Essentials of Economics
Chapter 2: Coase theorem

Essentials of Economics

Ferdowsi University of Mashhad

Winter Term 2023-24

Plan


4.1 Introduction
4.2 Additional market for externalities
4.3 Focus of the Coase theorem
4.4 Income effects
4.5 Bargaining problem
4.6 Property rights

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Introduction

First Solution!

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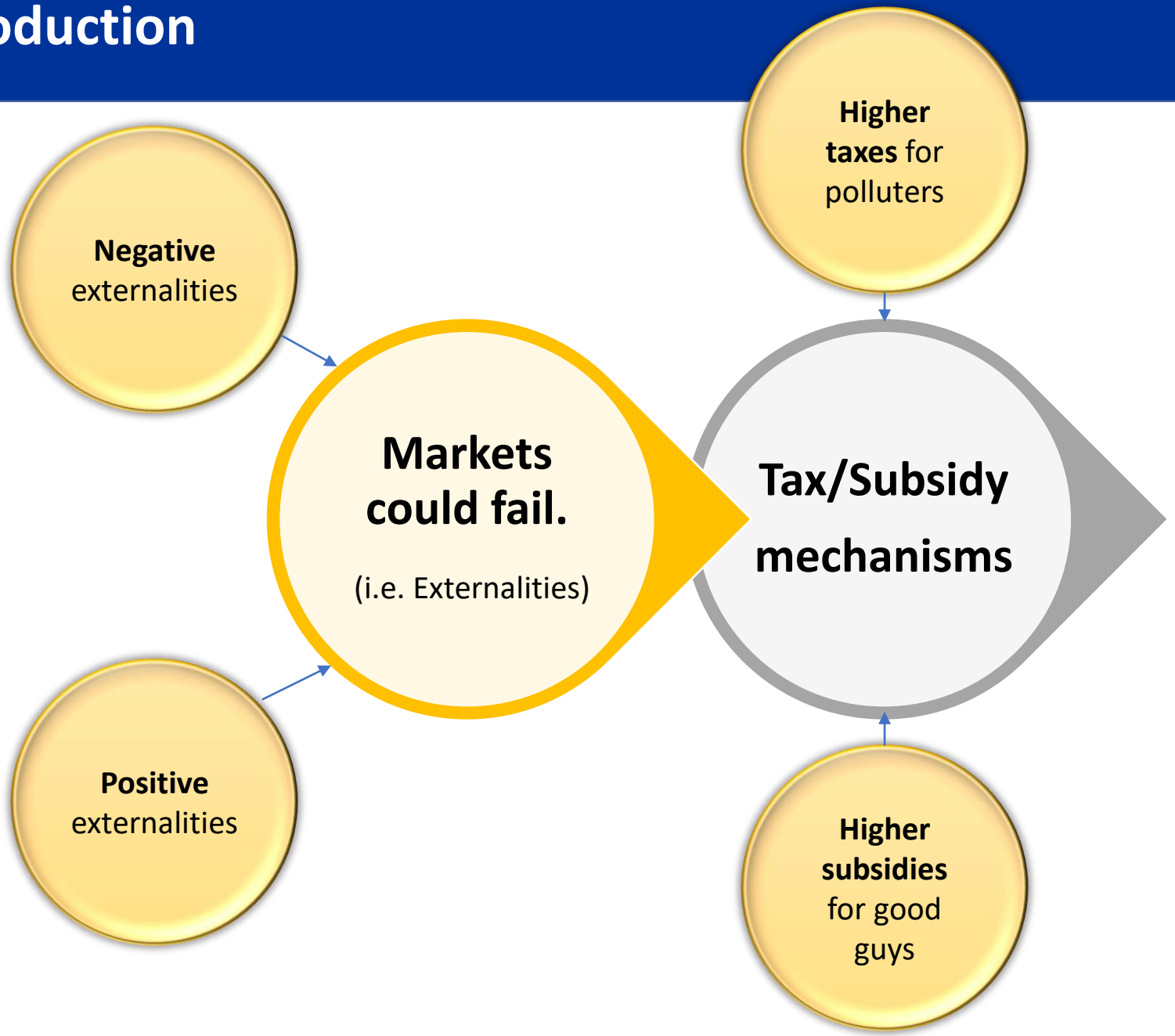

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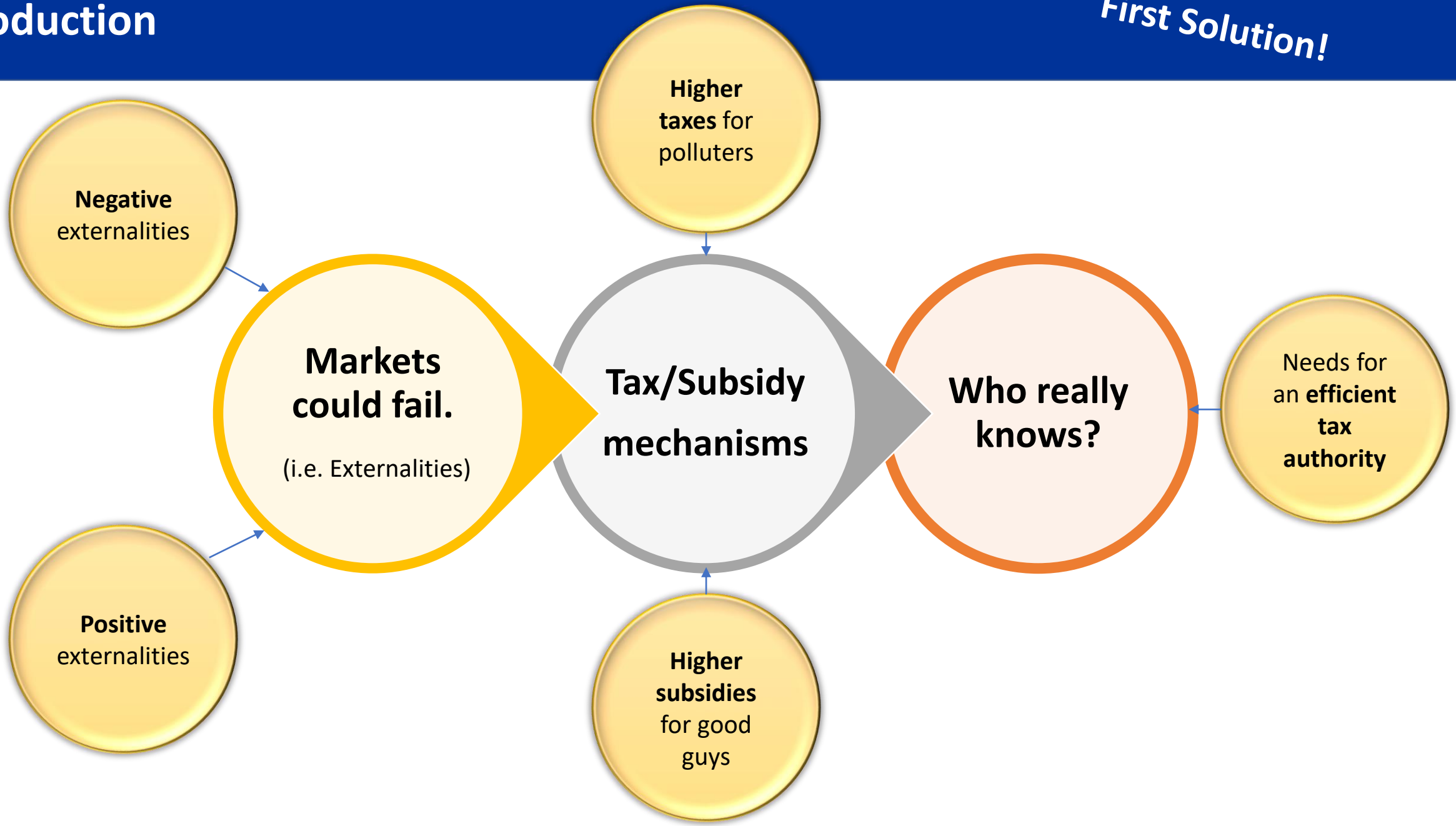

Introduction

Second Solution!

Introduction

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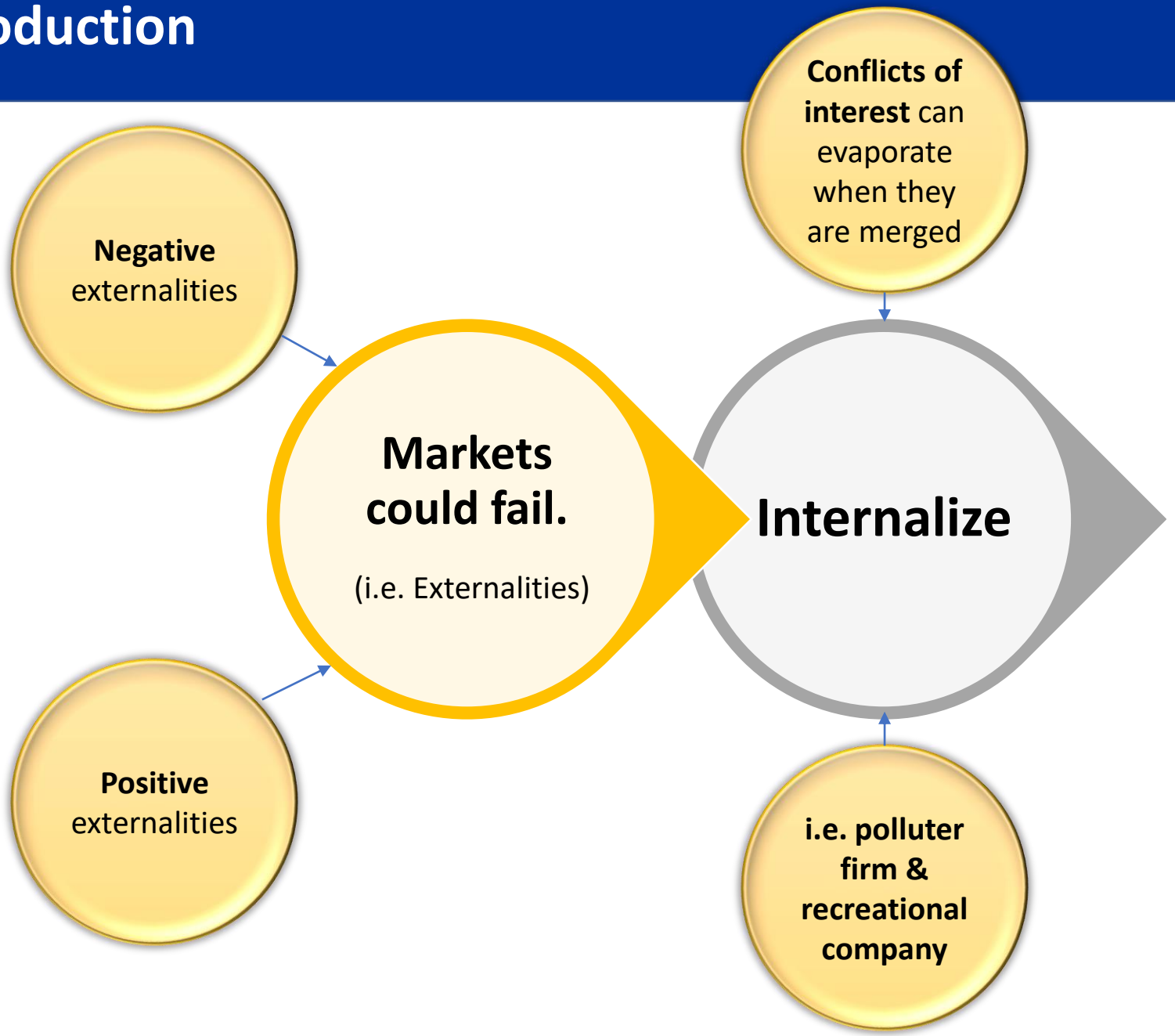

