The Coase Theorem

Lecture 9

- Ronald Coase (1960)
  - Centered the issue around property rights
  - Neutralizes the notation of blame
  - Nobel Prize
  - Law & Economics

- The question Coase asked is whether the efficient outcome would result if either
  - the right to clean air is assigned to the residents
  - the right to pollute is assigned to the factory

- Under zero transaction cost and positive transactions cost

Hi Ron!

- Coase Theorem using a numerical example
  - Consider a factory whose smoke causes damage to a laundry hung outdoor by 5 residents
  - In the absence of corrective action each resident suffers damages of $75 (5*$75 = $375)
  - Smoke damage can be eliminated in two ways:
    - Smokescreen installed by factory at cost of $150
    - Electric driers used by each resident at cost of $50 each for a total cost of 5*$50 = $250

- Summary
  - Damages = $375
  - Smokescreen = $150
  - Driers = $250

- Efficient solution is to install smokescreen
  - It is less than the damages $150 < $375
  - It is less than the driers $150 < $250
  - Net social gain is $225 = $375 - $150

- Case 1: Zero Transaction Costs
  - Right is assigned to residents
    - Factory has 3 choices:
      - Pollute and pay $375
      - Install smokescreen and pay $150
      - Purchase driers for resident and pay $250
  - Right is assigned to factory
    - Residents has 3 choices:
      - Nothing and pay $375
      - Purchase driers and pay $250
      - Install smokescreen for factory and pay $150

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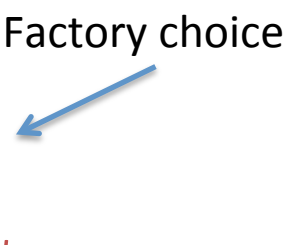

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      - Nothing and pay $375
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  - Right is assigned to factory
    - Residents has 3 choices:
      - Nothing and realize loss of $375
      - Purchase driers and pay $250
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- Case 2: Positive Transaction Costs
  - Suppose it costs each resident $60 to get together (trans cost)
  - Right is assigned to residents
    - Factory has 3 choices:
      - Pollute and pay $375
      - Install smokescreen and pay $150
      - Purchase driers for resident and pay $250
  - Right is assigned to factory
    - Residents has 3 choices:
      - Nothing and pay $375
      - Purchase driers and pay $250
      - Install smokescreen for factory and pay $150 + $300

