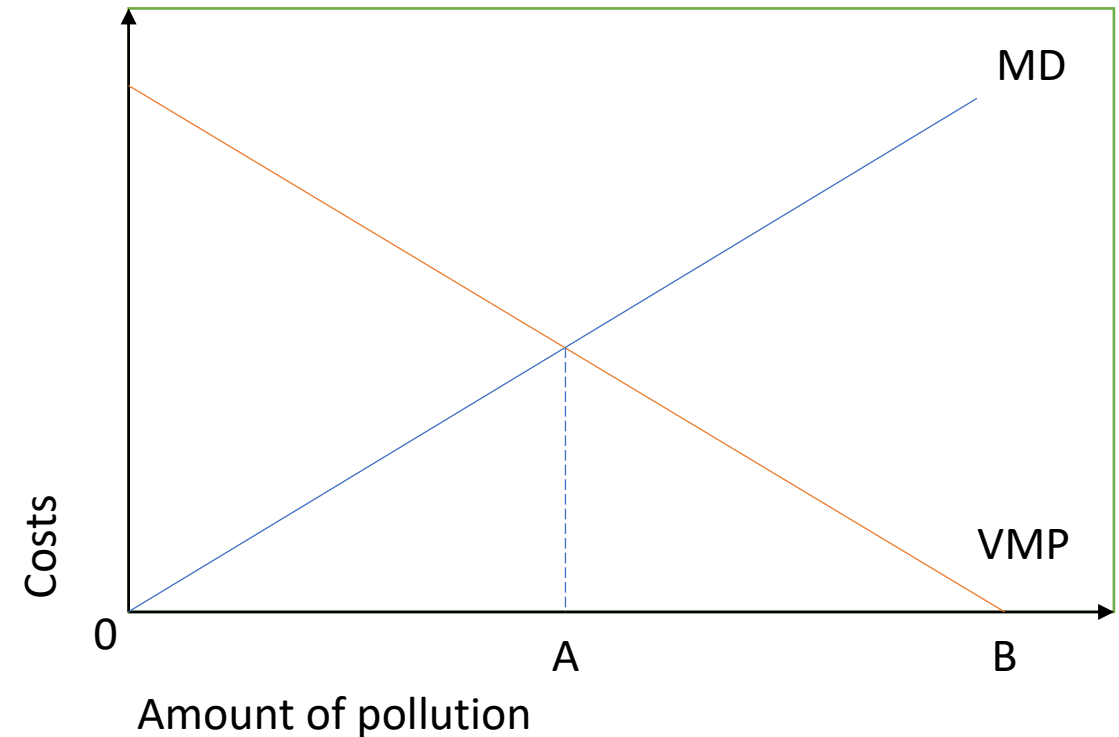
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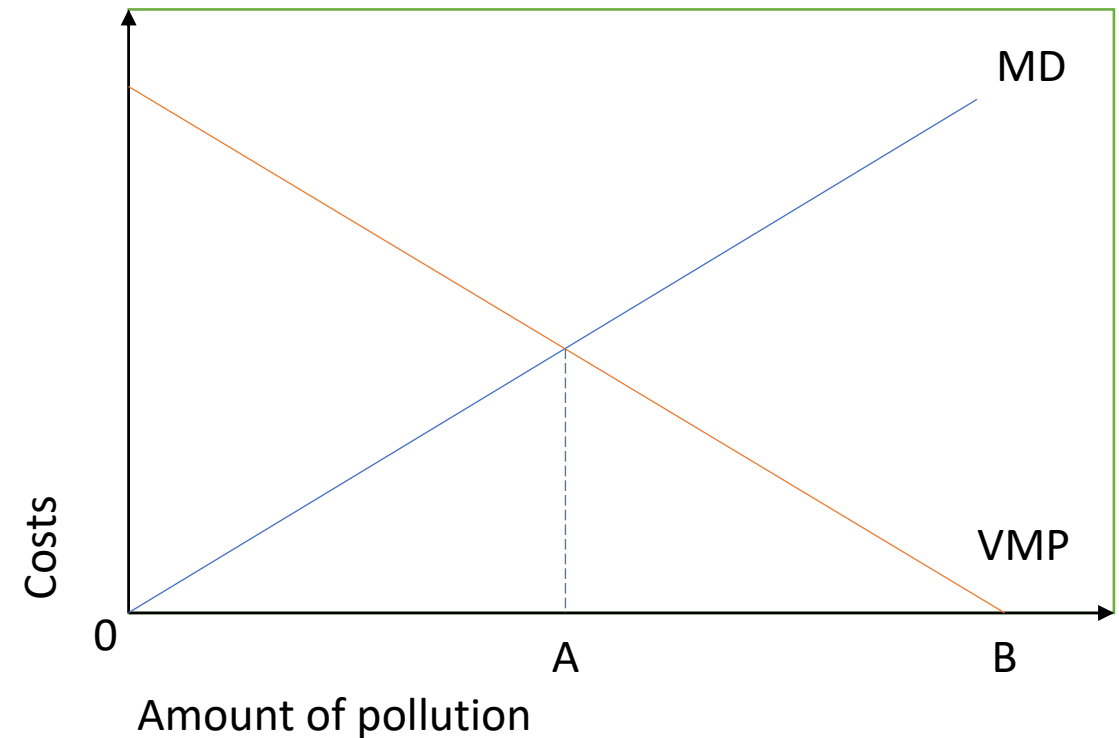
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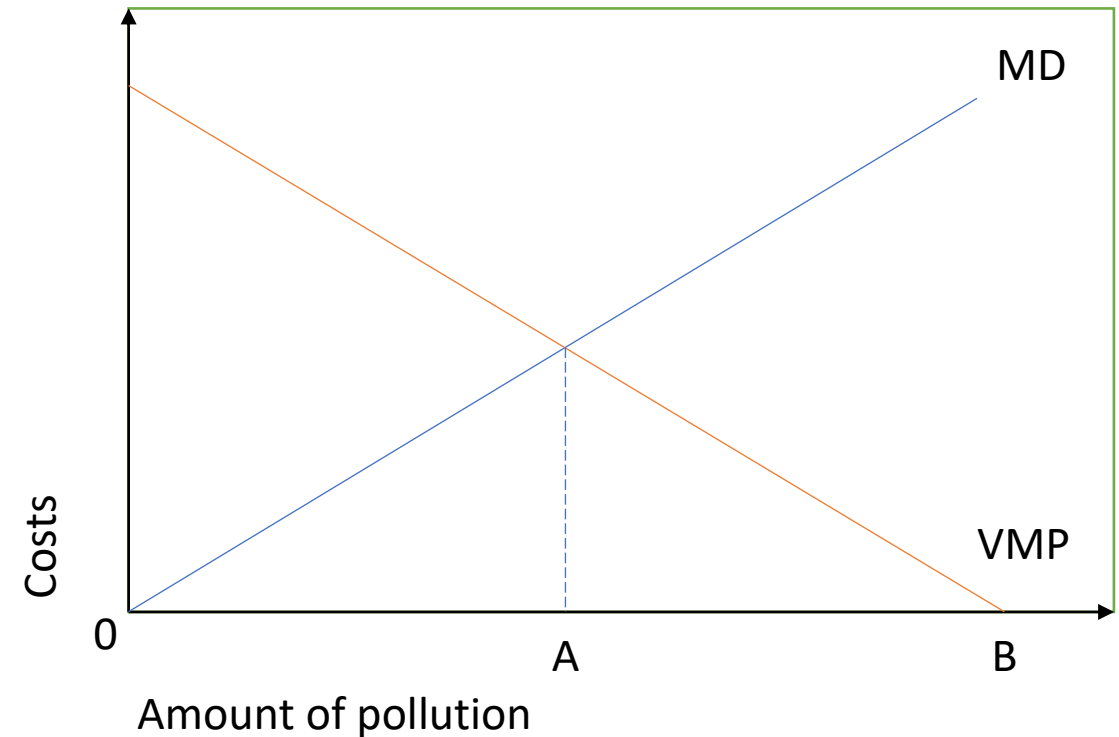
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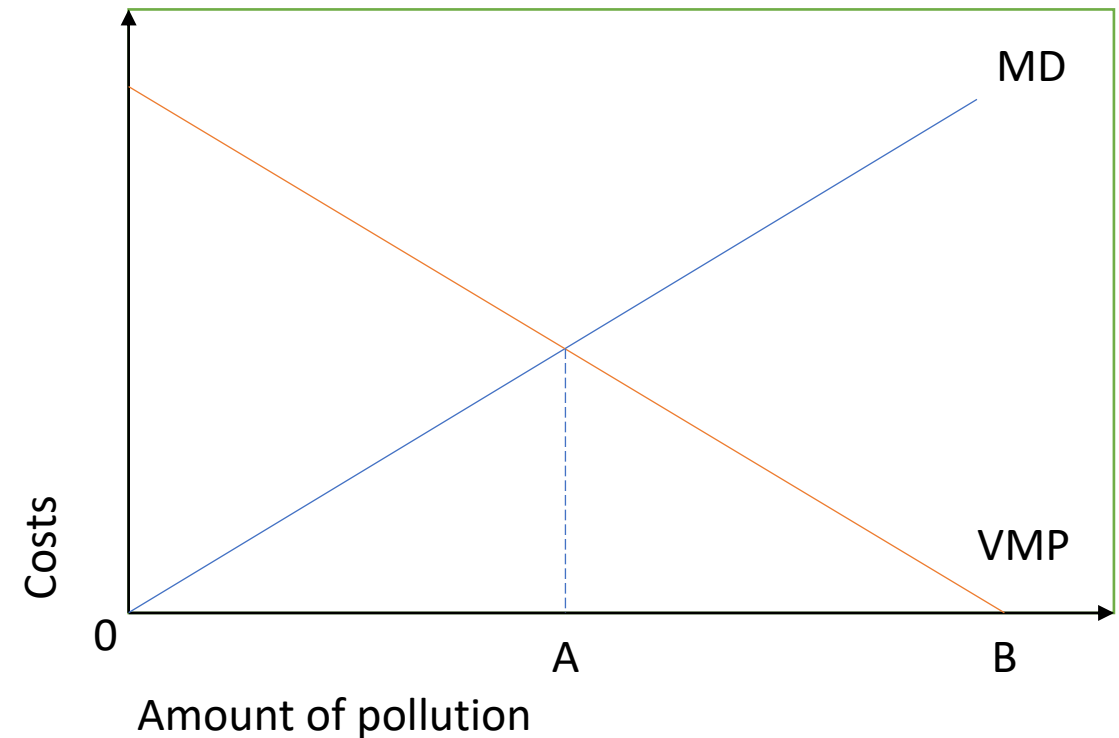
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- They can therefore stop all the pollution of the lake.
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- Again negotiations regarding the pollution rights stop when **A** units of pollution have been traded.
- This is again the **first-best** situation.



