Lecture 11: Externalities, institutions and optimality (1) - Property rights and transaction costs

- Purpose
  - ► demonstrate the role of institutions on what becomes optimal
  - ► modify the "conventional economics wisdom" that property rights solves all environmental problems

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1:18

Outline

- A brief history on the evolution of externality and optimality perspectives

- Transaction costs

- The impacts of (property) rights on optimality

- The impact of WTP vs. WTA

- Optimality - no intervention, tradable emission permits or emission taxes
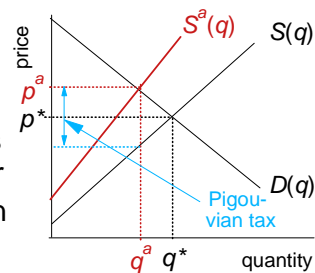
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History on TC and property rights (1)

- **Pre-environmental economics**
  - ► Pigou (1920s)
    - → in some cases market prices do not capture all that matter
    - → proposed solution: Pigouvian tax
  - ► Arrow-Debreu (1950s)
    - → under well defined property rights, complete markets and full information (rational expectations suffice) markets yield Pareto-optimal outcomes
    - → implication: market (policy) failure a matter about property rights or completeness of markets

Chart labels: price, $S^a(q)$, $S(q)$, p^a, p^*, Pigouvian tax, $D(q)$, q^a, q^*, quantity

3:18

... on TC and property rights (2)

- **Externalities and property rights**

  - ► Bator (1958): externalities caused by market failure (= incomplete markets)

  - ► Coase (1961): if TC = 0 the only role of government is to specify property rights
    - → ... and economic agents will negotiate the optimal solution

  - ► Dahlman (1979): externalities due to TC
    - → if TC = 0 and property rights fully defined, all (Pareto relevant) externalities should be internalized

4:18

... on TC and property rights (2)

- Transaction costs and tradable permits
  - ► Dales (1968) & Montgomery (1972)
    - ➡ necessary condition for trades of pollution = assign property rights to pollution
    - ➡ start of tradable permit markets

- Experiences with tradable permits:
  - ► Hahn 1987: policy makers have used TPs in a limited and naive sense
  - ► Goulder 2014:
    - ➡ more empirical experiences
    - ➡ institutions and organization matter

5:18

Transaction costs (1)

- The starting point - Coase (1937 - The nature of the firm):
  - ► Why are there command like structures like firms if markets are costless to run?
  - ► Remark: in modern theories of organizations - an increased focus on "internal markets"

- Coase (1960): uses the term TC but does not formally define TC
  - ► in the "social cost paper" used to exemplify the costs of negotiating away the externalities in question

6:18

... transaction costs (2)

- Arrow (1969): TC are the "costs of running the economic system"

- Dahlman (1979): TC = costs of information gathering, contracting and controlling contracts

- North and Thomas (1973): economic perfor-mance depends on insitutions, and the tradeoff TC and establishment of property rights
  - ▸ institutions from (negotiation) games (Bromley 1989, North 1990)
  - ▸ institutions as equilibria (Aoki 2001)

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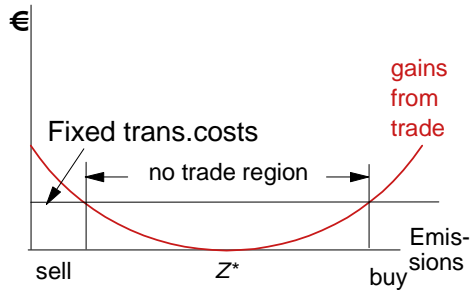
Optimality and property rights (1)

- TC < welfare gains from trade $\Rightarrow \{p^*, z^*\}$
  - ▸ rights with polluter $\Rightarrow$ welfare gain from trade = area B
  - ▸ rights with "victim" $\Rightarrow$ welfare gain from trade = area A

- Fixed TC and TC > welfare gains
  - ▸ rights with polluter: z_p
  - ▸ rights with "victim": z_v
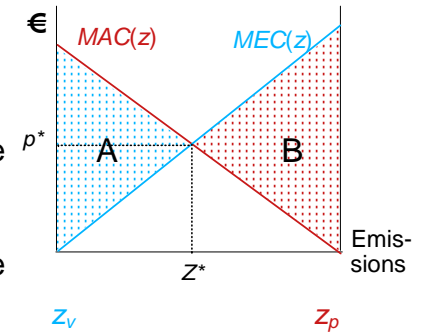
8:18

... optimality and property rights (2)

- Fixed TC:
  - ▸ small gains from trade ⇒ gains < fixed trans. costs ⇒ no trade in an interval

gains from trade

Fixed trans.costs

no trade region

€

sell Z^* buy

Emis-sions

- Fixed TC influences if transaction takes place, but not the equilibrium given that transaction occurs

9:18

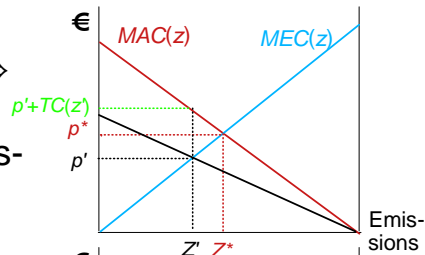## ... optimality and property rights (3)

- Fixed TC
  - ▸ no trade if inital firm allocations close to ⇒ individual firm gains < fixed costs ⇒ welfare losses compared to optimum