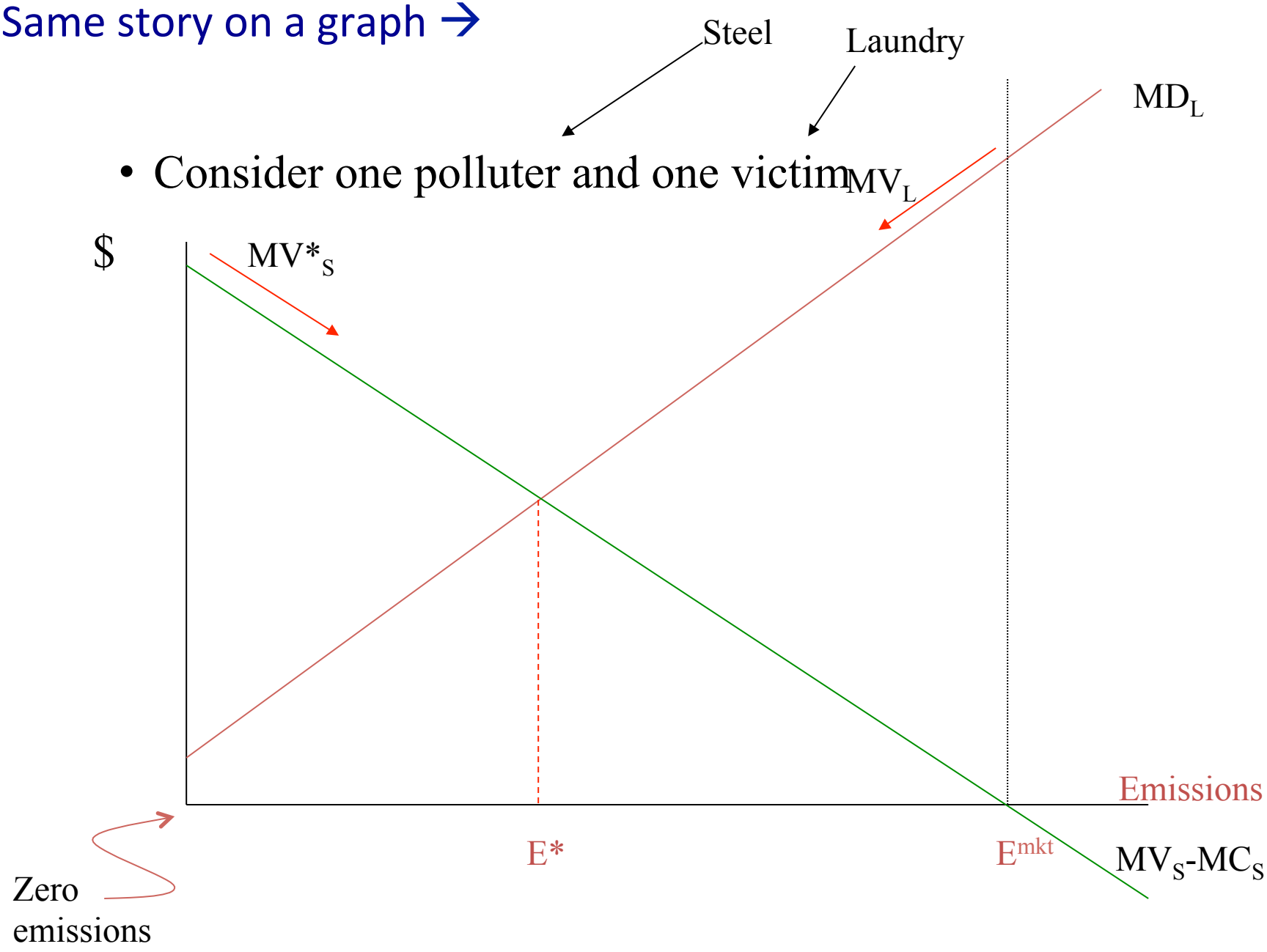
Transactions cost

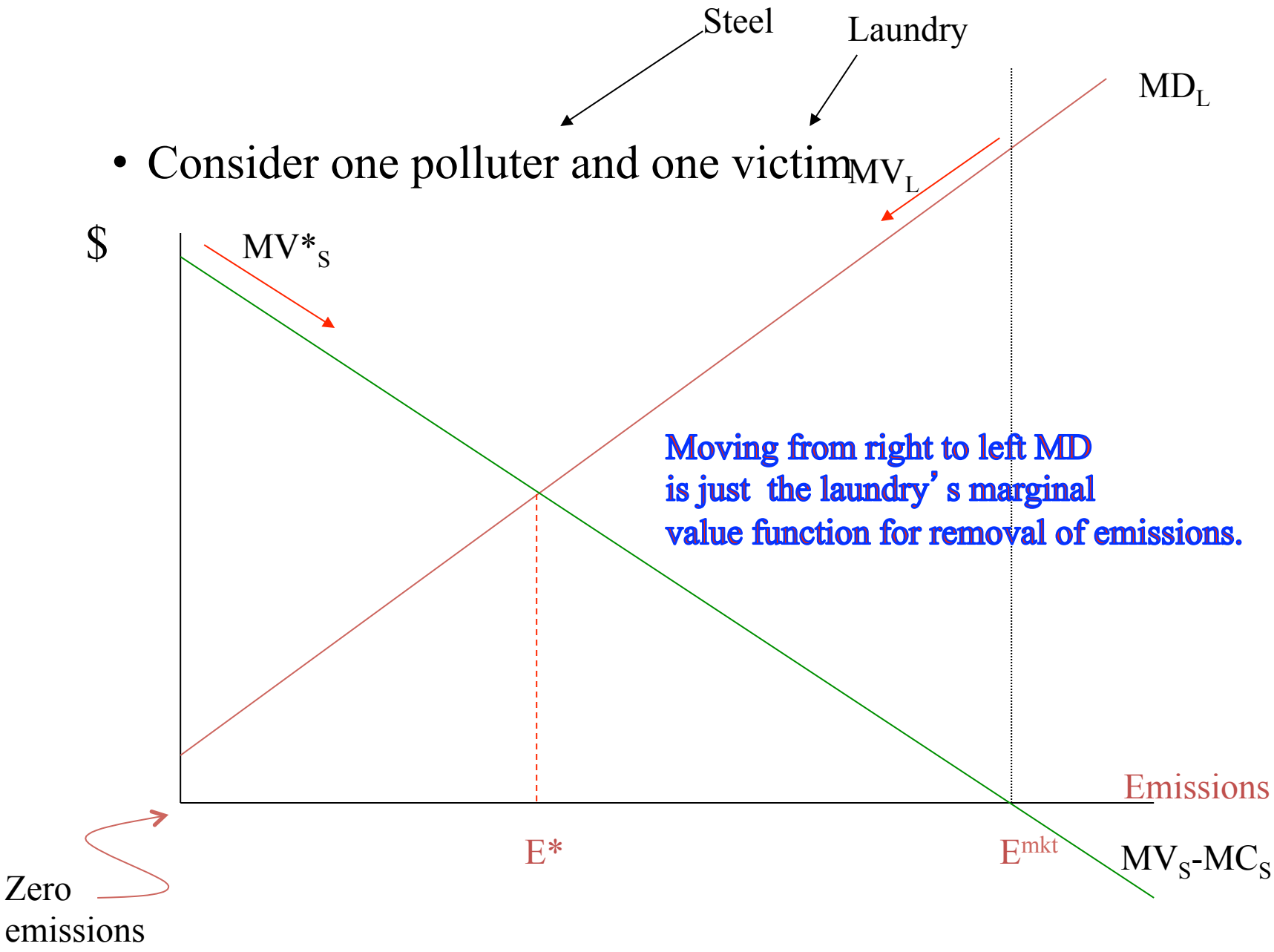
- Case 2: Positive Transaction Costs
  - Suppose it costs each resident $60 to get together (trans cost)
  - Right is assigned to residents
    - Factory has 3 choices:
      - Pollute and pay $375
      - Install smokescreen and pay $150
      - Purchase driers for resident and pay $250