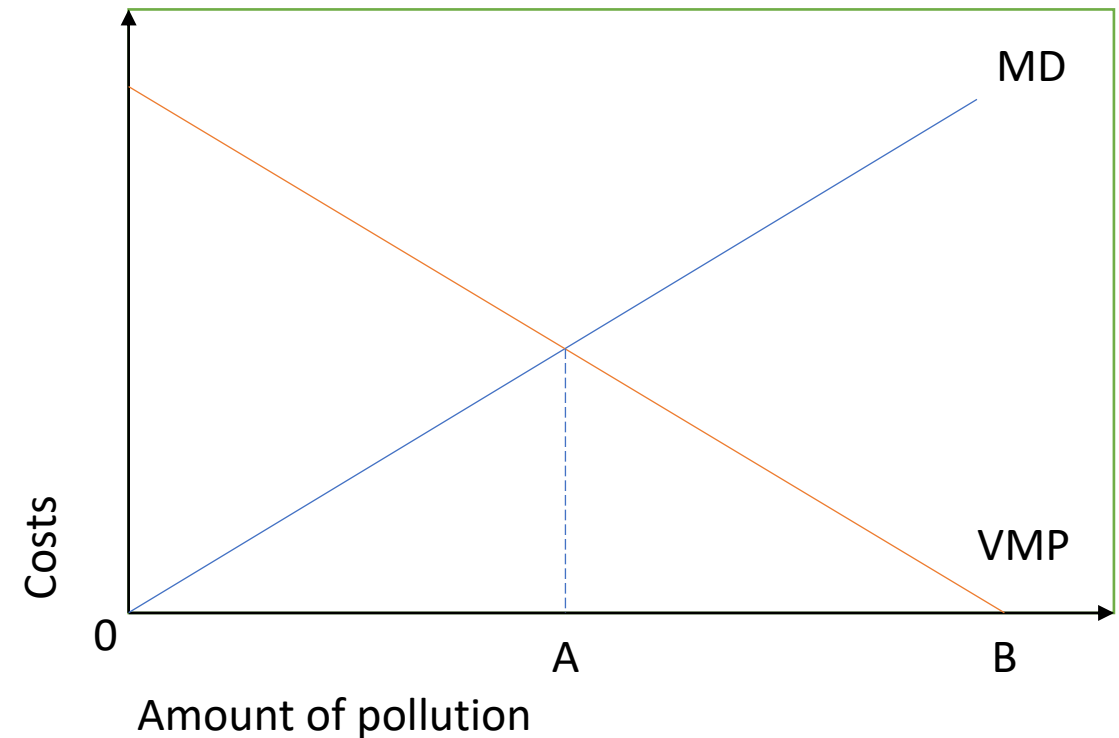
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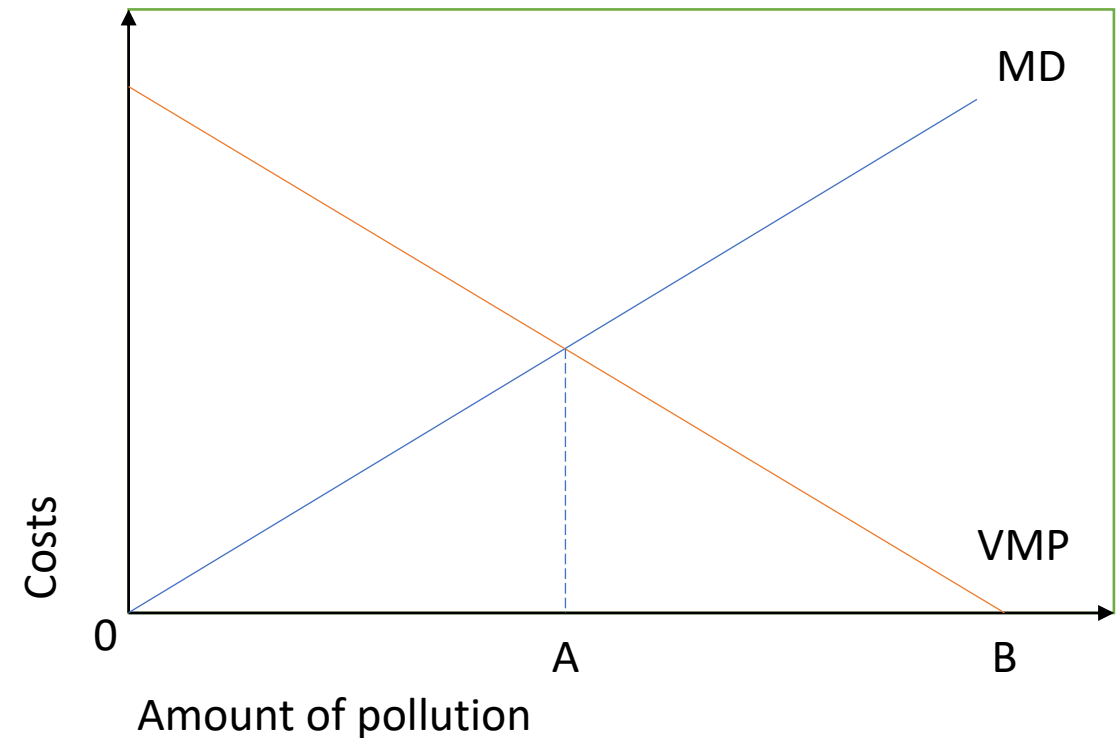
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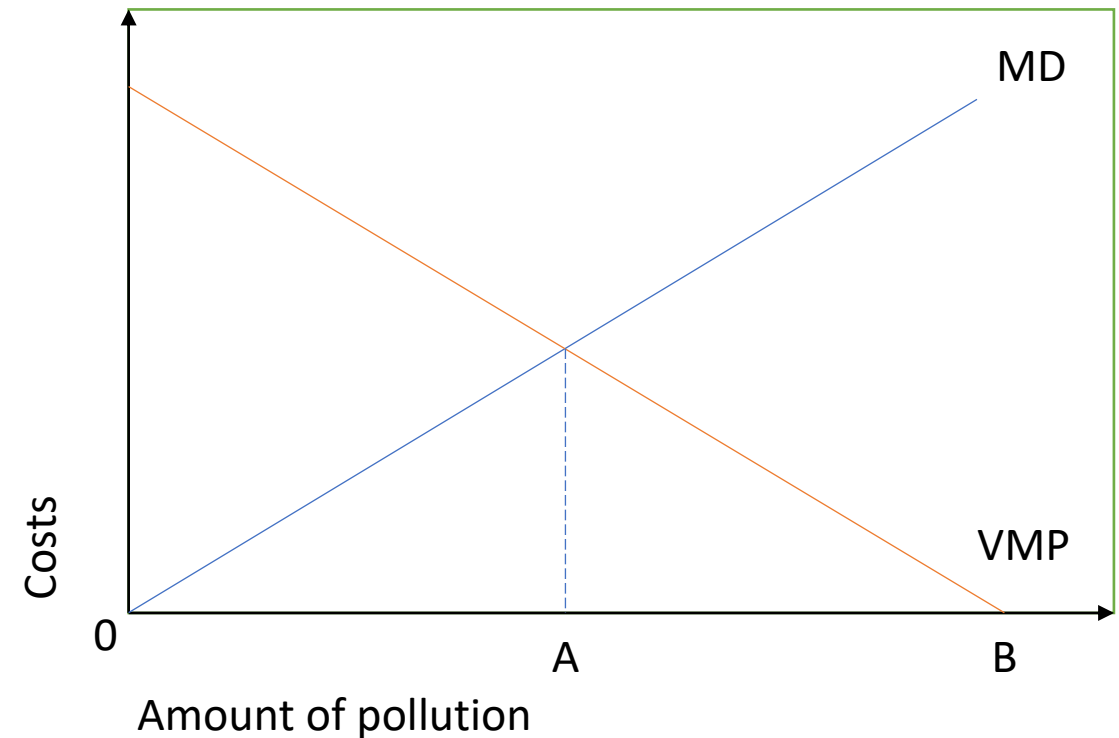
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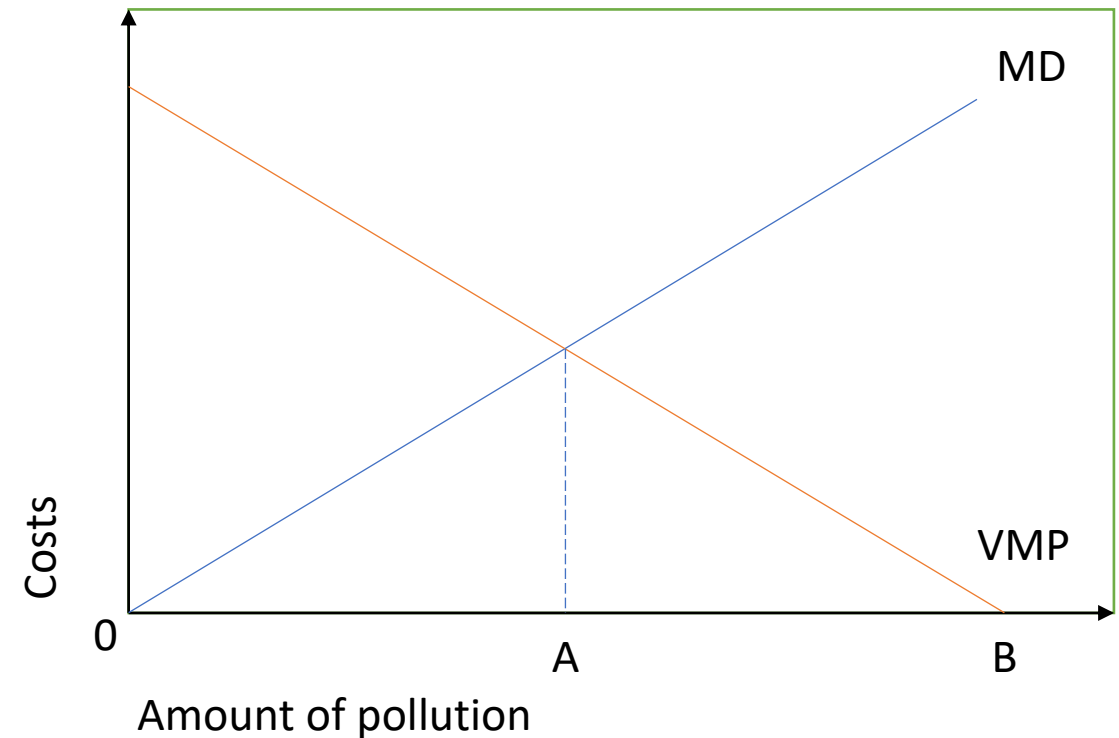
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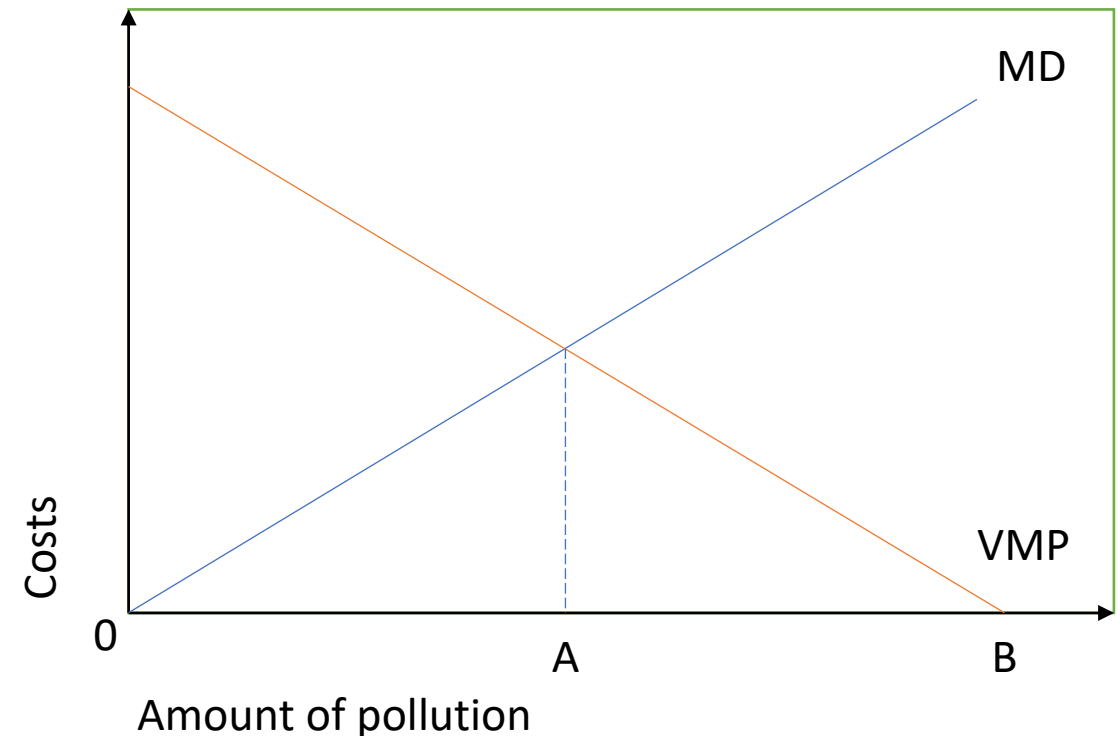
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## 4.2 Additional market for externalities

