

# LECTURE 9: LIABILITY

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# April 20, 2010: Deepwater Horizon Explosion



# Economic Questions

- 4.9 million barrels of oil spilled.
  - Larger than Exxon Valdez.
  - Largest ever in US waters
  - Largest ever in the Gulf of Mexico.
  - 5<sup>th</sup> biggest oil spill in history
- **Questions:**
- What costs did the oil spill have?
- Could this disaster have been prevented?
- What environmental regulations was BP subject to?
- *Should* this disaster have been prevented?

Costs: 1.8 million gallons of dispersant



# Many miles of containment boom



# Controlled burns





# Ecological consequences: 6104 dead birds



Financial consequences: 87,000 miles of closed fisheries



Financial consequences: \$23 billion in lost tourism revenues



# White House Oil Spill Commission Report

- BP made nine mistakes
  - E.g. ignoring failed pressure test, failing to properly test cement strength
- “Better management of decision-making processes within BP and other companies, better communication within and between BP and its contractors and effective training of key engineering and rig personnel would have prevented the Macondo incident.”
- “The record shows that without effective government oversight, the offshore oil and gas industry will not adequately reduce the risk of accidents, nor prepare effectively to respond in emergencies. However, government oversight, alone, cannot reduce those risks to the full extent possible. Government oversight (see Chapter 9) must be accompanied by the oil and gas industry’s internal reinvention: sweeping reforms that accomplish no less than a fundamental transformation of its safety culture.”

# Oil Drilling Risk Management Regulation

- Oil company responsible for all cleanup costs incurred by government.
- \$75 million maximum liability for “economic damages”
  - Voided if firm found to be “grossly negligent,” “involved in willful misconduct,” or “in violation of federal regulations.”
  - Also can be voided by ex post facto laws.
- Oil Spill Liability Trust fund
  - Government-run insurance
  - Moral hazard?

# BP's Liability

- \$20 billion BP Spill Fund
  - 44,000 lost income claims
  - Estimated that only \$6 billion will be spent from this fund
- \$11.2 billion spent by October 1, 2010.
  - Includes the BP Spill Fund plus direct cleanup costs.

# Takeaways: Regulating Risk with Liability

- From an engineering perspective, it is clear ex post that steps could have been taken to prevent the spill.
- From an economic perspective, regulation may not have been far from optimal.
- The optimal risk of environmental damage is typically not zero.
  - i.e. the optimal number of oil spills may not be zero.
- BP/Transocean/Halliburton may (or may not) have been taking the social welfare-maximizing level of precaution.
- Interestingly, nobody asked whether this spill was “optimal.”

# von Neumann-Morgenstern Utility

- $U(x_A, x_B, \pi_A, \pi_B) = \pi_A u(x_A) + \pi_B u(x_B)$
- vNM utility is cardinal, not just ordinal.



# Irreversibility

- Imagine that a project has financial benefit  $B$  and cost  $C$ .
- Two periods:
  - Period 0: Decide whether to develop (D or ND)
  - Period 1: Information on environmental value of land is revealed.
    - Can develop in period 1 also.
- If land is valuable ( $V$ ), development has additional environmental cost  $E$ .
  - Probability of valuable =  $\pi$ .
- The project is an “irreversible investment”: It cannot be “unbuilt.”
  - But want to build soon: have discount factor  $\beta$ .
- What is the expected value if we need to develop now?
- What is the expected value if we can delay?

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