Introduction

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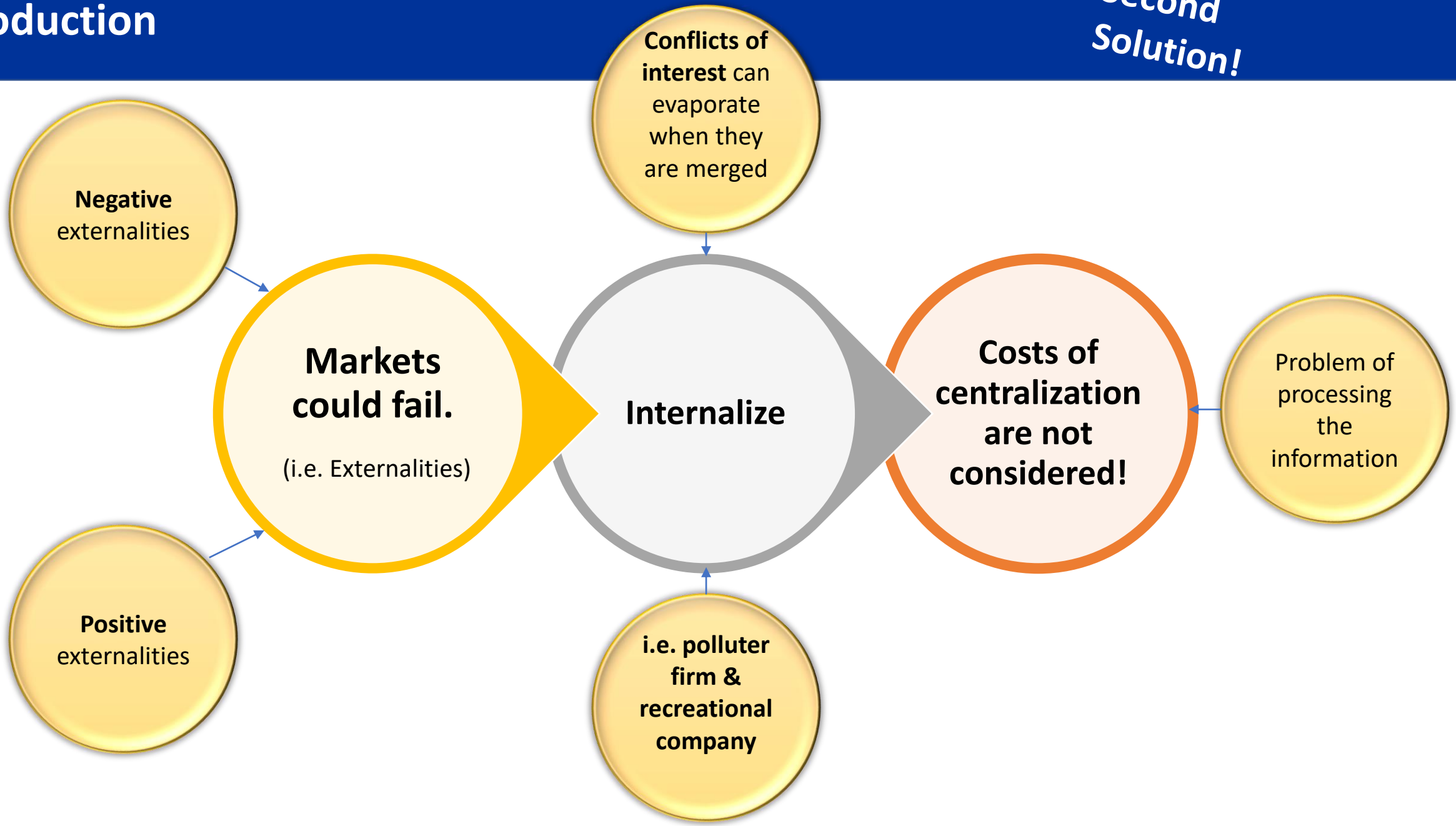

??? Solution!

Is there any **third solution**?

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Yeah, this chapter ☺

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4.3 Focus of the Coase theorem
4.4 Income effects
4.5 Bargaining problem
4.6 Property rights

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**

S.t

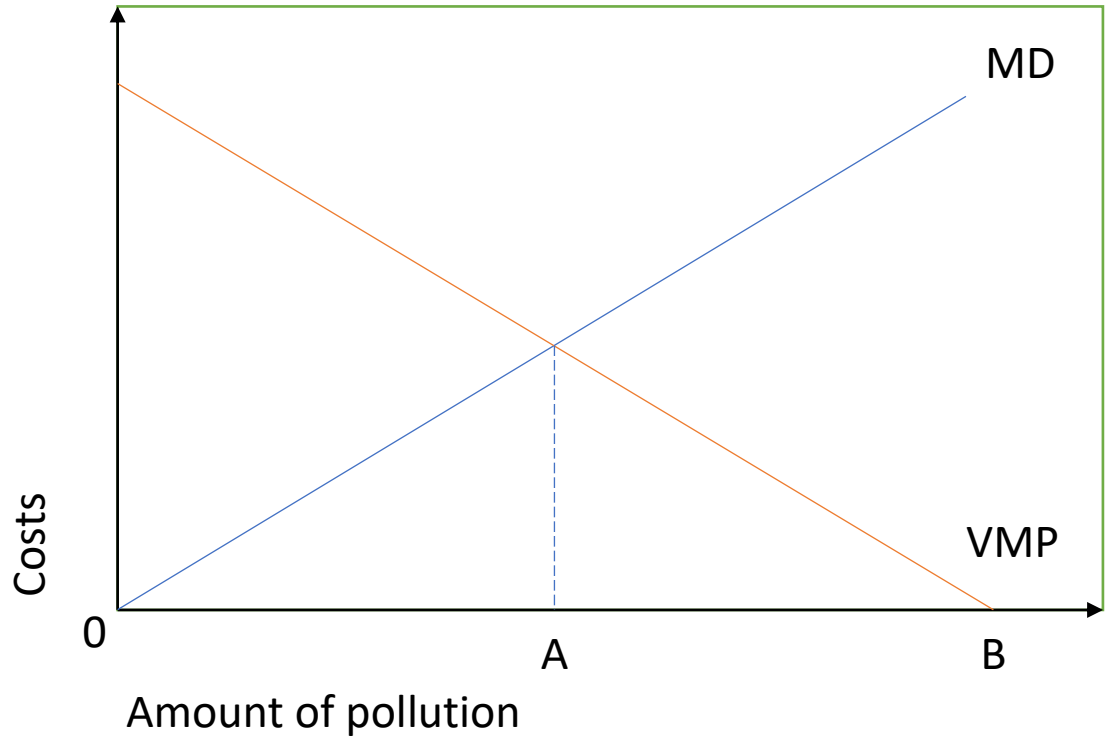
Value of one marginal unit of pollution of the firm = **VMP**

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.