### ❖ Coase theorem (1960)

If:

1. Property rights are defined, allocated, and enforced
2. Bargaining is efficient

Then:

Every allocation of property rights in externalities will result in a **Pareto-efficient** allocation.

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- **Bargaining** determines the **division** of the surplus generated by the activities of the players.
- The **assumption of efficient bargaining** means there are **no problems in realizing** the creation of the maximum value.
- The bargaining power **affects only** the division of **costs and benefits** and not the **size**.
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McKelvey & Page (1999) presented the Coase theorem graphically

Assume:

$x$  = the amount of pollution produced by the firm

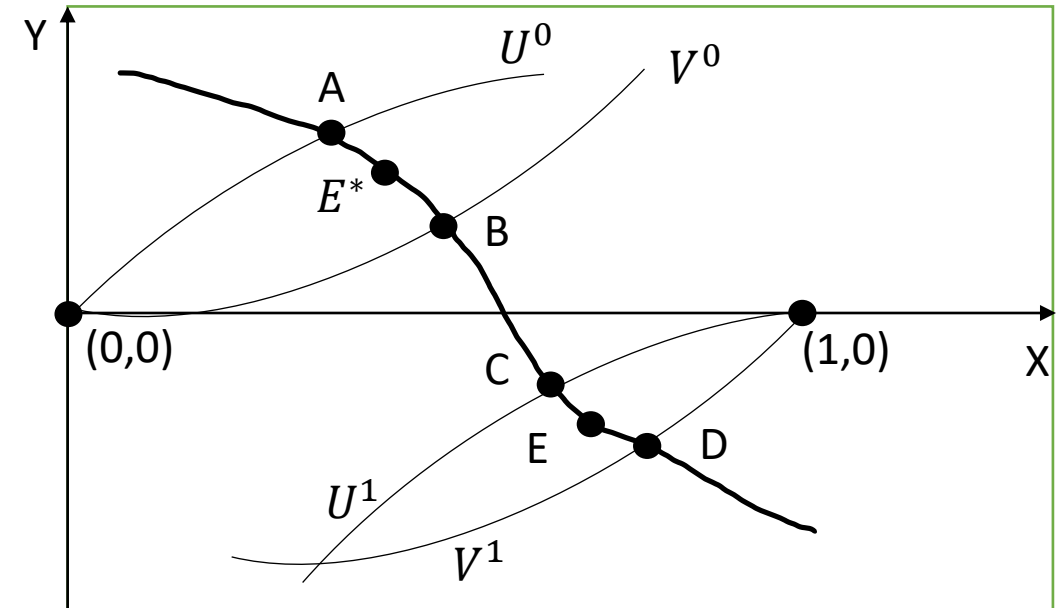
Where,  $x$  is between 0 & 1

$y$  = the payment to the residents

Where  $y$  can be positive (payment from firm to residents) or negative ( payment from residents to firm)

Suppose:

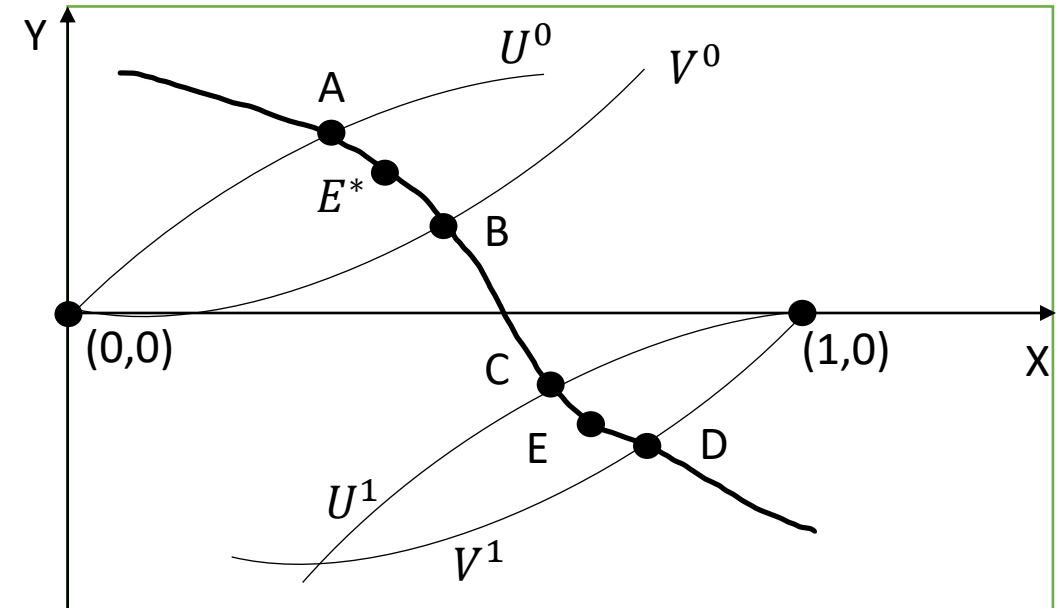
Combination  $(x,y)$  is valued at  $u(x,y)$  by the firm & valued at  $v(x,y)$  by the residents (as the utility).



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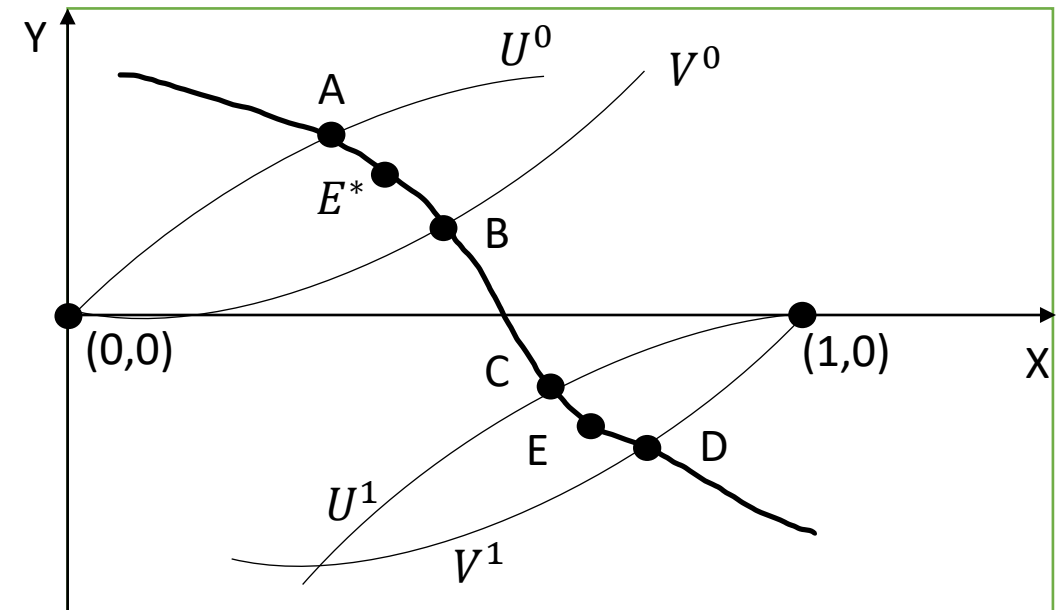
- A party has property rights when it is allowed to choose the value of  $x$  when no agreement is reached.
- If the **firm** has the rights and **no bargaining** happened, then the value of  $y$  will be **zero**, and the level of  $x$  which maximizes the  $u(x,y)$  will be  $x=1$  (or  $u(1,0)$  )
- When the **firm** has the rights and **efficient bargaining** happens then **E** will select.



