# OUTLINE — October 9, 2019

- Moral Hazard, briefly, wrapping up (reader helpful)
- Externalities *(also: a helpful video on Olney youtube)*
  - Definitions
  - Coase Theorem
  - Taxes & Subsidies (and what is "optimal")
  - Cap and Trade

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*MT reflection (look in "quizzes") due on bcourses tonight, 7 pm*
*PS3 due Gradescope & bcourses, Thurs 10/24 8 pm*

*See Tuesday afternoon email from Olney re possible shutdown*

# Moral Hazard

- When one party to a contract changes behavior after the contract is signed
  - Part of a transaction that takes time to complete
- Occurs after contract is signed

- *How careful will you be to not lose your cell phone?*

| | No insurance | With insurance |
|---|---|---|
| Extremely | 82 | 6 |
| Very | 13 | 22 |
| Somewhat | 2 | 46 |
| Not too careful | 0 | 24 |



# Moral Hazard

- Insurance
  - More careful or less careful?
  - Effect on cost of insurance?
- Bank Bailouts
  - More careful or less careful with risk?
  - Effect on likelihood of bank failure?
- Mortgage Rescue Plans
  - More careful or less careful with $ commitments?
  - Effect on likelihood of mortgage default?



# Solution: Monitoring

- Monitoring is a solution to moral hazard
  - Low-cost way to monitor behavior
  - Cancel contracts that are low-quality high-cost
  - Maintain contracts that are high-quality low-cost
  - Note: With perfect monitoring, there is no asymmetry in information

## Market Failure: Externalities

- Your activity affects someone else
- Negative externality
  - Cost borne by someone else
- Positive externality
  - Benefit received by someone else



## Positive Externality

- Benefits accrue to people who are neither the buyer nor the seller
  - *Education !*
- Private Marginal Benefit
- External Benefit (or, marginal external benefit)
- Social Marginal Benefit (or, marginal social benefit)



## Positive Externality



## Negative Externality

- Marginal Private Cost (or, private marginal cost)
- Marginal Damage Cost (or, external cost)
- Marginal Social Cost (or, social marginal cost)

## Negative Externality



## Coase Theorem

- Solution without government possible
- Requires
  - Well-defined property rights
  - No costs to bargaining
  - Only a few people
- Otherwise: government intervention



## Encourage behavior with subsidy

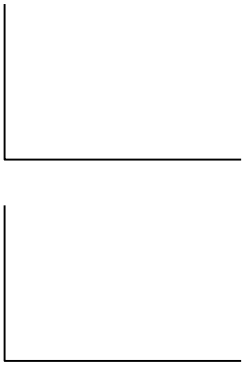
- Private market produces too little when there are positive externalities
- Encourage with subsidies
- Example: Prof. Olney buys $48 Bart ticket each month, paid through pre-tax payroll deduction
  - $3 paid by Bart
  - $10 paid by UC Berkeley
  - $10 paid by federal government
  - $3 paid by state government
  - Which means just $22 is paid by Prof. Olney



## Externalities & Taxes or Subsidies

- The challenge: what is the ***right (or, optimal) size*** of tax (negative externality) or subsidy (positive externality)?
  - It's positive (not normative) analysis
  - "Right" or "optimal" means generating socially optimal quantity

Negative Externality: A Tax



## Externalities & Taxes or Subsidies

- The challenge: what is the ***right (or, optimal) size*** of tax or subsidy?
  - It's positive (not normative) analysis
  - "Right" or "optimal" means generating socially optimal quantity
- Taxes discourage activity generating negative externalities
  - If Tax > MDC, then
  - If Tax < MDC, then
  - Only if tax = MDC, then
- What should the tax revenue be used for?
  - Offset (or, cover) costs represented by MDC



## When q=0 is socially optimal



## Driving & gas taxes

## Alternative Approach: Cap & Trade

- A market-based solution addressing negative externalities
- Authority determines total allowable pollution – the "cap"
  - Issues permission-to-pollute permits to manufacturers
  - One permit required for each "unit of pollution" generated
- Permits can be bought & sold – the "trade"
- Key assumption: manufacturers face different costs of reducing pollution
- Key characteristic: the price of permits will vary with S&D
- Key result: as cap is reduced (and price of permits rises), firms have economic incentive to reduce (abate) pollution rather than pay for increasingly expensive permits



## Cap & Trade: Pollution

- Suppose permits cost $500 per unit of pollution
- Firm A: Cost to abate (reduce pollution) = $200 per unit
  - What will they do?
  - Effect on profit?
- Firm B: Cost to abate = $900 per unit
  - What will they do?
  - Effect on profit?
- In the long run, which firms likely to exit industry?



## Costs of Abatement

- As price of permit rises…
  - Quantity demanded of permits (firms that will pollute)
  - Quantity supplied of permits (firms that will abate)



## Cap & Trade: Pollution