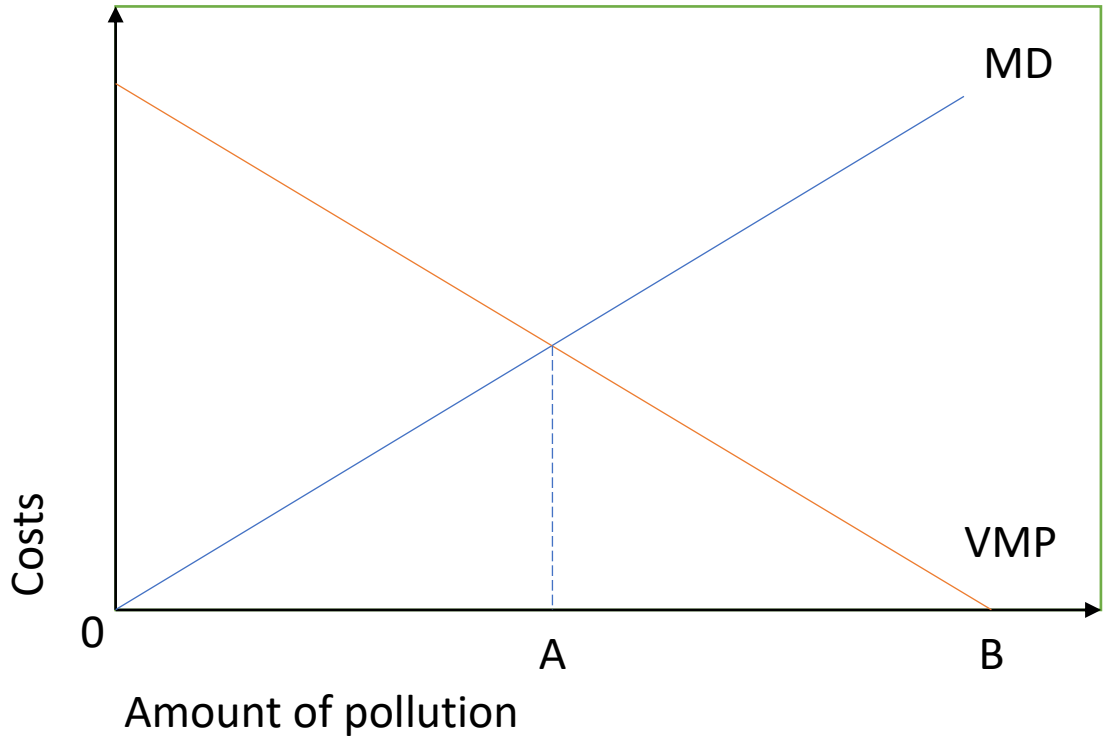


4.2 Additional market for externalities

- 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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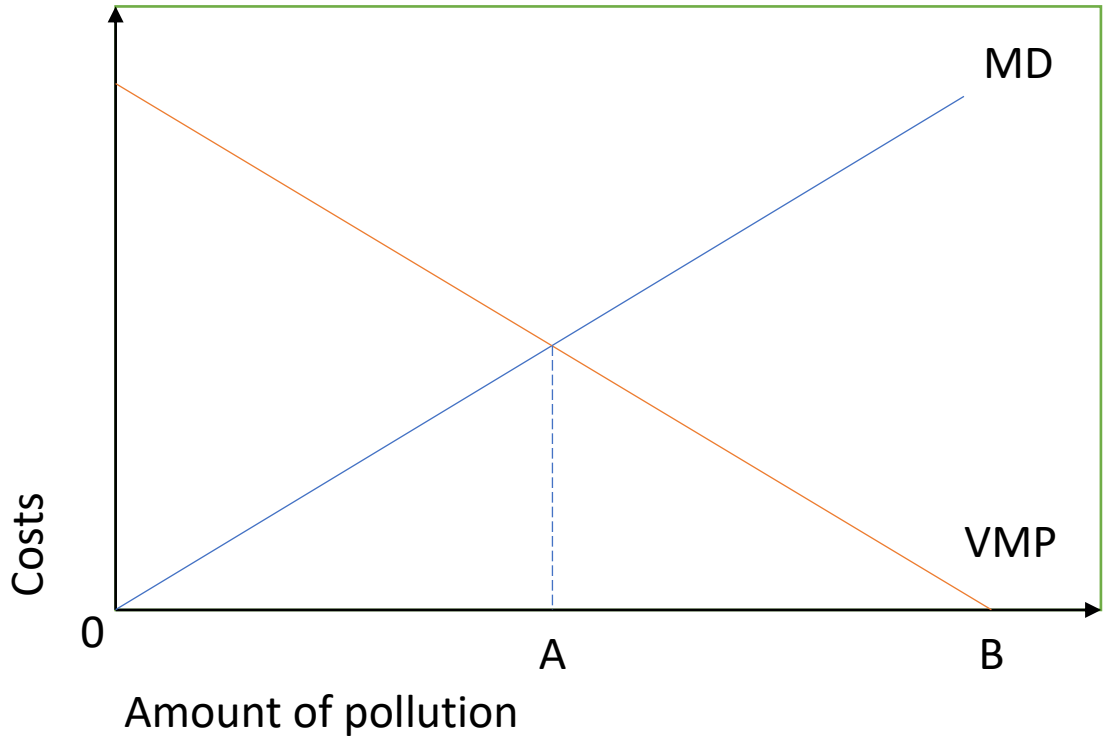
- The firm has the right to dump **B** units of pollution in the lake.
- However, this is not what the firm will do.
- The locals are willing to pay the firm to reduce the pollution from **B** to **A**. Since for every unit between **A** & **B** it holds that MD > VMP.
- Both parties profit from this 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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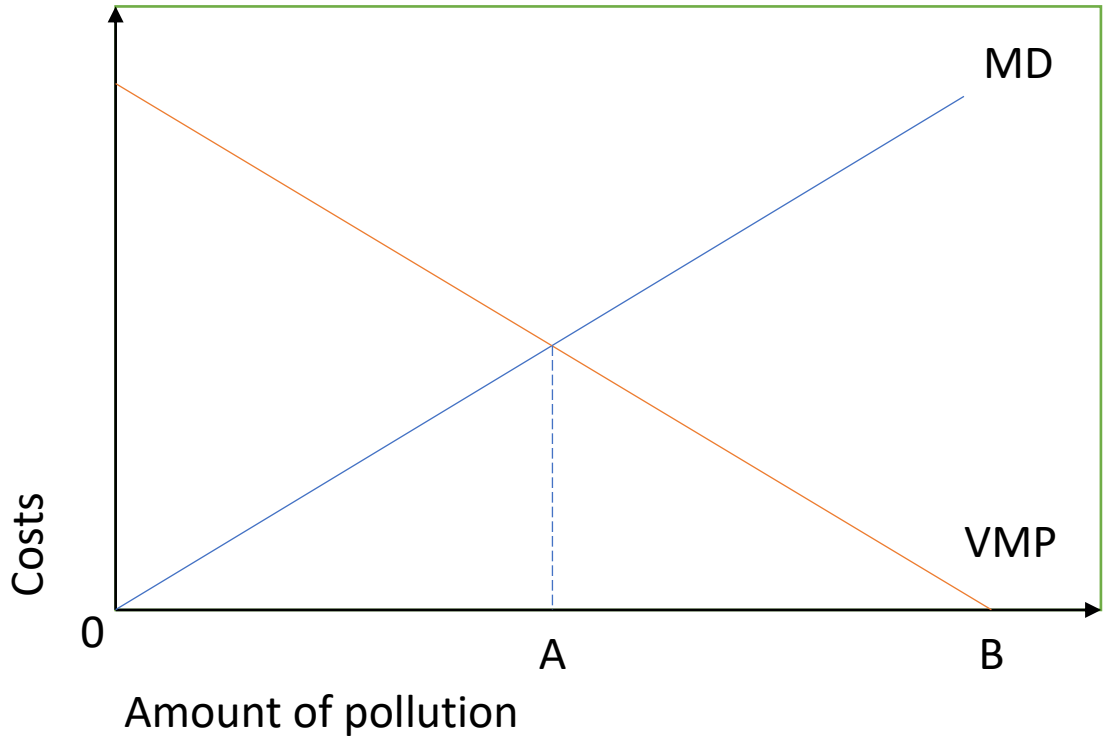

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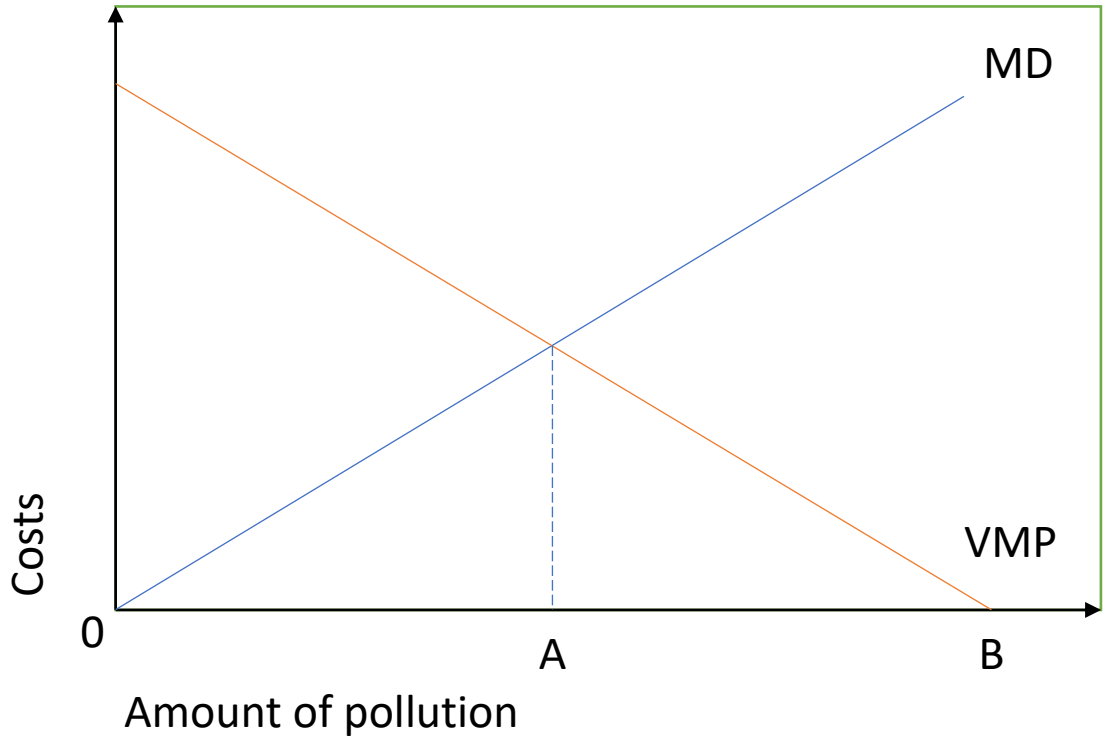

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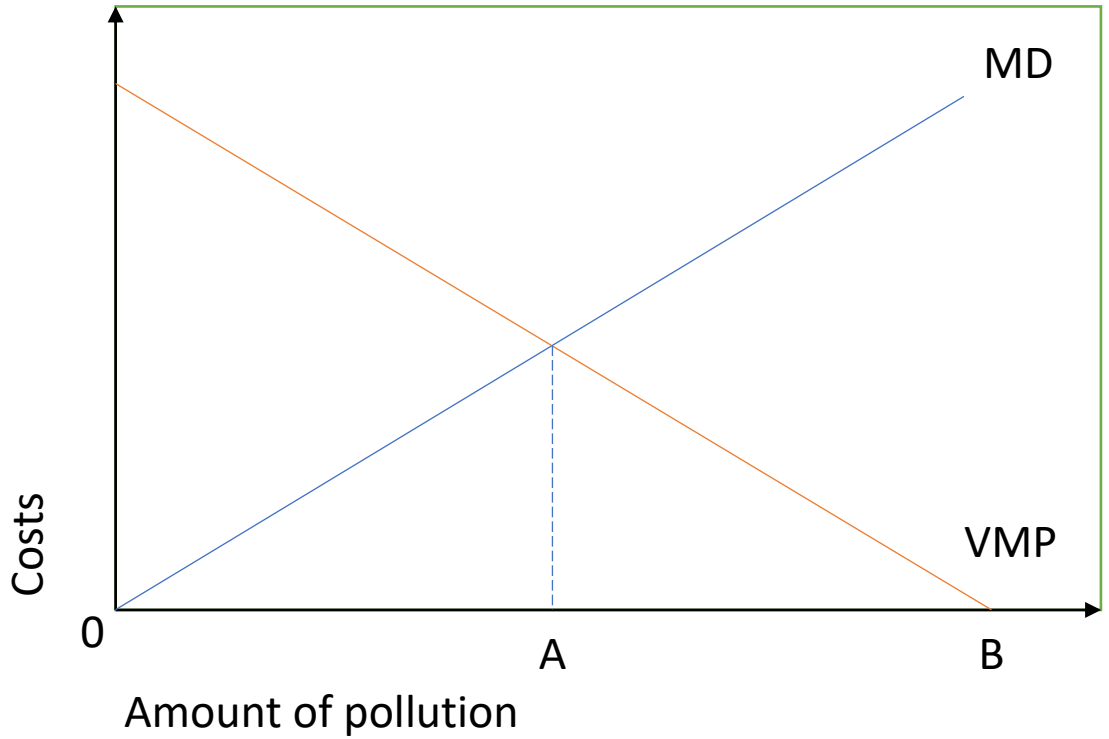

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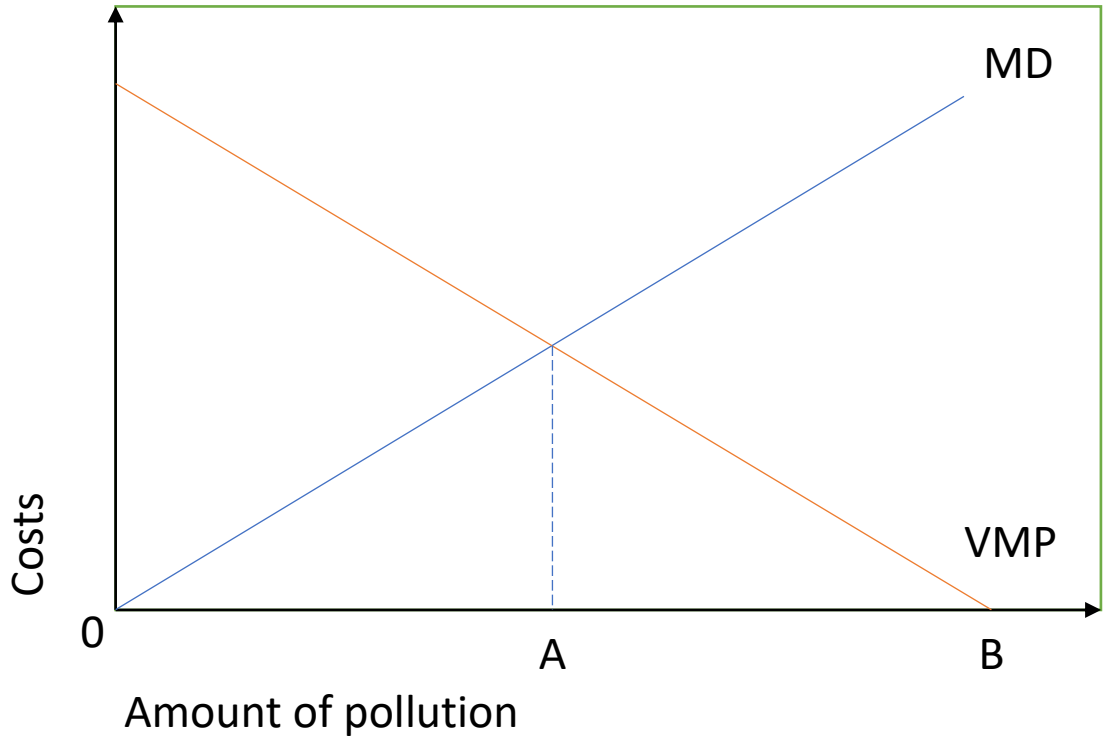