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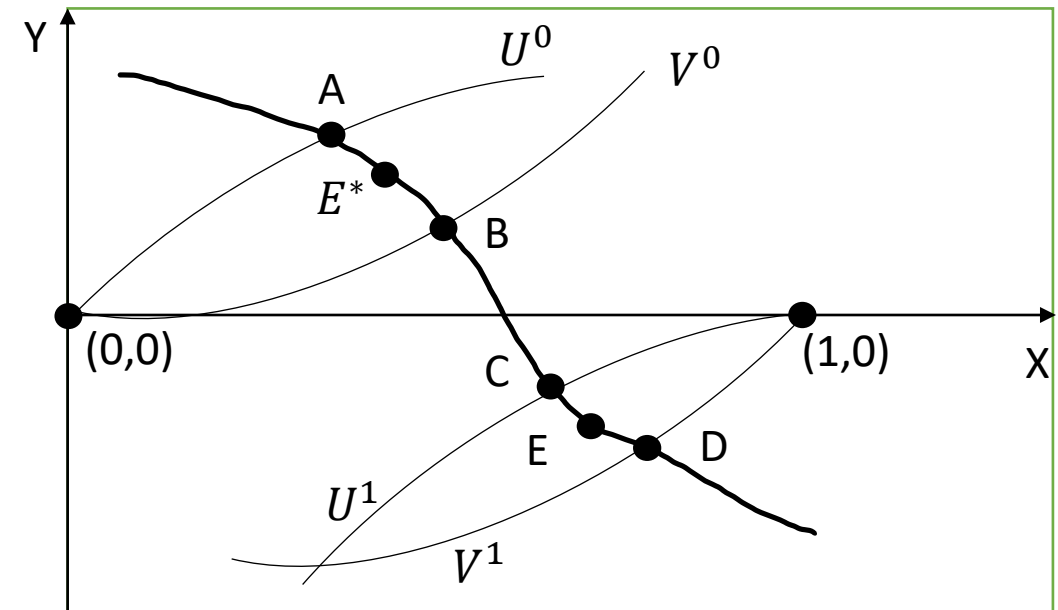
- If the **residents** have the right and **no bargaining** happened, then nobody pays ( $y = 0$ ), and residents maximize the  $v(x,0)$  in which the value of  $x$  will be zero (or  $v(0,0)$ )
- The In case of rights by **residents** and an **efficient bargaining** the efficient allocation will be in  $E^*$



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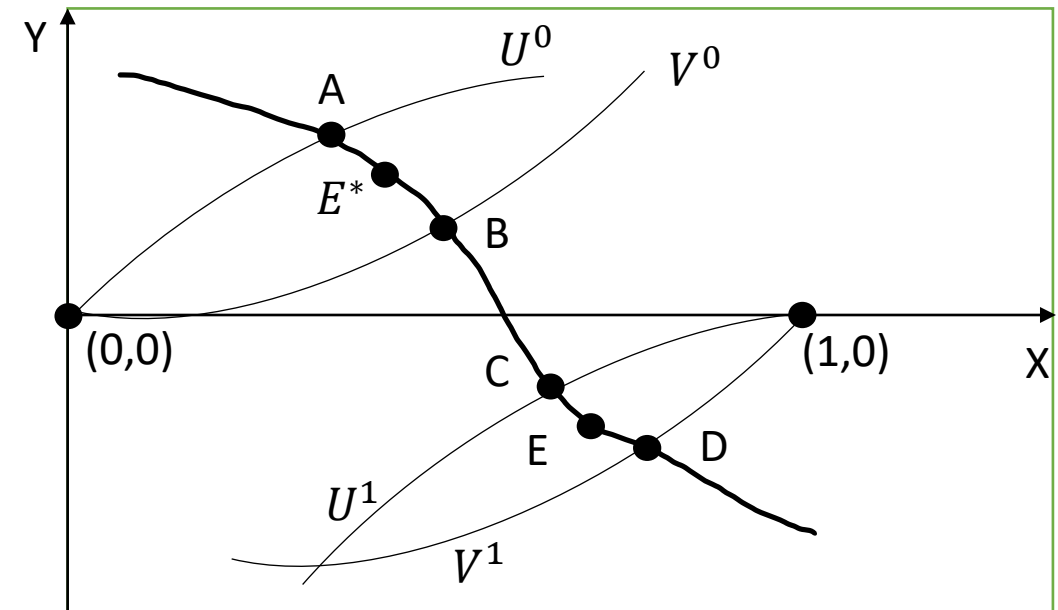
- $U^1$  and  $V^1$  are belong to the situation that rights are with the firm and no bargaining has happened. All the points between them until point E are **Pareto improvements**.
- The same story is true for the points between indifference curves of  $U^0$  &  $V^0$  in which residents have right.
- But the level of pollution of allocation E is higher than the level of pollution of allocation  $E^*$ . Meaning that the firm prefers E above  $E^*$ , while the opposite holds for the residents. Ownership is therefore **attractive** !!