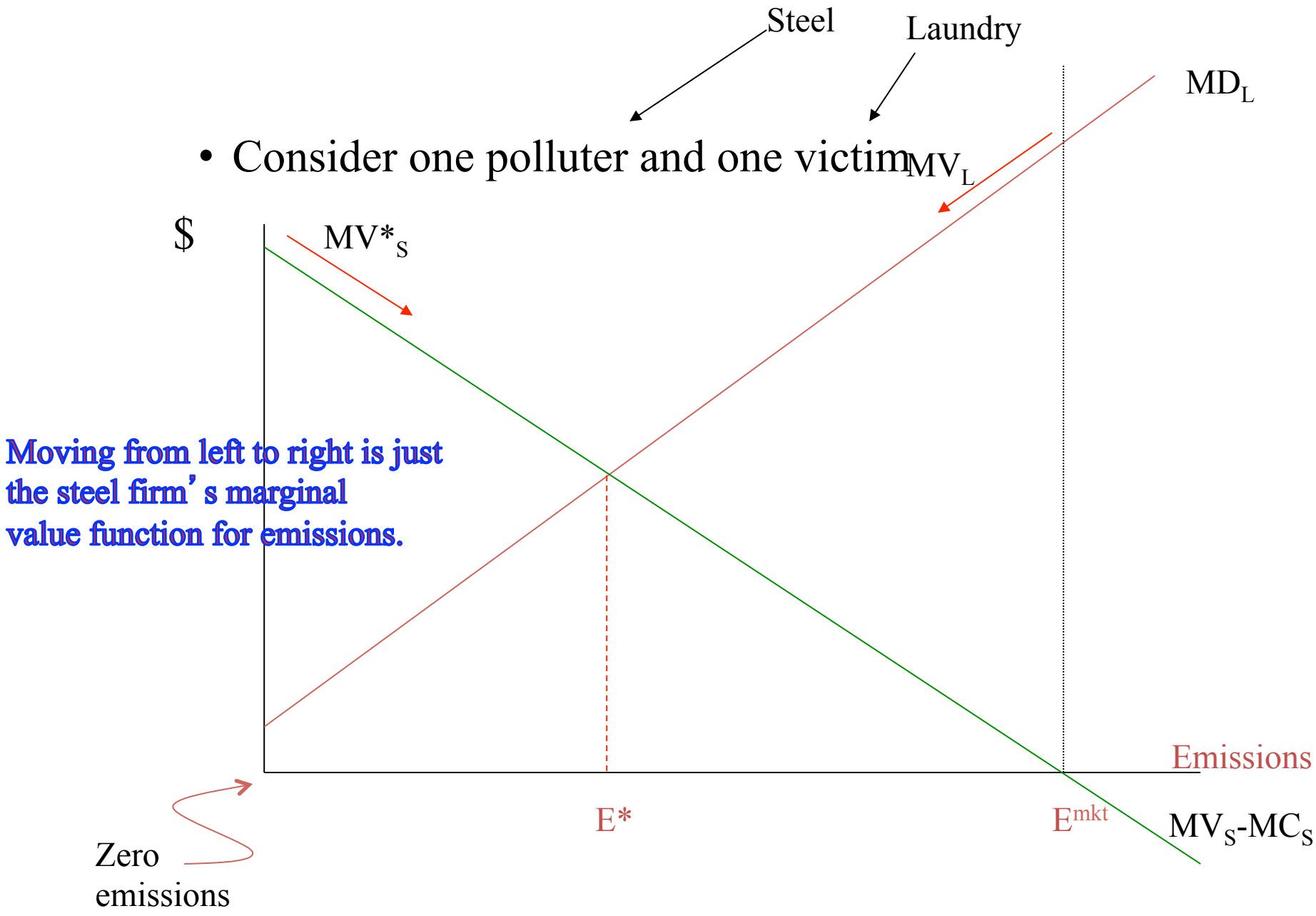
Assign Rights to Residents is Efficient Social Rule

  - Right is assigned to factory
    - Residents has 3 choices:
      - Nothing and pay $375
      - Purchase driers and pay $250
      - Install smokescreen for factory and pay $150 + $300