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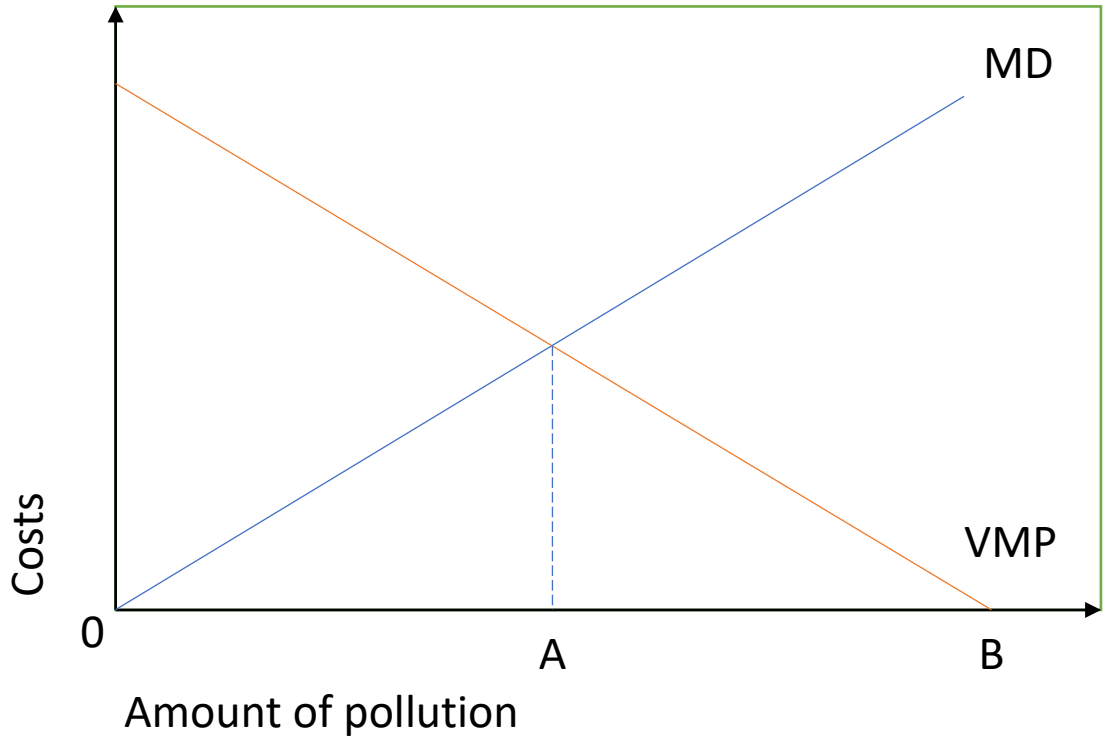

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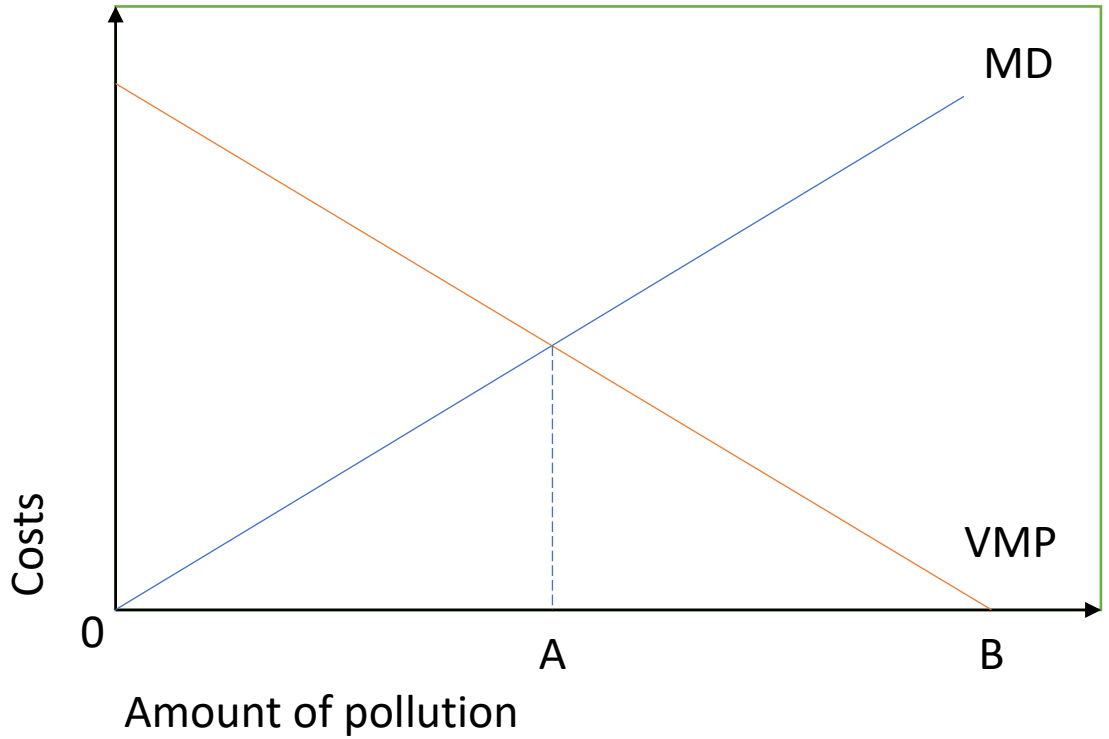

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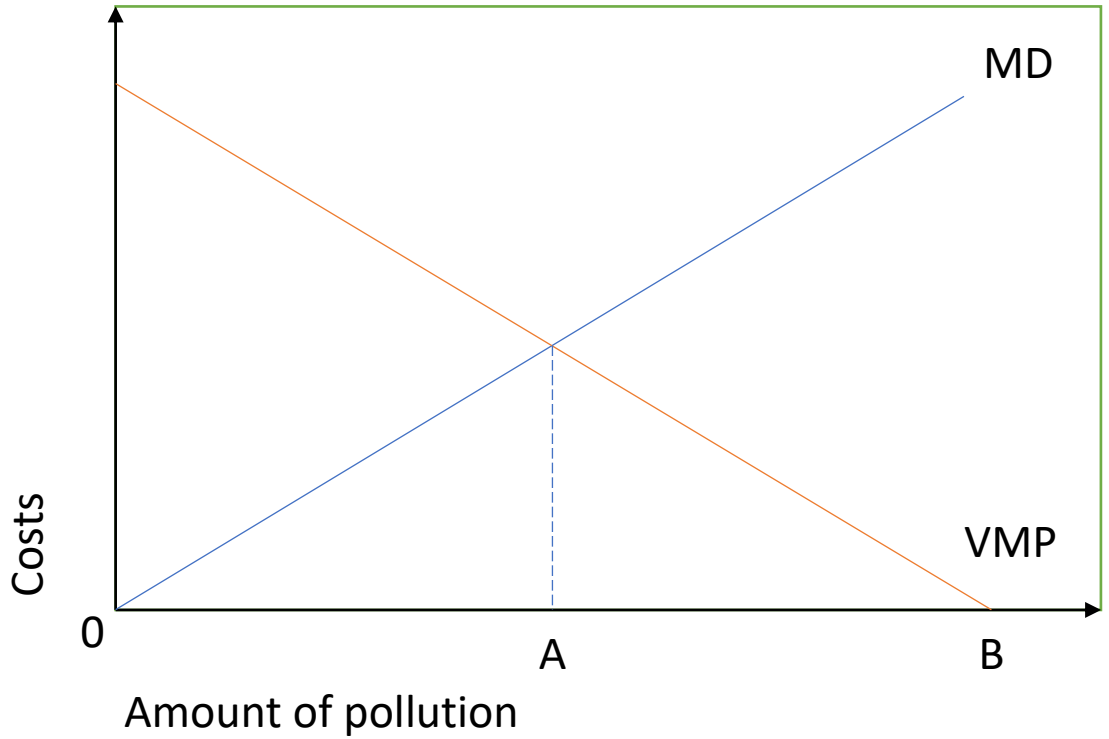

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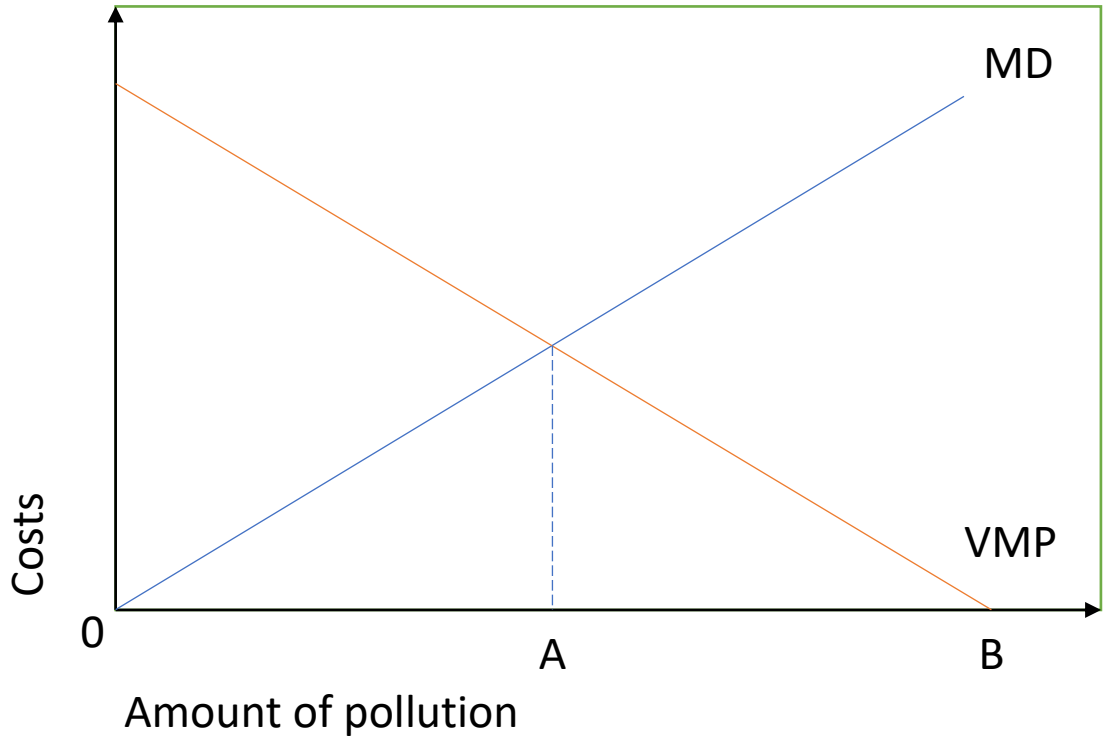

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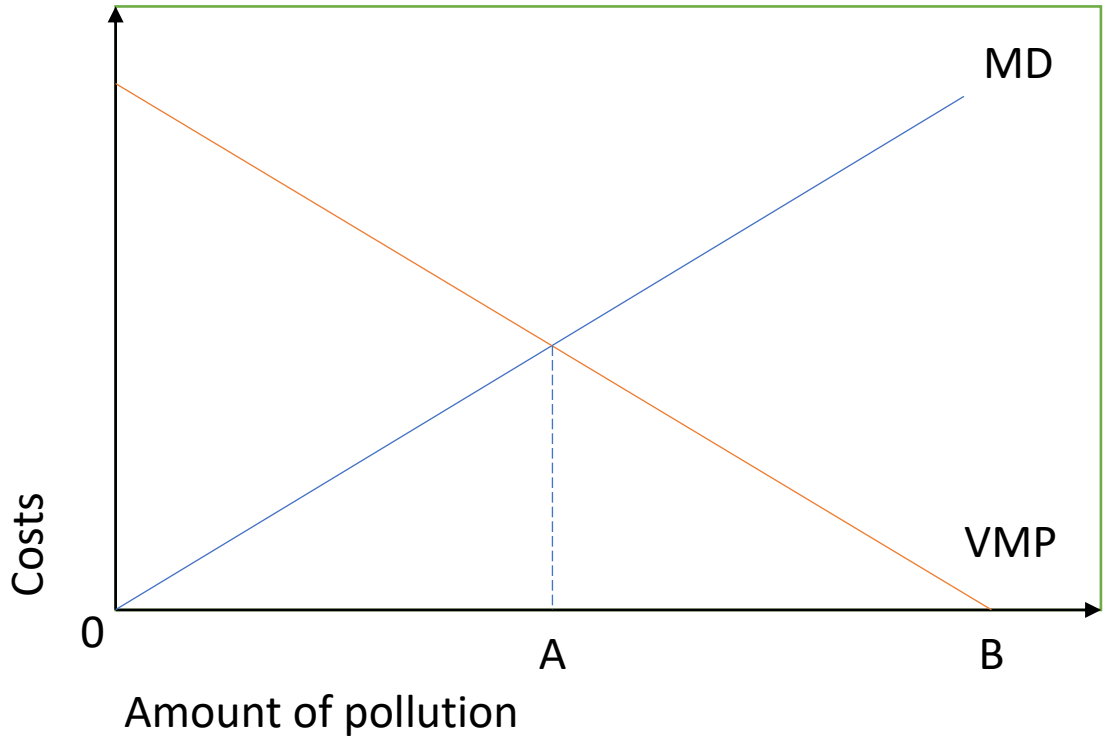