€   MAC(z)   MEC(z)

p^* A   B

Emis-sions

z_v Z^* z_p

no trade region

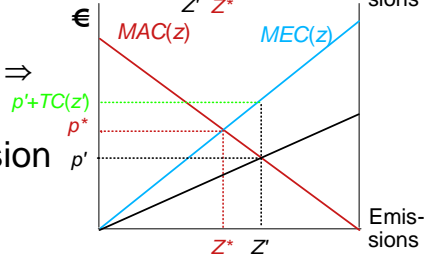 - ▸ if inital allocations differ from firm optima, this impact not as large
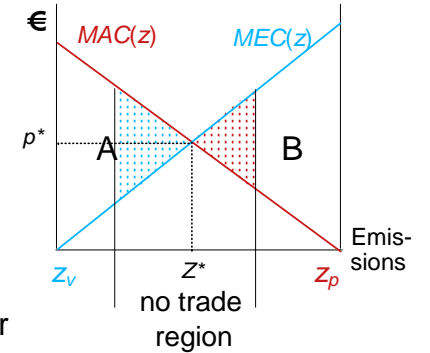
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... optimality and property rights (4)

- Variable TC Case 1: "Victim" has the right $\Rightarrow$ polluter's costs $\uparrow$ $\Rightarrow$ polluter's effective emission rights demand $\downarrow$
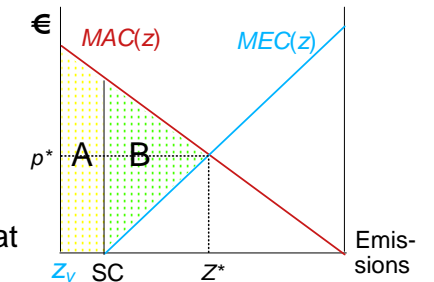
- Variable TC Case 2: "Polluter" has the right $\Rightarrow$ victim's costs $\uparrow$ $\Rightarrow$ victim's effective emission rights demand $\downarrow$

11:18

... optimality and property rights (5)

- Consider MEC(z) with self cleaning capacity (SC) and fixed TC
- Assume "victim" has the right
 - ▸ It matters if rights are at z_v or SC?
- Reason for choosing
  - ▸ SC : costless for "victim" to give away area A, but then TC > B $\Rightarrow$ no transaction (we remain at SC)
  - ▸ z_v : the costs for the polluter of contracting less than gains (TC < A+B) $\Rightarrow$ transaction (move to z^*)

12:18

WTP vs. WTA and optimality

- WTP < WTA can be used to illustrate the rights issue
  - ▸ victim has the right ⇒ victim perceives giving up absence of emissions in a WTA framework
  - ▸ polluter has the right ⇒ victim perceives aquiring emission rights in WTP framework
- WTA frame rotates the MEC-curve counter clockwise ⇒ $z_{WTA} < z^*$ (non-TC equilibrium)
- Same arg for WTP frame ⇒ $z_{WTP} > z^*$
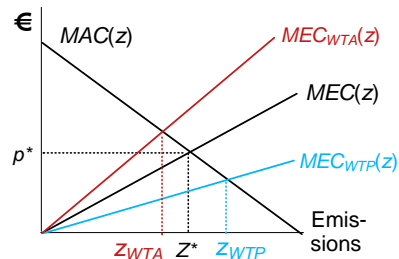
13:18

Optimality revisited (1)

- We have seen that
  - ▸ rights and TC matter for what becomes optimal
  - ▸ there are potential welfare losses associated with having rights regimes that lead away from the non-TC equilibrium $\{p^*, z^*\}$

- Can we get closer to $\{p^*, z^*\}$ by choosing "smart(er)" institutions than the Coasian bargaining solution?
  - ▸ yes, unless we are in a WTA or WTP frame (as these perceptions are real enough for agents)
  - ▸ in the case of WTA, there can be options values involved

14:18

... optimality revisited (2)

- Consider the "institution" emission tax
  - ► polluters do not have to deal with victims (who may be many and "contracting" with each $\Rightarrow$ TC $\uparrow$)
  - ► the government "represents" victims, and polluters only have to relate to the emissions tax rate $\Rightarrow$ the optimal equilibrium $\{p^*, z^*\}$ reached provided that government represents victims in a proper way

- Problematic areas
  - ► victims' tolerance (preferences) for emissions may differ - who should government represent?
  - ► government not as "good hearted" as we like to believe $\rightarrow$ public choice

15:18

... optimality revisited (3)

- Consider the "institution" tradable permits
  - ► polluters do not have to deal with victims (who may be many and "contracting" with each victim may involve large TC) [same as for the tax]
  - ► the government "represents" victims, and polluters only have to relate to the emission permit price $\Rightarrow$ the optimal equilibrium $\{p^*, z^*\}$ is reached pro- vided that government represents victims ...

- Problematic areas - same as for tax

16:18

Summary

- Rights matter

- TC and rights influence what is optimal

- If "only" a matter of TC, institutions can be "rigged" to get $\{p^*, z^*\}$ = argument for government intervention

- In WTA / WTP frames these influences are real
  $\Rightarrow$ institutional design more difficult
  - ... but by moving away from where WTP/WTA most likely to be present (= victim side) one may reduce the deviations from $\{p^*, z^*\}$ $\Rightarrow$ regulate polluting firms
  - additional benefit : coincides with fairness perception of polluters pay

17:18

Concept questions

1. Consequences of incomplete property rights to pollute
   - unclear if polluters have right to pollute AND
   - unclear if victims have right to pollution free environment

2. What is the likely correction to (1) in a
   - democracy
   - a dictatorship

3. Combine model illustatrations for fixed costs (slide 8-9) and variable costs (slide 10) to assess the impact when both fixed and variable TCs present

18:18