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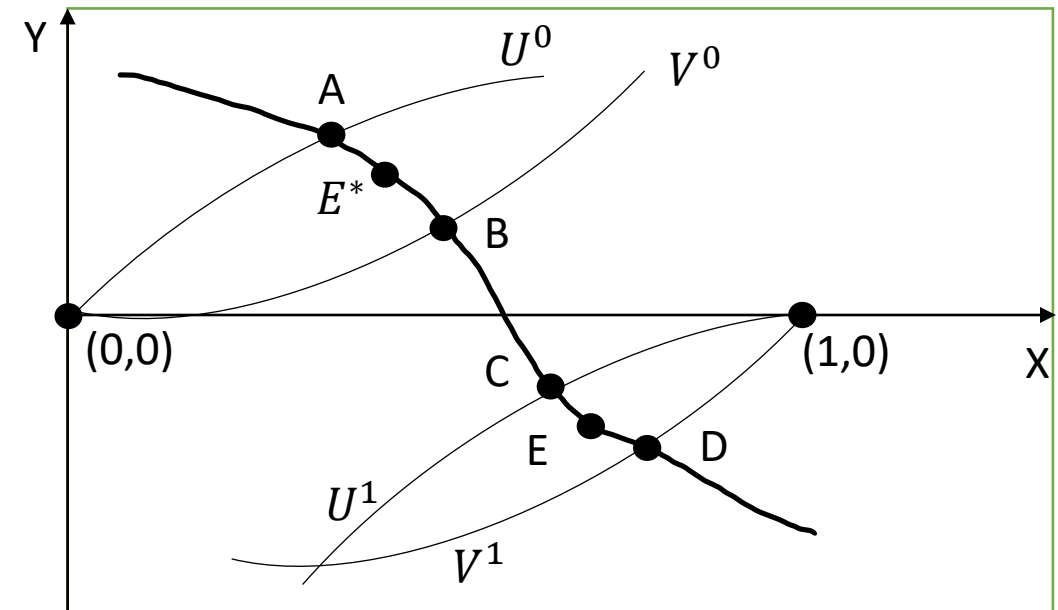
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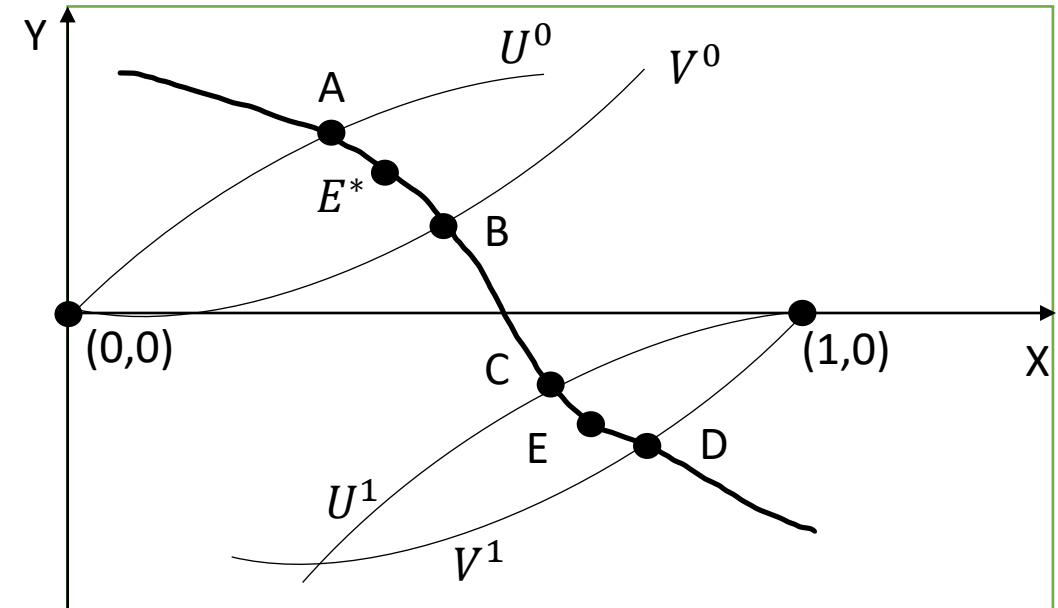




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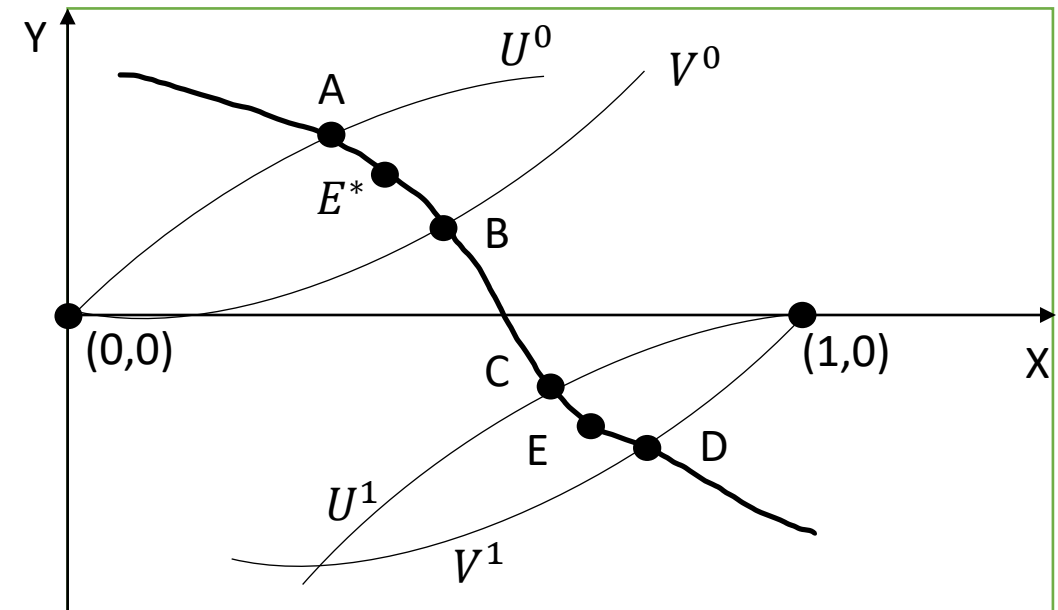
- So the amount of pollution **varies** by the **type of ownership**.
- This result differs from the example at the beginning of this section where the amount of pollution was invariant to the property rights regime.
- So a **stronger** version of the **Coase theorem** is **needed**.



