



# Econ 201: Introduction to Economic Analysis

**October 26 Lecture:  
Externalities**



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# Daily dose of The Far Side

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“Henry! Our party’s total chaos! No one knows when to eat, where to stand, what to ... Oh, thank God! Here comes a Border collie!”



# Preview of this class session

- Externalities occur when one agent's decisions affect others (beyond changing prices)
- Externalities lead to inefficiency because only the private (not external) effects of decision are considered
- Abatement of pollution is expensive, so we must balance costs and benefits to see the optimal level of pollution
- There are various policy approaches to trying to internalize externalities
- The Coase Theorem asserts that private agents may be able to internalize without policy intervention
- The tragedy of the commons is an externality problem



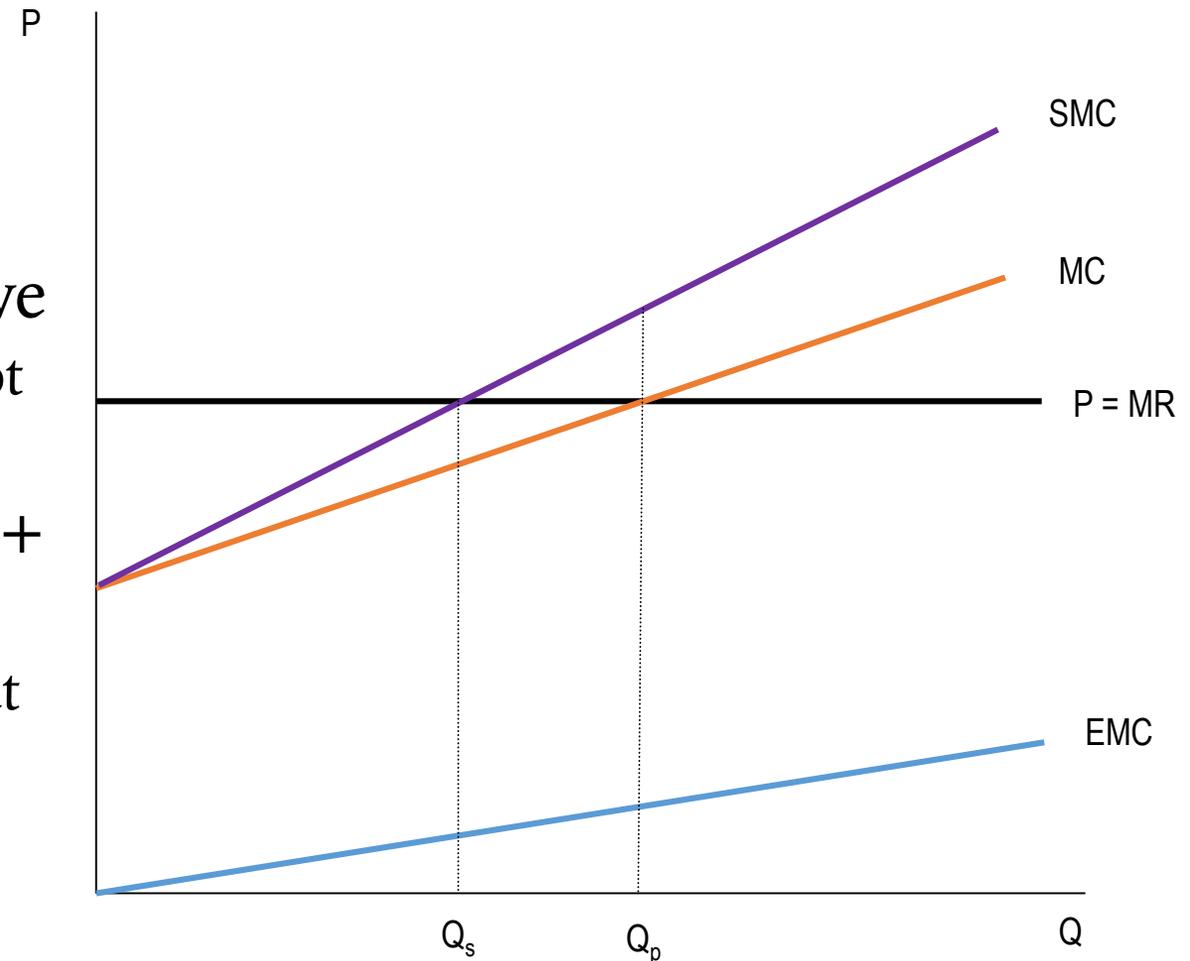
# Private, social, and external costs/benefits

- Firms make decisions based on the costs and benefits to them: **private costs and benefits**
- We have assumed that all of the costs and benefits (revenues) from production accrue to firm deciding on output
  - Sometimes there are **external costs or benefits** that accrue to other firms or households
- **Social costs/benefits** are the sum of private and external
- Socially optimal outcome requires that decisions be based on balancing social MB with MC
  - The firm will not do this if there are externalities that it does not consider
  - Outcome is usually inefficient resource allocation