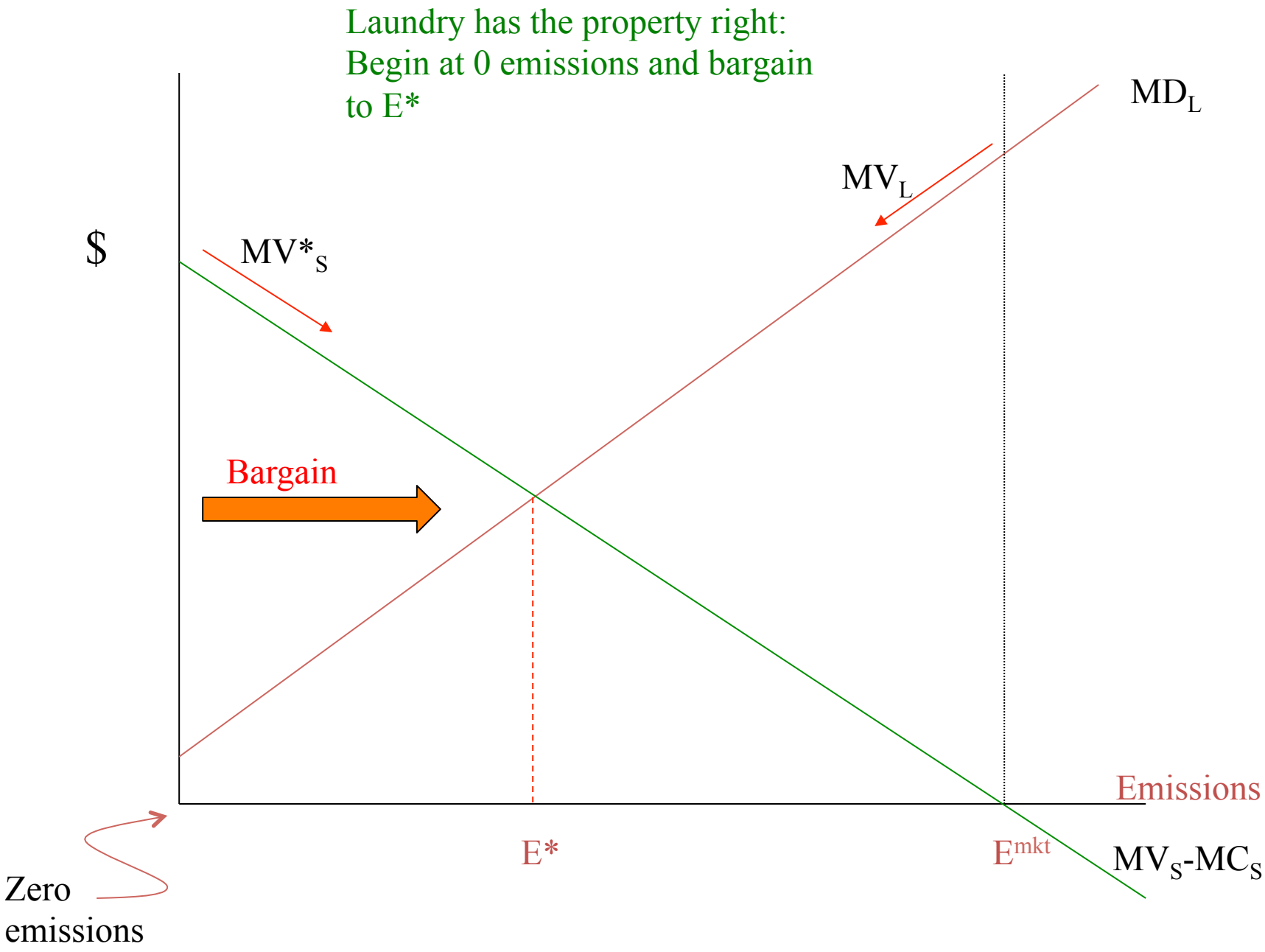
Same story on a graph →



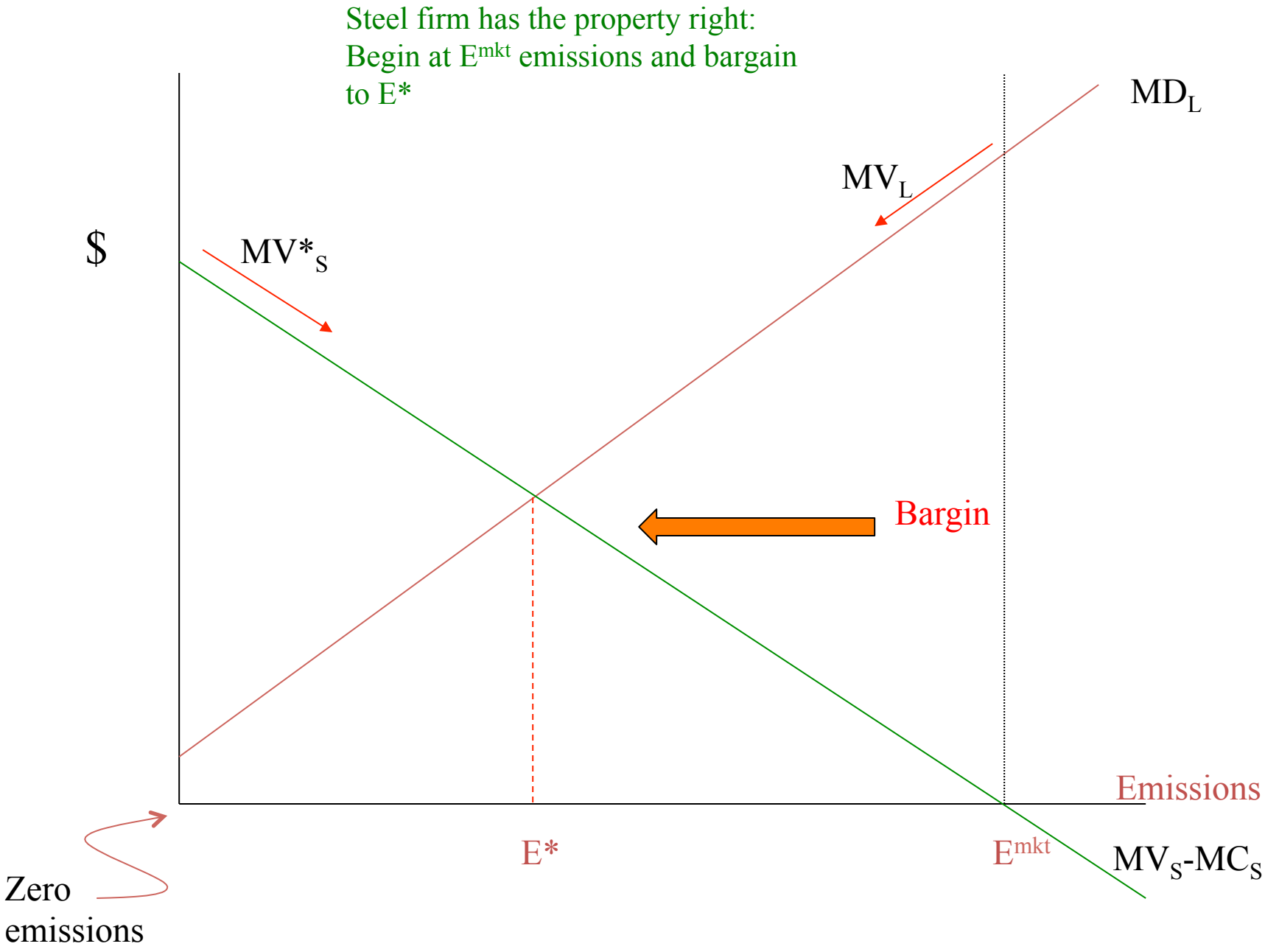

Steel
Laundry
MD_L
• Consider one polluter and one victim
MV_L
$
MV^*_S
Moving from right to left MD is just the laundry's marginal value function for removal of emissions.
Emissions
E^*
E^{mkt}
MV_S-MC_S
Zero emissions


Steel
Laundry
MD_L
• Consider one polluter and one victim
MV_L
$
MV^*_S
Moving from left to right is just the steel firm's marginal value function for emissions.
Emissions
E*
E^{mkt}
MV_S-MC_S
Zero emissions

- First, assign property rights to the laundry
  - At zero emissions, $MV^*_S > MV_L$
  - Why wouldn't the steel firm attempt to enter into a deal with the laundry wherein they would compensate the laundry for polluting the lake somewhat?
  - It stands to reason that the firms would bargain an increase in pollution until E=E*.


Laundry has the property right:
Begin at 0 emissions and bargain to E*
$
MV*S
MVL
MDL
Bargain
Emissions
E*
Emkt
MVS-MCS
Zero emissions

- Second, assign the property rights to the steel firm
  - At E^{mkt} emissions, $MV_L > MV^*_S$
  - Why wouldn't the laundry attempt to enter into a deal with the steel firm wherein they would compensate the steel firm for reducing pollution somewhat?
  - It stands to reason that the firms would bargain an increase in pollution until $E^{mkt}=E^*$.