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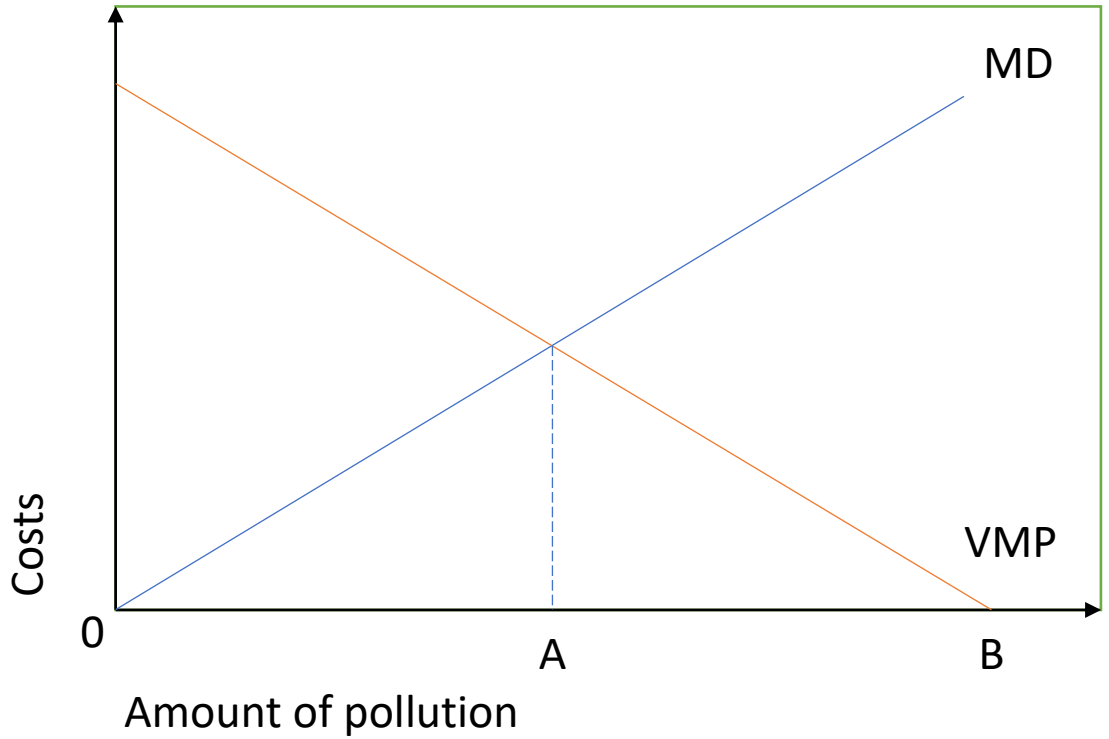

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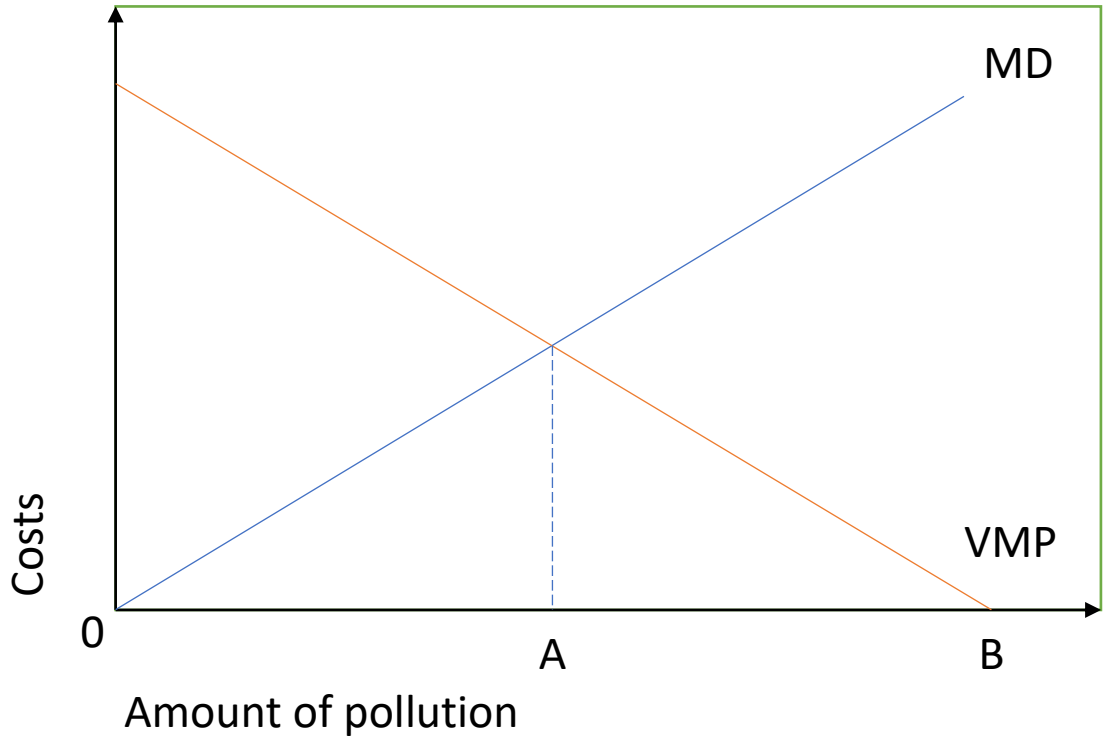

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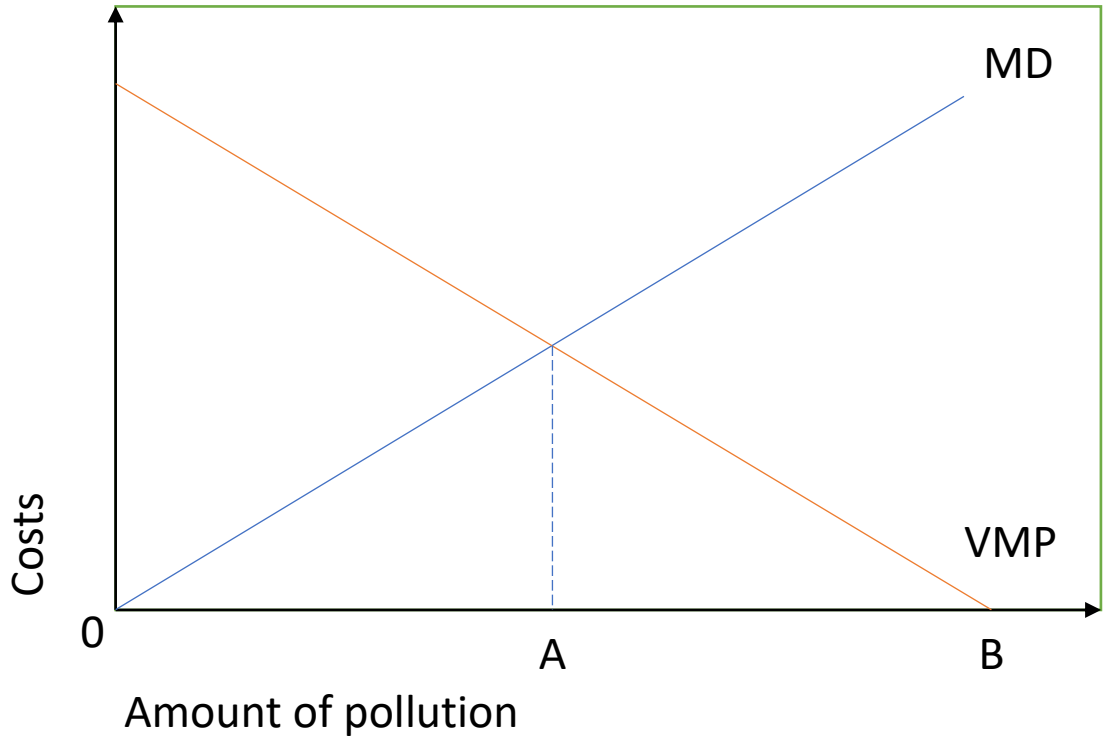

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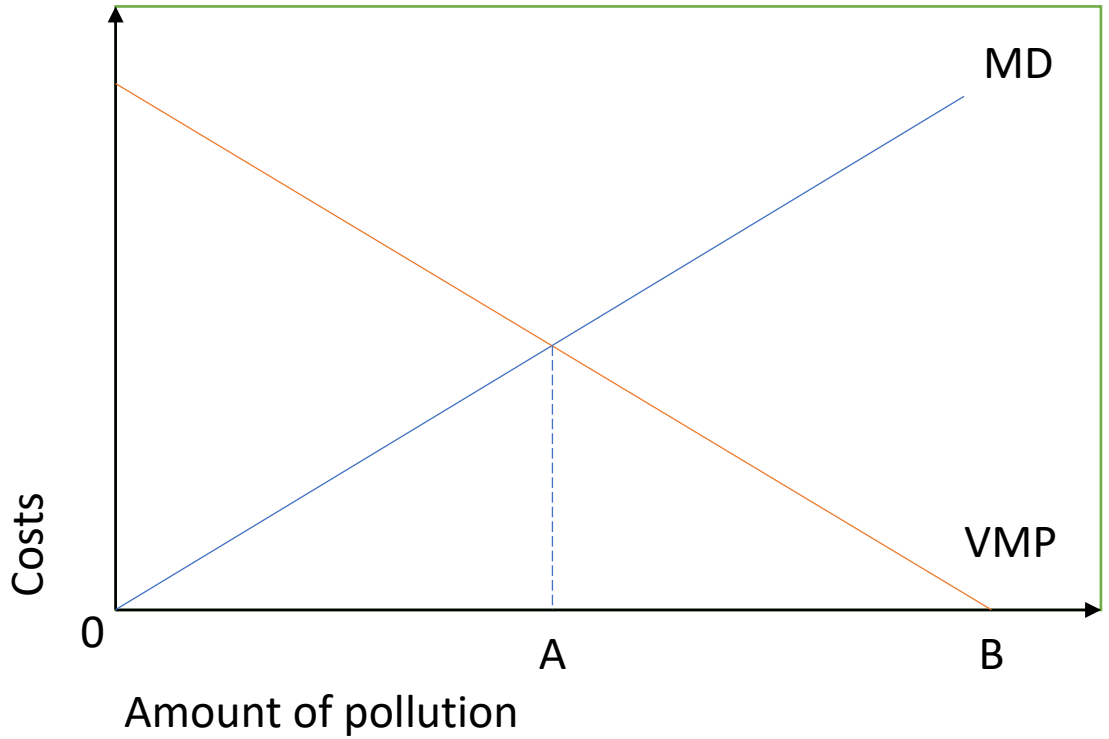

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❖ Coase theorem (1960)

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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4.2 Additional market for externalities