# Social costs and inefficiency: Example

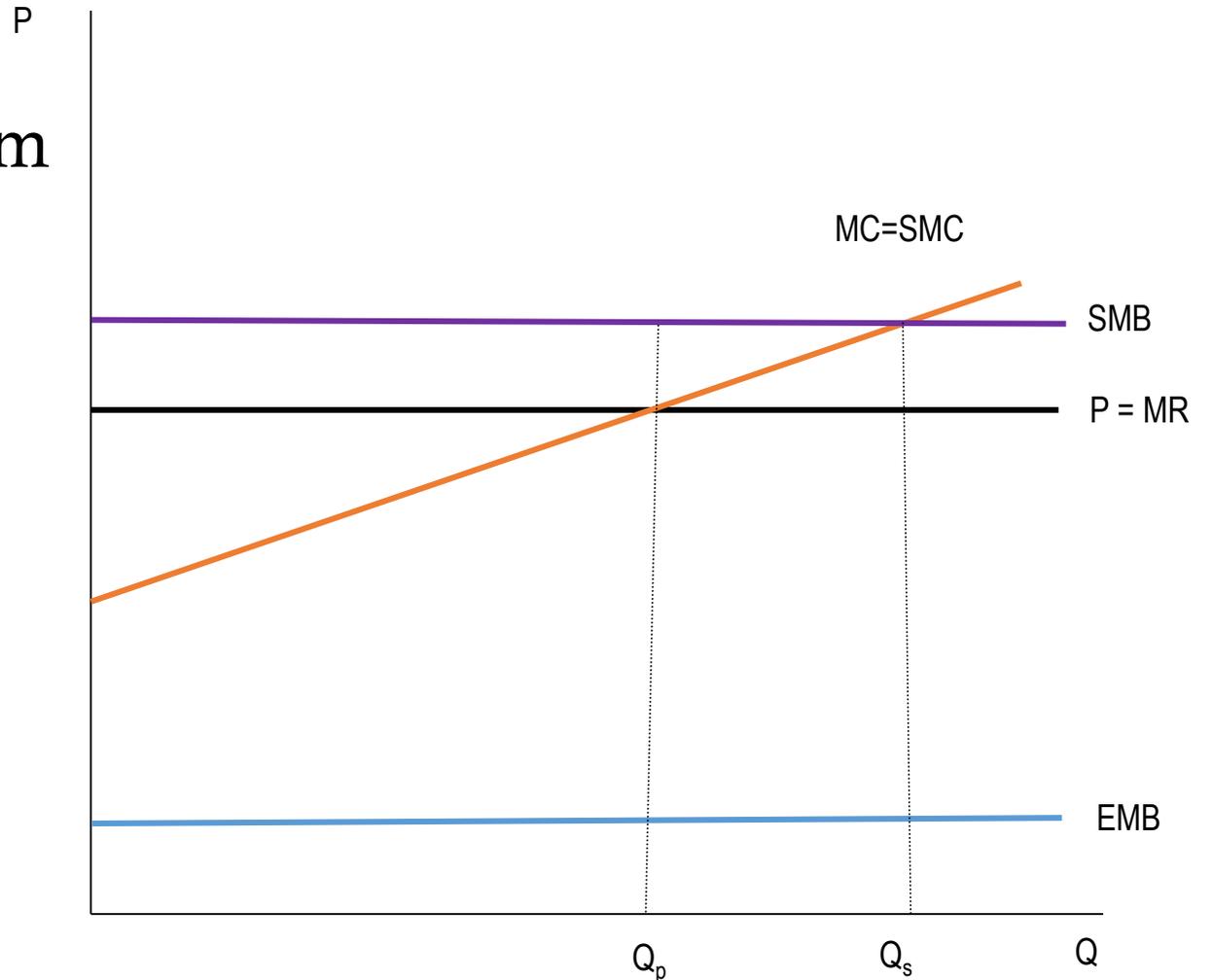
- Perfect competition
  - Firm chooses  $MR = MC$  (private)
  - Produces  $Q_P$
- **External marginal cost** = EMC curve
  - Note that this must be *marginal* cost, not fixed cost
- **Social marginal cost** is  $SMC = MC + EMC$ 
  - Optimal choice is where  $MR = MCS$ , at  $Q_S < Q_P$
- Deadweight loss is triangle between MR and SMC over gap in  $Q$





# External benefits?

- What if others get benefit from firm's production?
- $SMB = EMB + MB (P)$
- Private choice is  $Q_P$  (again)
- Optimal social choice is  $Q_S$ , where marginal social benefit = marginal (social) cost
- Deadweight loss is triangle between SMB and SMC over shortfall in  $Q$