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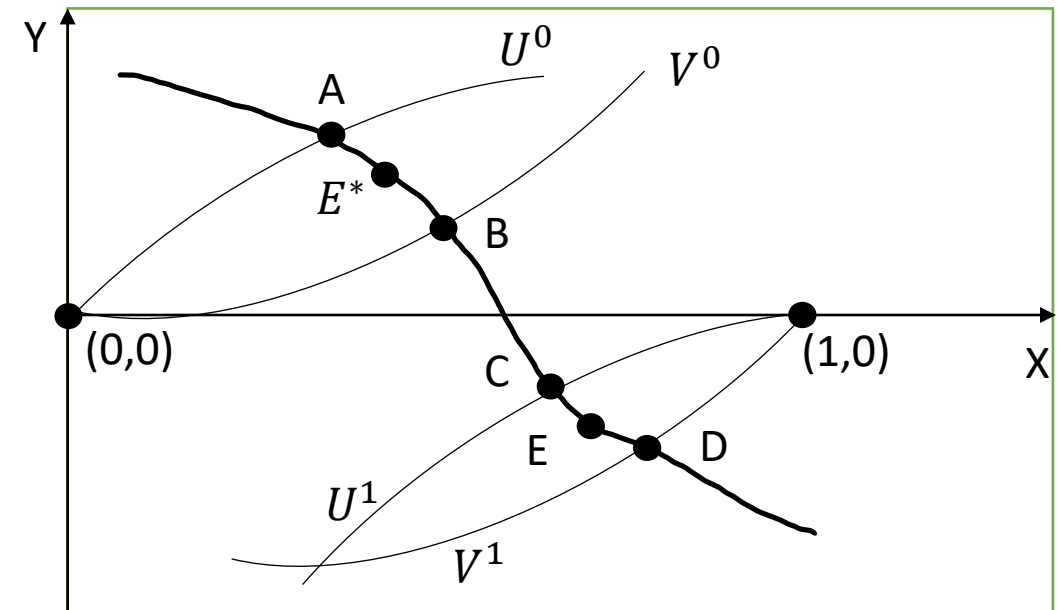
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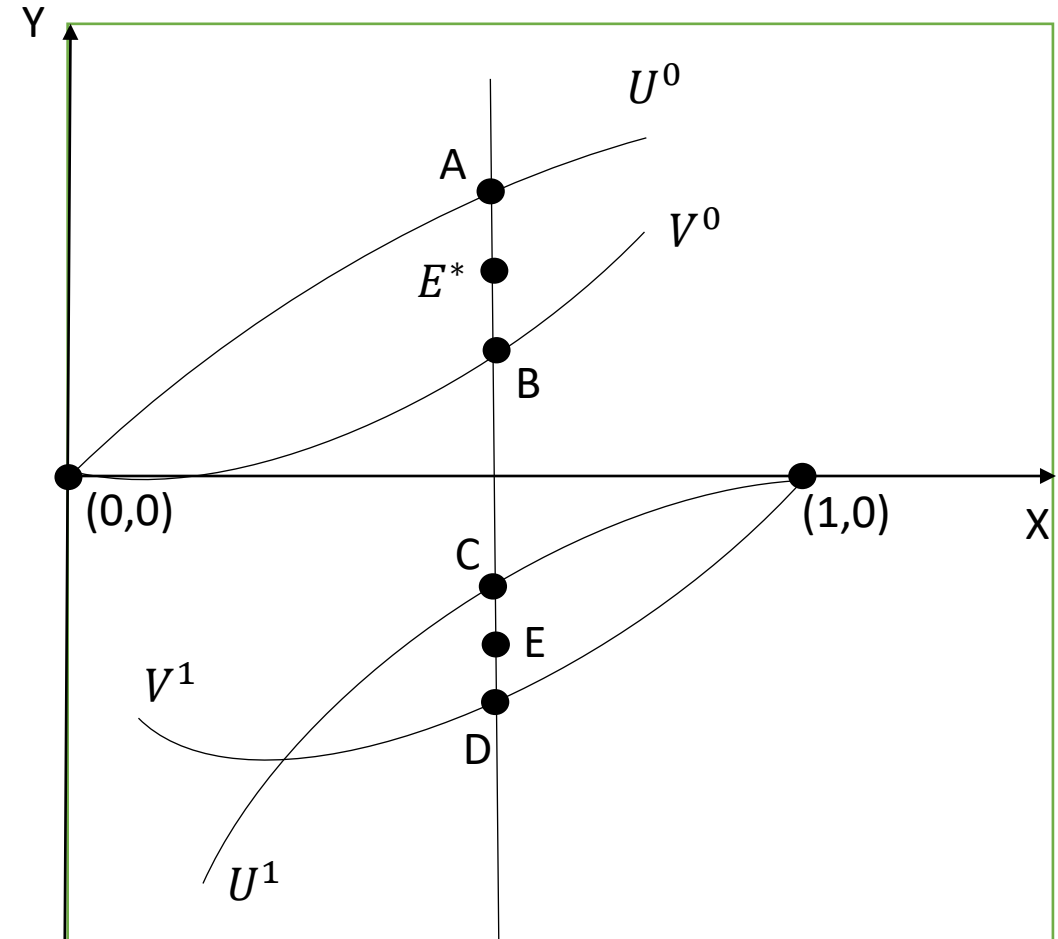
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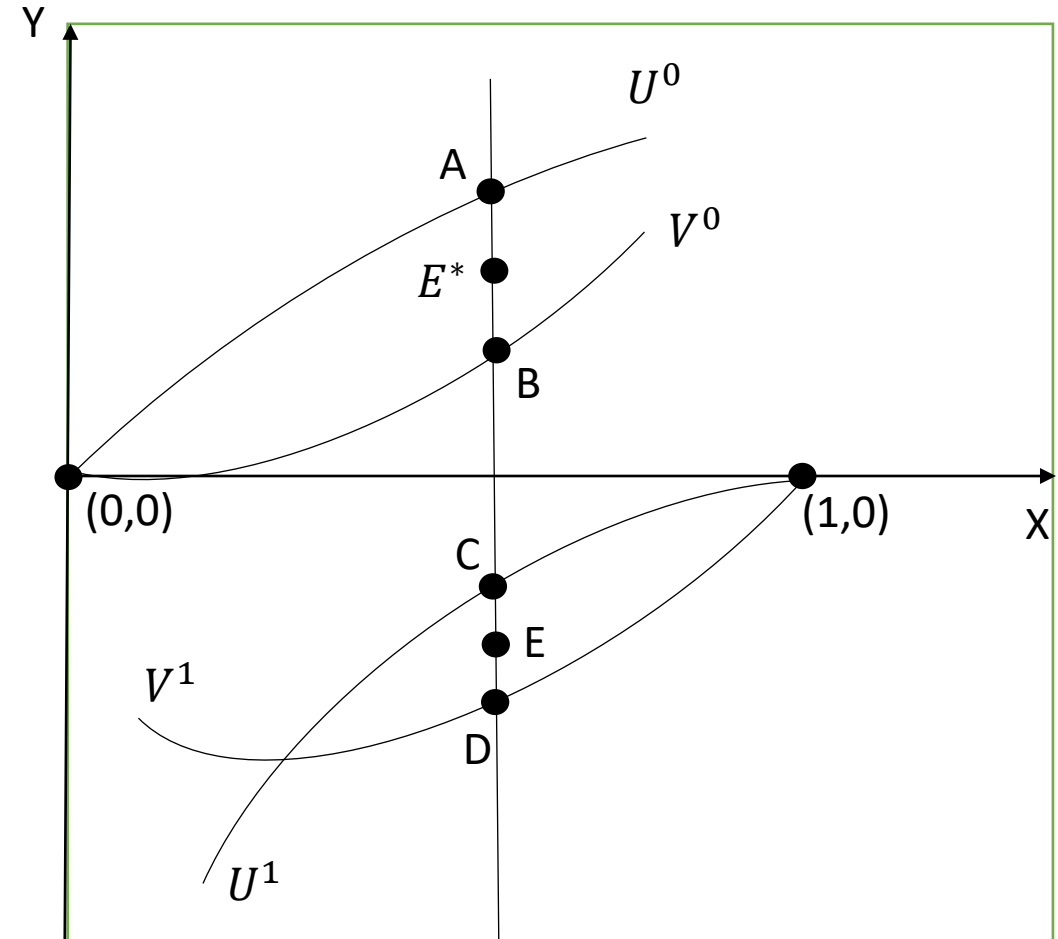