McKelvey & Page (1999) presented the Coase theorem graphically

Assume:

x = the amount of pollution produced by the firm

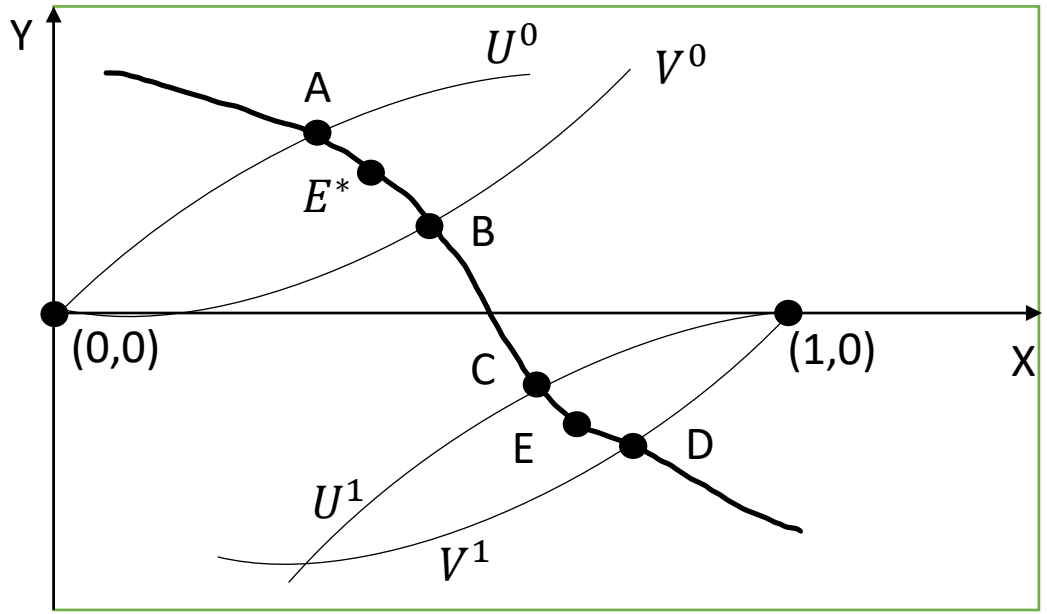
Where, x is between 0 & 1

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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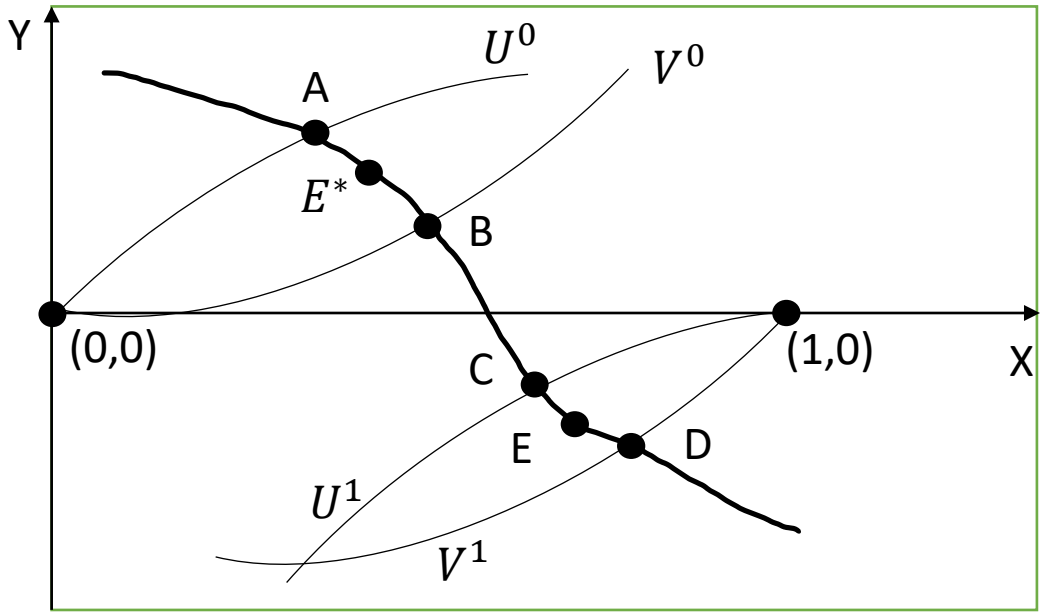
McKelvey & Page (1999) presented the Coase theorem graphically

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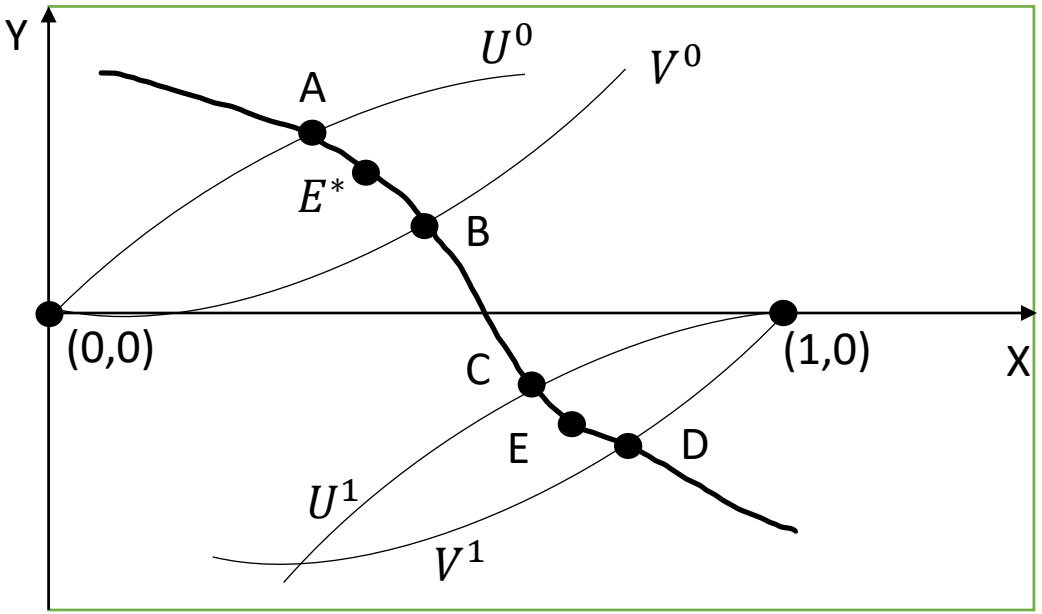
- If the residents have the right and **no bargaining** happened, then nobody pays (**y = 0**), and residents maximize the **v(x,0)** in which the value of **x** will be zero (or **v(0,0)**)
- The In case of rights by residents and an **efficient bargaining** the efficient allocation will be in E^*



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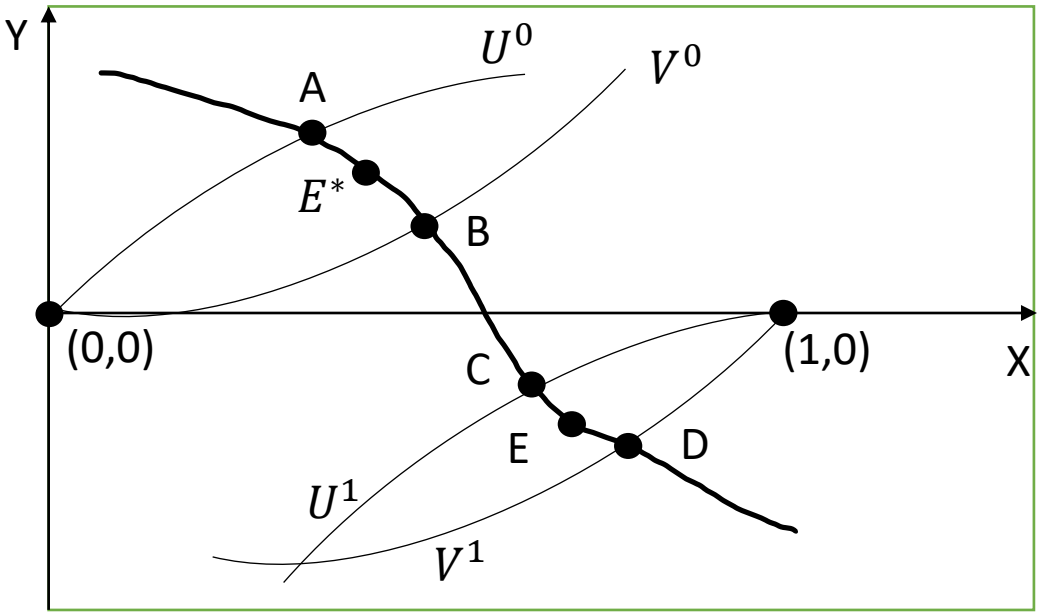
McKelvey & Page (1999) presented the Coase theorem graphically

- 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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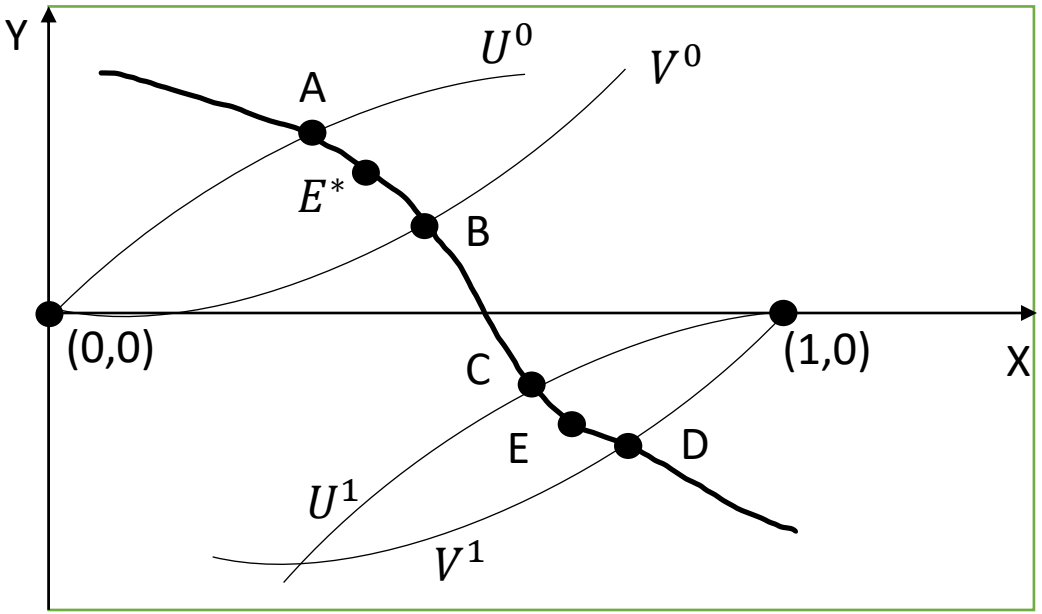

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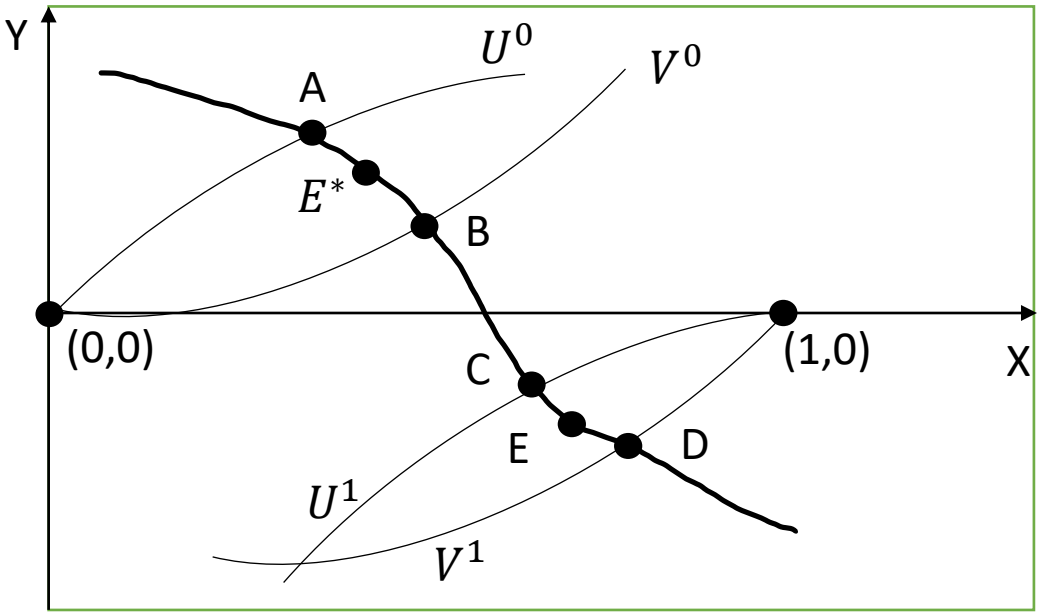