Steel firm has the property right:
Begin at E^mkt emissions and bargain to E*
MD_L
MV_L
$
MV*_S
Bargin
Emissions
E*
E^mkt
MV_S-MC_S
Zero emissions

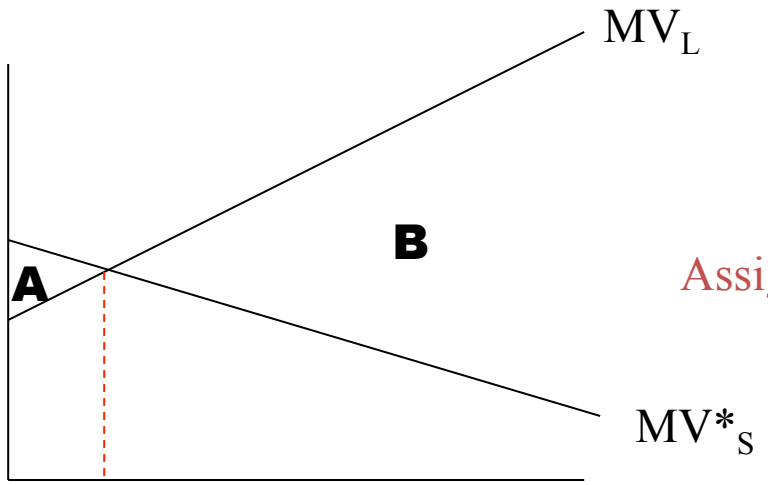
- Coase Theorem So long as property rights are assigned (does not matter who gets them), the efficient level of emissions will be attained.

- Issues
  - Equity & Wealth effects
  - Transactions Costs (large number of victims)
    - Cost of Coming Together
    - Free Riding/Preference Revelation
    - Bargaining with Groups

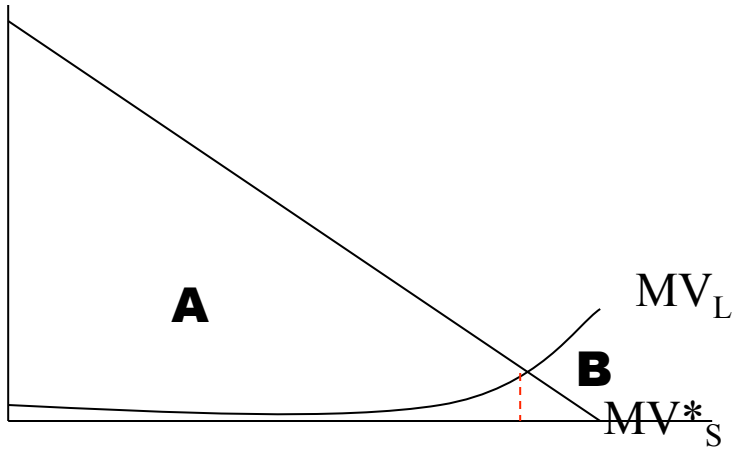
- Coase Theorem w/ Tranactions Costs
  - The Theorem guides use to assign property rights so as to minimize transaction cost.

When transaction costs are present, it does matter where the rights are initially invested. With transaction costs, the status quo tends to prevail. This means that when rights are initially established by the legal system, it is important to vest rights in those parties that have the greatest need for those rights. One should not rely on trade to redistribute rights to pollute. Of course another conclusion may be that attention should be paid to reducing the transaction costs associated with trading rights to pollute.

- Two simple cases:



Assign to Laundry



Assign to Steel

- Policy significance
  - Examples
    - Cattle fatten facility in CA
    - Perrier in France
    - Nature Conservancy
    - Alaska story
  - Liability Rules
  - Cap and trade