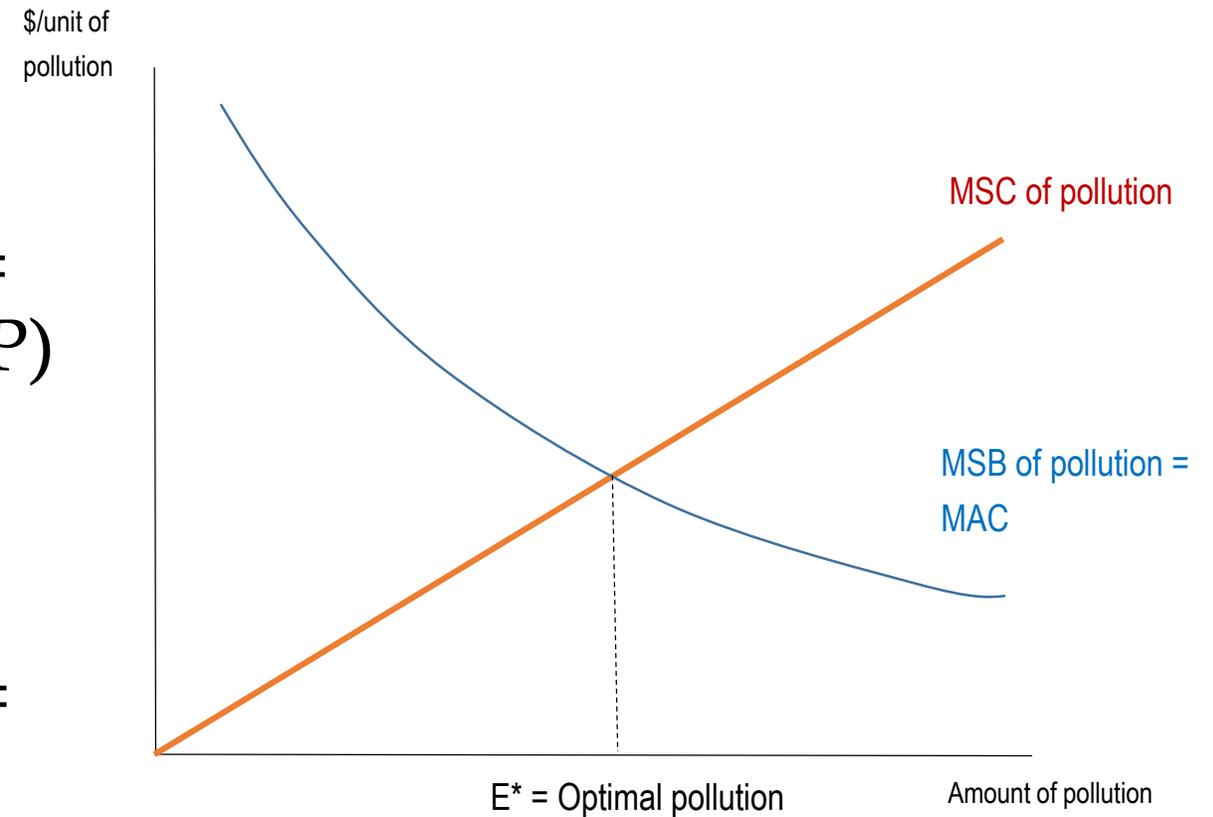
# Applications and implications

- Direct price effects are not externalities: ADM flooding market affected rivals only through price, so not externality
- Externalities can occur in consumption as well as production
  - Costs: Noisy neighbor, smoking near you
  - Benefits: Neighbor with beautiful garden/house
- Firms/consumers who cause external costs produce/consume more than socially optimal amount
- Firms/consumers who cause external benefits produce/consume less than socially optimal amount
- Perfect competition does not lead to efficient resource allocation with externalities: **market failure**



# Efficient amount of pollution

- Marginal social cost of pollution (MSCP) slopes upward
  - \$/unit of pollution on vertical axis
  - No one notices a little pollution
- Marginal abatement cost (MAC) = marginal benefit of pollution (MBP) slopes downward (in pollution)
  - Use resources or forgo  $Q$  to abate
  - Easy to abate “low-hanging fruit”
- Optimal pollution:  $MCP = MBP = MAC$
- What would shift curves?