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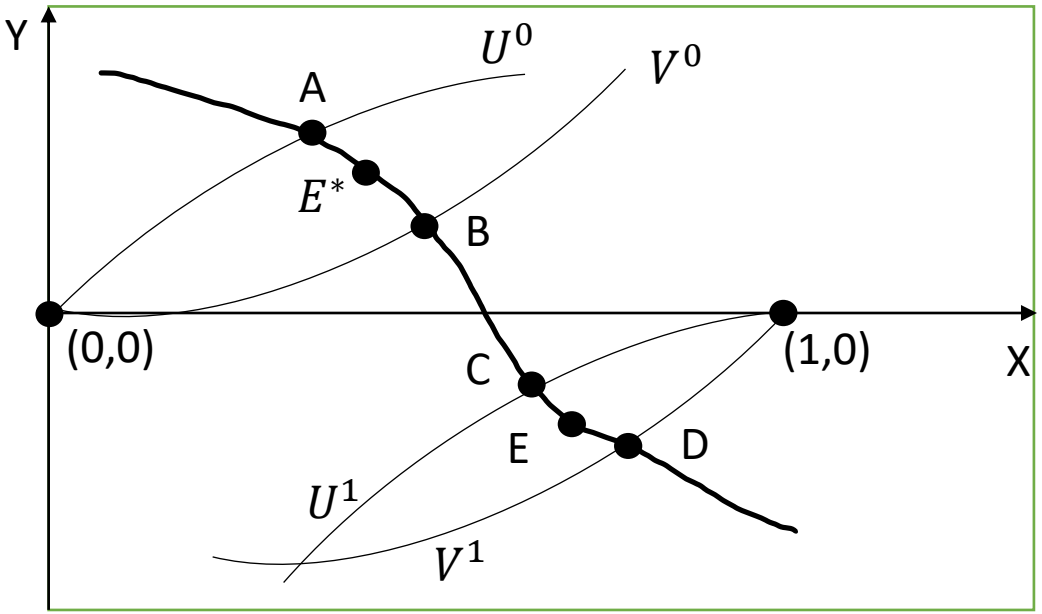
- So the amount of pollution **varies** by the **type** of **ownership**.
- This result differs from the example at the beginning of this section where the amount of pollution was invariant to the property rights regime.
- So a **stronger** version of the **Coase theorem** is **needed**.



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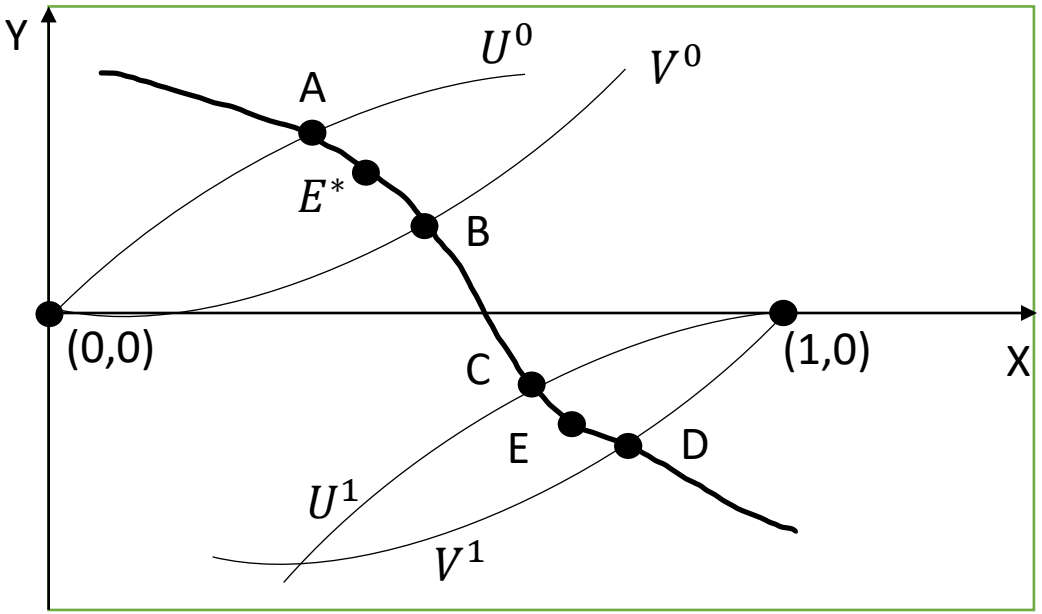

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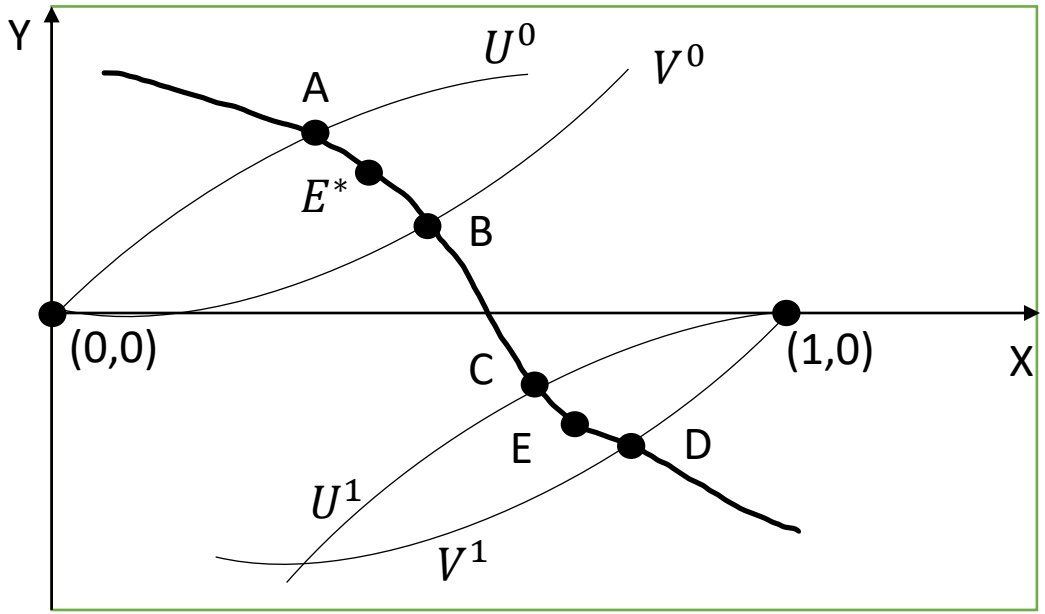

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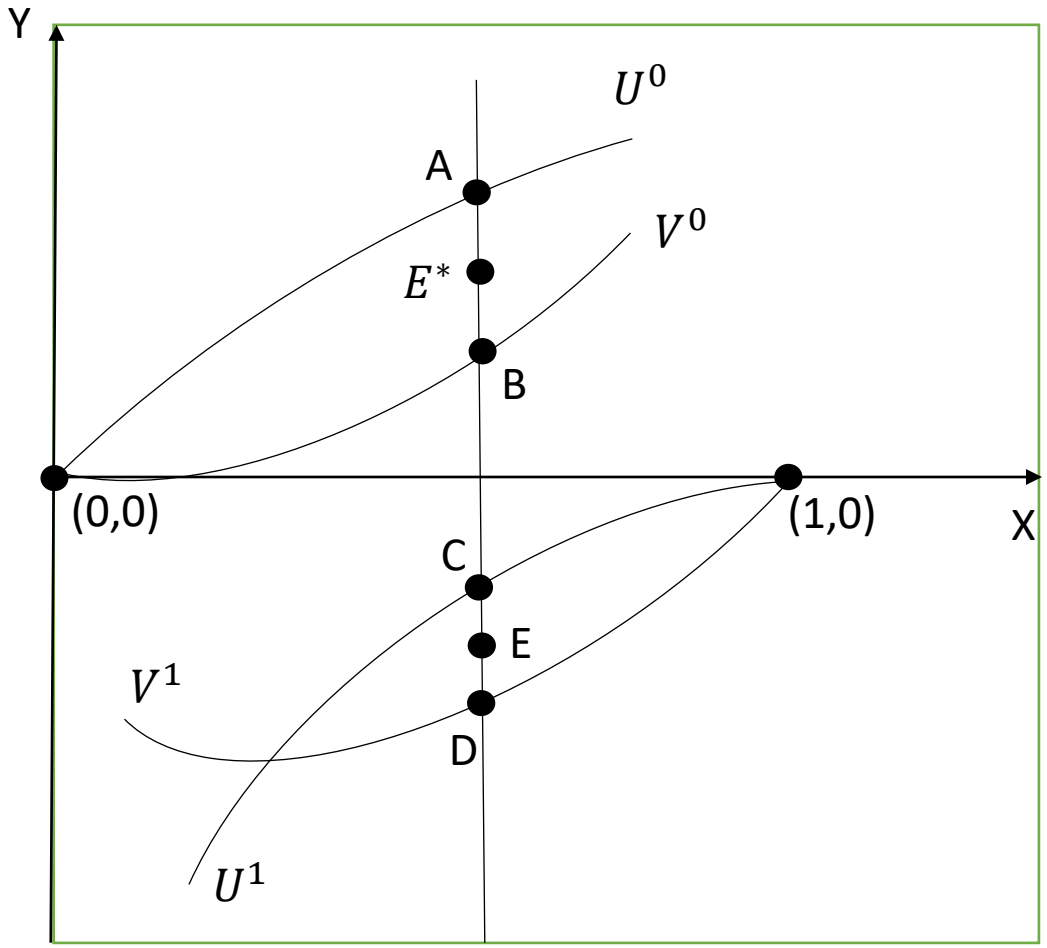
❖ Coase theorem (strong version)

If:

1. Property rights are defined, allocated, and enforced
2. Bargaining is efficient
3. Preferences do not exhibit income effects

Then:

Every allocation of property rights in externalities will result in a **Pareto-efficient** allocation. And the amount of damage is invariant to the allocation of property rights.



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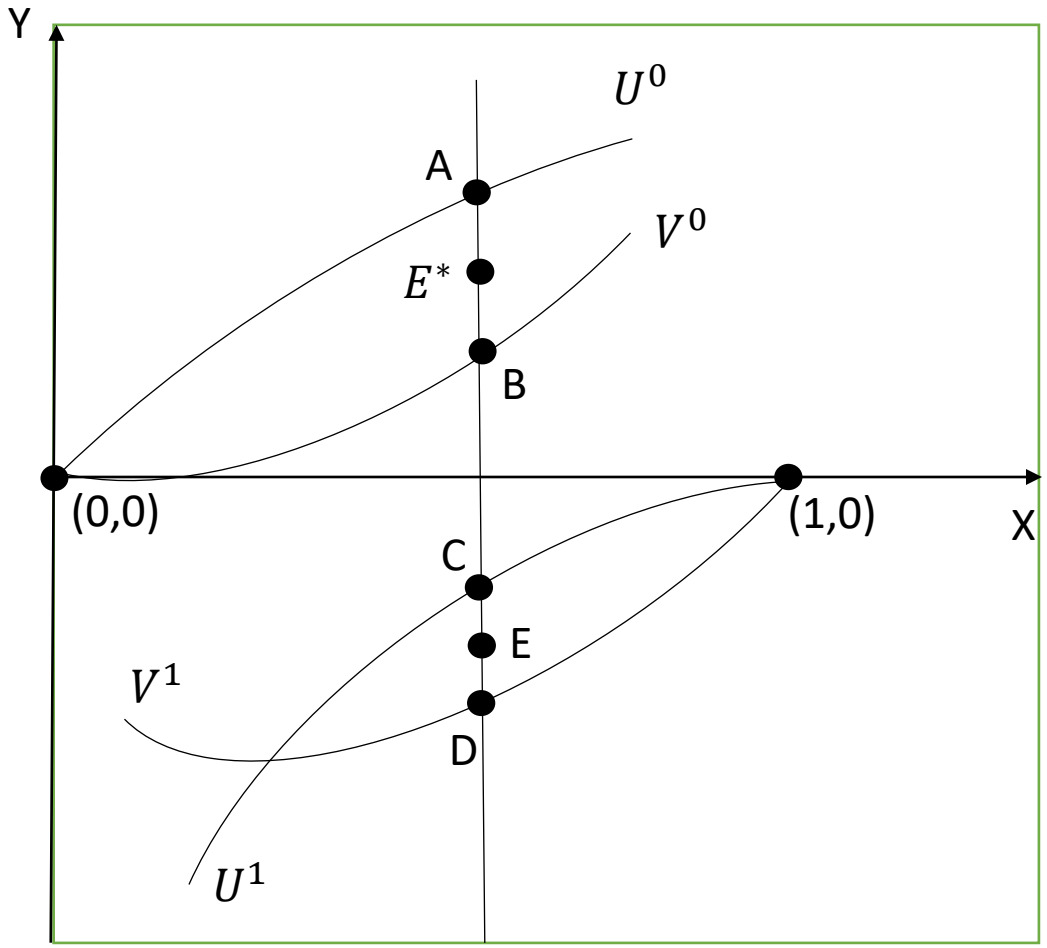