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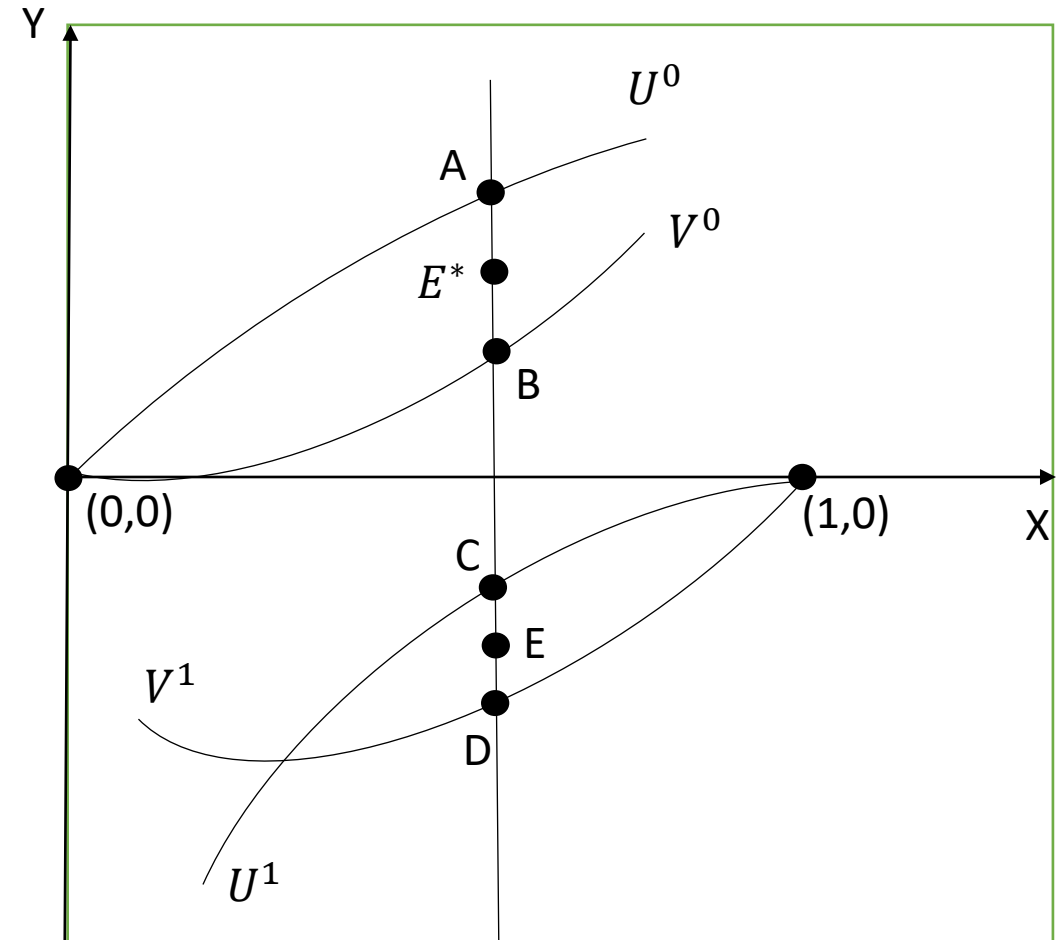
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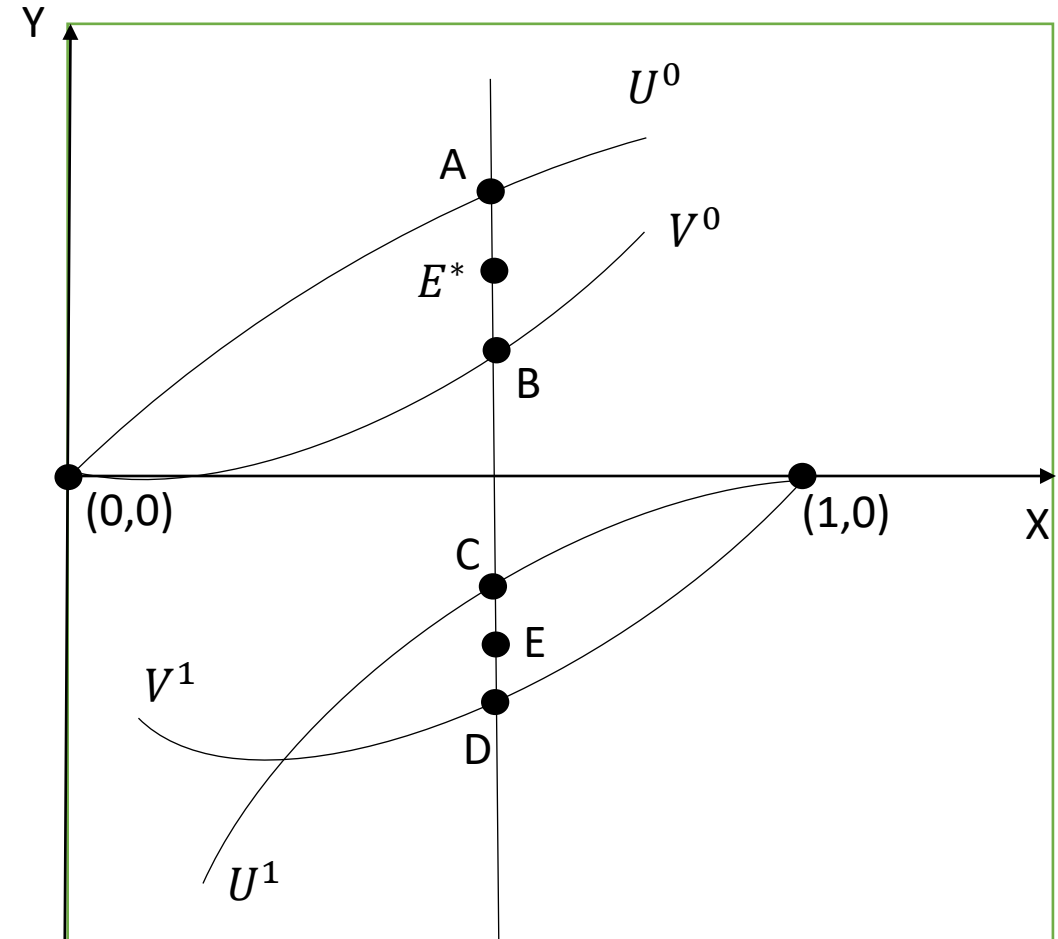
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### 4.3.1 Ownership structure