# Policy choices

- Emission standard
  - Set max emission allowed at  $E^*$
  - What if some firms have lower abatement costs than others?
    - We'd want the low-cost firms to abate first
- Pigovian taxes
  - Set fee at equilibrium EMC to internalize externality
  - Works with different abatement costs
- Cap and trade: transferable permits to emit pollutants
  - Issue aggregate  $E^*$  in total permits
  - Exchange assures efficiency in meeting total emission target
  - Firms with high abatement costs buy from those with low costs



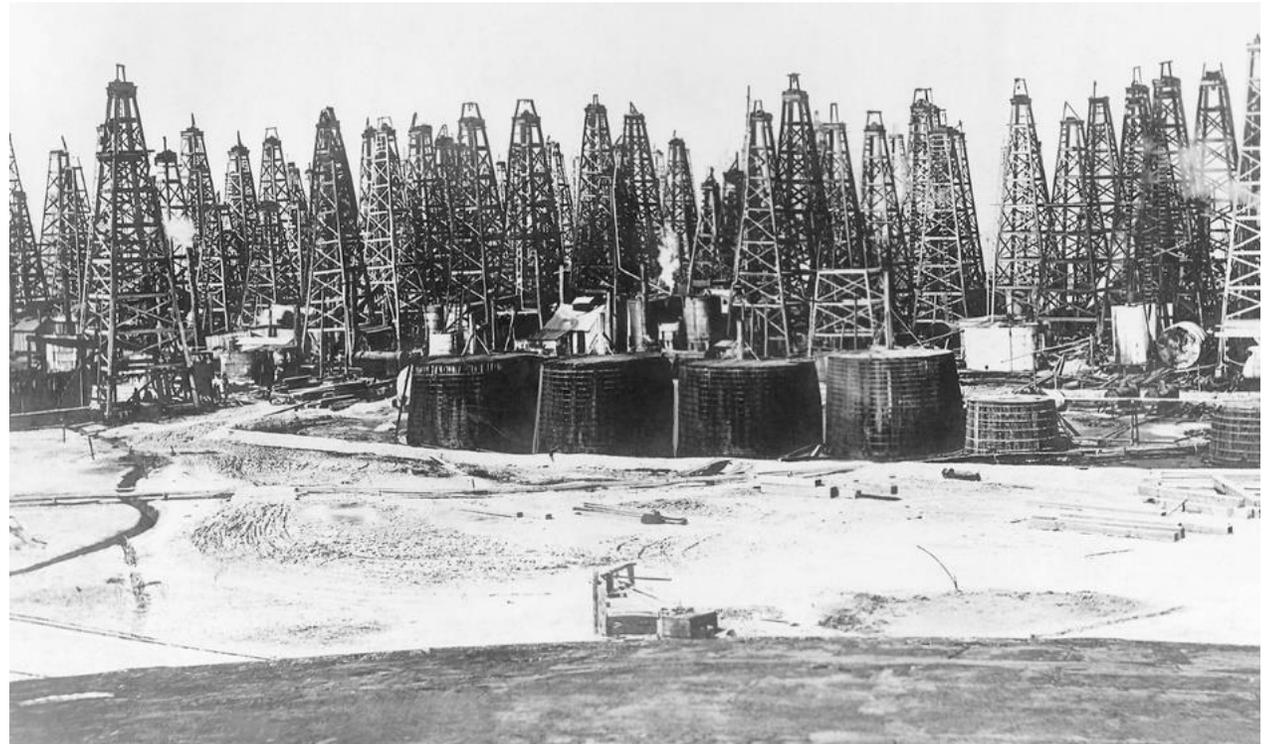
# Coase Theorem

- Property right to pollute or to clean environment?
- Either way, one party can negotiate with the other to achieve optimum
  - Right to pollute: Those damaged can pay polluter to stop
  - Right to clean: Polluter can pay damaged to allow pollution
- Need perfect information and costless bargaining
- GLS example: Wisconsin Business School alums did not want school to sell naming rights, paid \$85m to buy no naming for 20 years
- We will do example in conference of resolving a dispute between a factory and fishermen about keeping water clear for fish



# Tragedy of the commons

- Case study is example of tragedy of the commons
- Without clear property right, everyone has incentive to overuse common-property resources
  - Fish
  - Underground oil
- Private MC  $\sim 0$
- Social MC  $> 0$ 
  - EMC  $> 0 \rightarrow$  Overconsumption
- M&M experiment?



# Review

- Externalities lead to inefficiency because only the private (not external) effects of decision are considered
- Abatement of pollution is expensive so we must balance costs and benefits
- There are several policy approaches to trying to internalize externalities
- The Coase Theorem asserts that private agents may be able to internalize
- The tragedy of the commons is an externality problem





# Daily diversion

I learned last week of the passing of legendary Minnesota sports journalist Sid Hartman, who died at age 100 after an amazing 76 years of covering Minnesota sports. One eulogy that I read contained the following quote (perhaps not original with him), which seems to me to be the best “life advice” I can give you and, when I think about it, pretty much how I have lived my life.

“If you love what you do you’ll never work a day in your life.”



# What comes next?

- We continue our discussion of market failures on Wednesday by considering the case of public goods
- Problem Set #6 is due Wednesday
- Friday's class examines innovation and technological change, a favorite topic of mine
- There is a case study for Friday on appropriability and innovation