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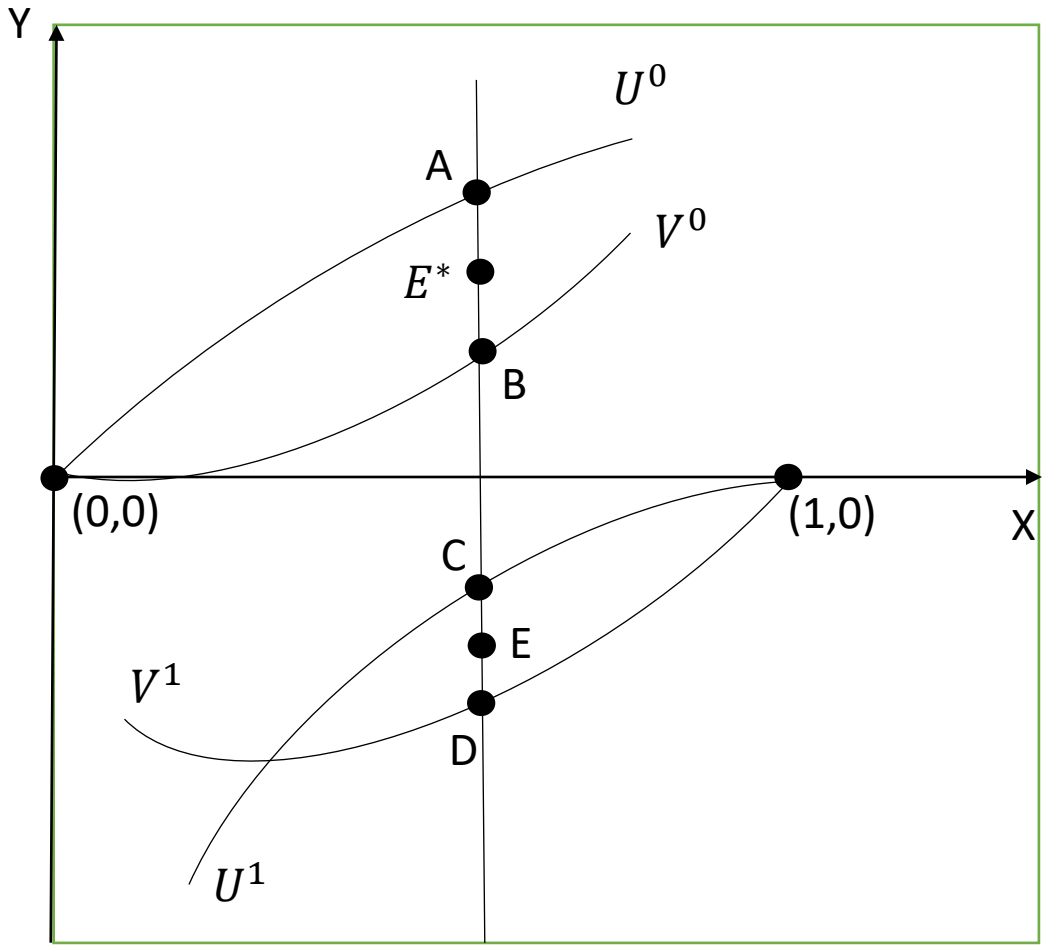

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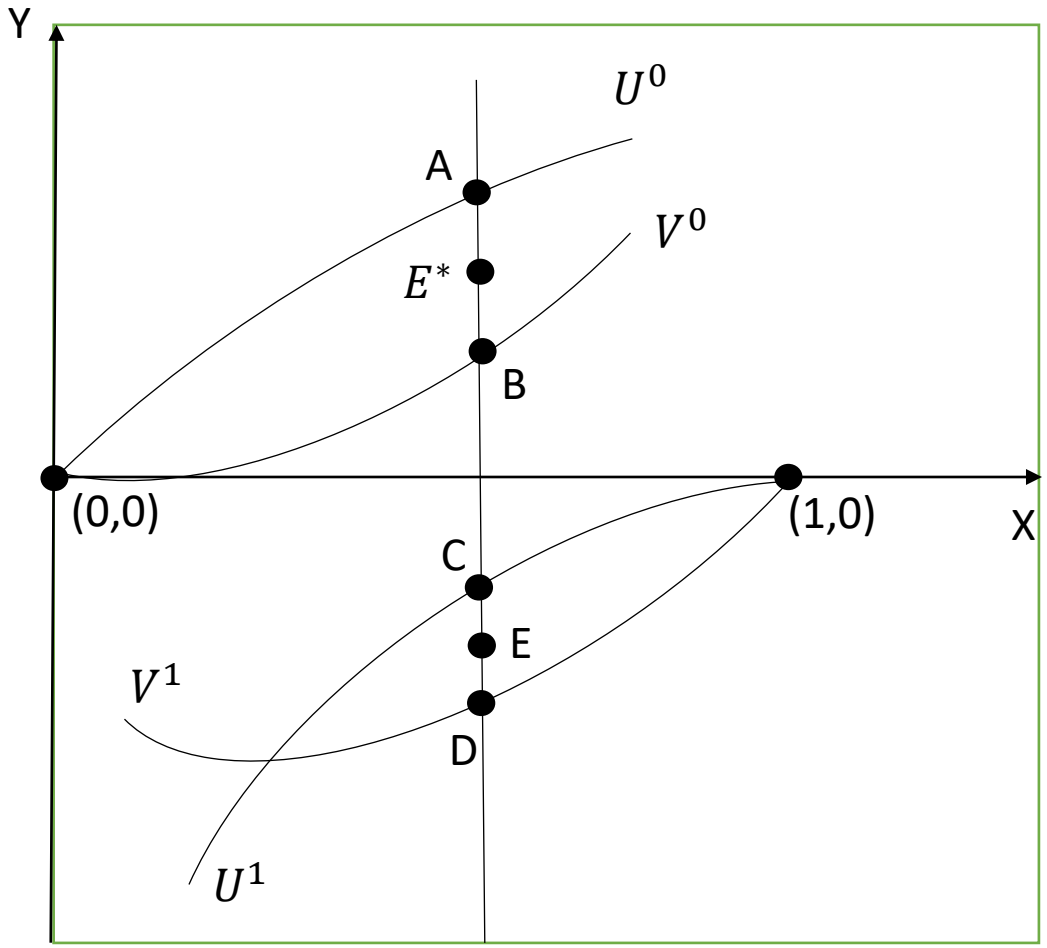

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4.3.1 Ownership structure

- **Ownership structure** specifics who has the ownership rights.
- Ownership rights determine the decision as well as income rights.
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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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- **Large numbers** of consumers and producers are *not necessary* to establish **efficiency** !!
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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.
- If bargaining is fully efficient then there is no need for the organization since NO co-ordination and motivation problems are there.
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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.
- Besides the price and quantities in markets, now the allocation of ownership rights and the design of contracts have received attention.
- Institutional costs, which are associated with the management of organizations and the design and execution of contracts are neglected.

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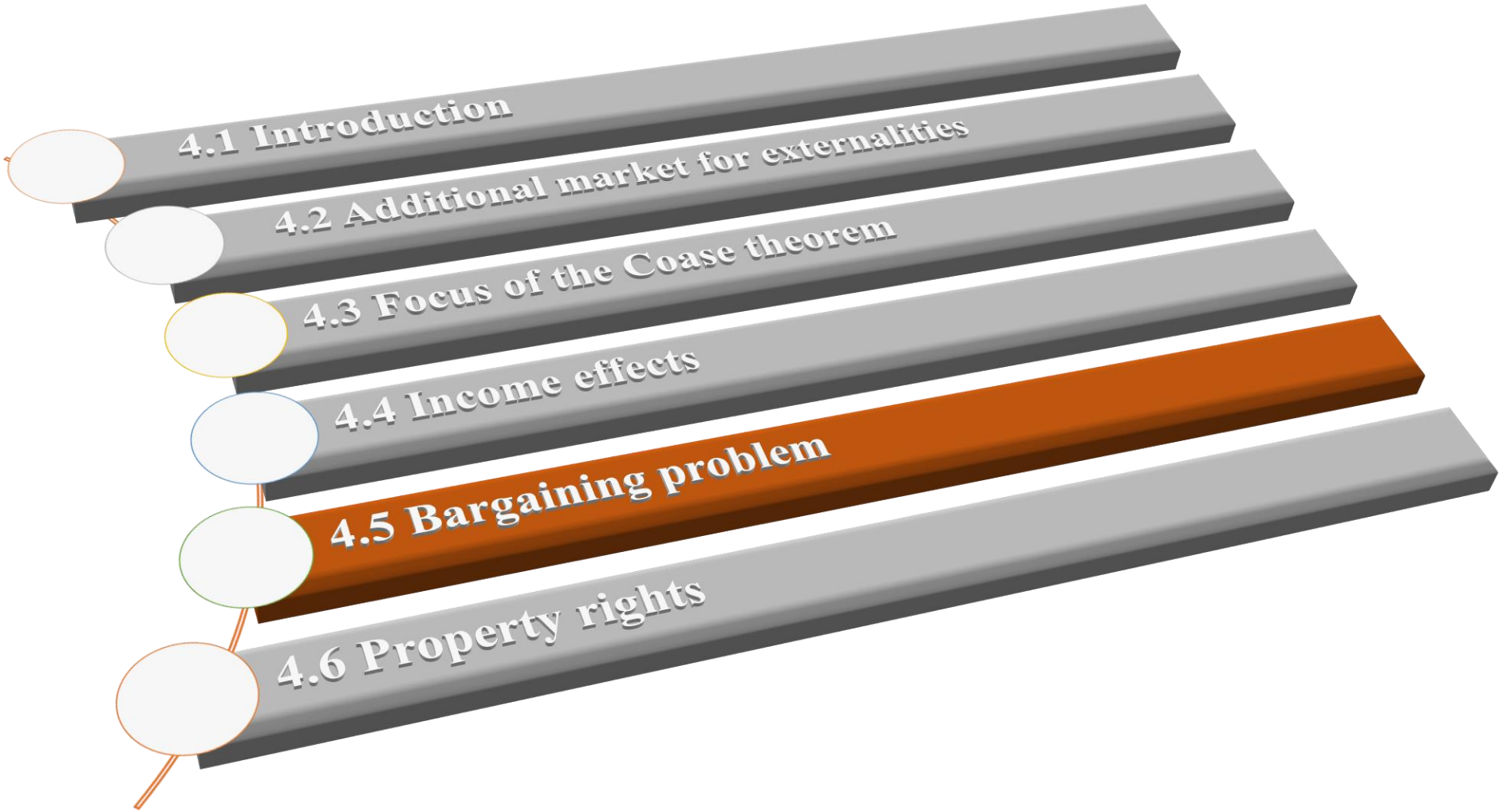
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4.5.1 One-sided asymmetric information

- 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.

(This concentration of bargaining power entails that this party receives the entire 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 !!

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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— **Public organizations** might own many characteristics of an **inefficient control structure**.

— **Decisions** are **divided** between many managers and politicians.

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Plan


4.1 Introduction
4.2 Additional market for externalities
4.3 Focus of the Coase theorem
4.4 Income effects
4.5 Bargaining problem
4.6 Property rights

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