- **Ownership structure** specifies **who** has the ownership **rights**.
- Ownership rights determine the decision as well as income rights.
- If ownership rights are well specified & the person who decides pays the costs and receives the revenues, then that means production is often used in the most efficient way.

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### Application: Ownership structure regarding land

Suppose:

- A farmer can use his land in two ways:
  - Growing vegetables himself will yield 100.
  - Rent to a third person yield 150.
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- ❑ In this way, the ownership structure could lead to an efficient decision.
- ❑ The farmer will now decide to rent since this will yield 120 for the farmer which is higher than 100 and 30 for the brother which is lower than 50 but definitely higher than nothing.
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- The Coase theorem can be interpreted as a *decentralization* result.
- It says bargaining is efficient, but there is no attention to possible associated problems in bargaining.
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- In the Coase theorem we might find a more important contribution of **institutional aspects** like legal status and ownership rights than the welfare theorem.
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- In the **Coase theorem** assumes the **cost of bargaining** and achieving an agreement is **zero**.
- If the market exchange is inefficient, one can still achieve an efficient result when bargaining is without a problem.
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## 4.5.1 One-sided asymmetric information

- In our firm-residents game, we assume both of them are **fully honest**.
  - Now assume one party i.e. firm misreported its preferences.
  - For instance it may under-report his willingness to pay for polluting the river, and as residents think they are honest, an agreement that is in favor of the firm may be accomplished.
- ❖ The party with the superior information should have the decision authority, in order to realize the maximum surplus.
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Application: Asymmetric information in the bidding process for a house:

Assume:

- The **reservation price** of a house for a **buyer** is **6**.
- The **reservation price** for a **seller** is **2**.
- **Buyer misrepresents** his willingness to pay to **3**.
- **Seller misrepresents** his willingness to sell to **5**.
- They may end to exchange in **4**.
- **Both** of them are **gained** from the exchange !!

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## 4.5.3 Multiple parties

- **More parties** would further **complicate** the exchange when there is **asymmetric information**.
- I.e. a small minority can threaten to block an agreement in order to receive a larger share of the pie that is created.
- Such “free-rider” behavior makes it hard to establish unanimity.

Example: Public organizations:

- Public organizations might own many characteristics of an inefficient control structure.
- Decisions are divided between many managers and politicians.
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### Not all the ownership rights can be traded:

- Ownership rights might **not be allocated**. (use of water and air) (( damaging the Ozone layer))
- Ownership rights might be allocated but not implemented. ( ownership is not protected when ownership rights are allocated)
- Ownership rights might be allocated and implemented but not enforced. (incompleteness of contractual agreements, contract violations, corruption)
- Ownership rights might be allocated and implemented and enforced but not tradable. ( Bosman judgment in European soccer: “players are employees not the property of clubs)
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- Ownership rights might be **allocated** and **implemented** and **enforced** but **not tradable**. ( Bosman judgment in European soccer: “players are employees not the property of clubs)
- Inefficiencies of ownership due to the bad allocation of the decisions and income rights.

## 4.6 Property rights

### Not all the ownership rights can be traded:

- Ownership rights might **not be allocated**. (use of water and air) (( damaging the Ozone layer))
- Ownership rights might be **allocated** but **not implemented**. ( ownership is not protected when ownership rights are allocated)
- Ownership rights might be **allocated** and **implemented** but **not enforced**. (incompleteness of contractual agreements, contract violations, corruption)
- Ownership rights might be **allocated** and **implemented** and **enforced** but **not tradable**. ( Bosman judgment in European soccer: “players are employees not the property of clubs)
- Inefficiencies of ownership due to the **bad allocation** of **separation of decisions** and **income rights**.