

Recapping Product Safety Regulation

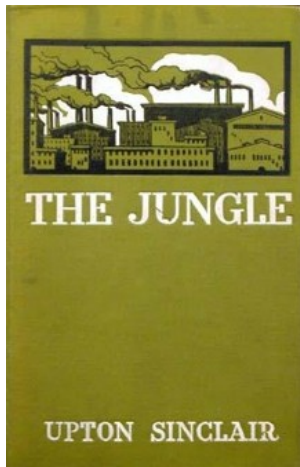
- We saw several ways in which product safety may be dealt with
- Markets will do some of the work for us: people will pay for safety, they won't pay for excessive safety
- When will markets fail us?
 - Incomplete information on part of consumer
 - Misperception of risk by consumer
 - Externalities

Solutions to these market failures:

- Inform consumers (product labels, ad campaigns, etc.)
- Use the courts (making companies liable for unsafe products)
- Direct regulation of safety (mandatory safety features, chemical bans, etc.)

Recapping Product Safety Regulation

- All of these approaches have their downsides
- Customers may not use the information you give them properly
- Courts can be costly, it can be hard to determine who is liable, excessive awards may lead to excessive caution (or lack of economic activity)
- Direct regulation can have unexpected behavioral effects and doesn't accommodate heterogeneous preferences
- Lots of uncertainty about costs and benefits of safety measures



Workplace Safety



- Many of the issues with product safety extend to workplace safety
- There are safety risks and reducing those risks involves a certain cost
- At issue is how to eliminate any units of risk for which the benefits of reduction exceed the costs
- There are some differences:
 - Different types of risks
 - Different market mechanisms: wages and option to quit rather than simply prices
 - More opportunities for learning
 - Different legal framework

- The most direct way that markets price risk in the workplace is through wages
- Wages don't just price characteristics of workers, they also price characteristics of the job
- In general, you get paid more if you are willing to do a less desirable job (bad hours, unsafe conditions, etc.)
- This is the theory of compensating differentials

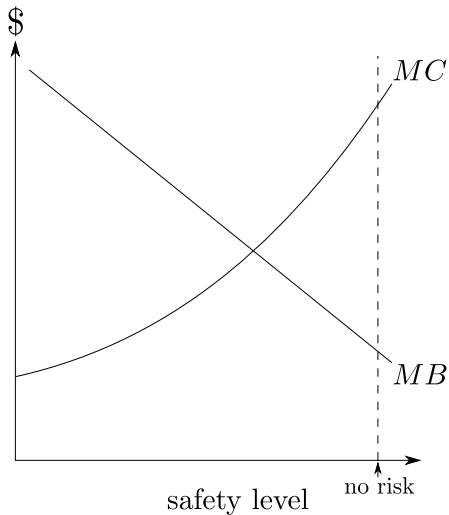
Compensating Differentials and Workplace Safety

Selected compensating differentials for job and worker characteristics, log hourly wage as dependent variable

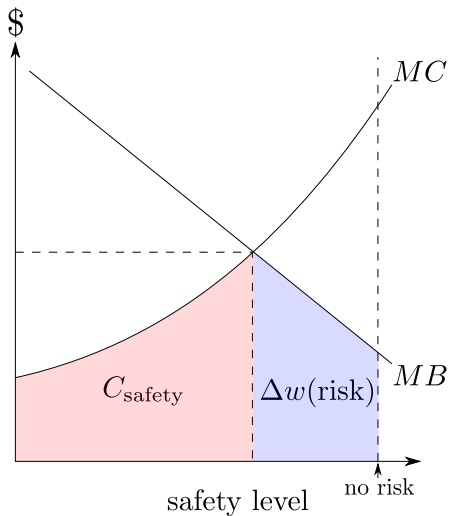
Variable	Females	Males
Years of education	0.0686 (0.0022)	0.0594 (0.0025)
Healthcare support	0.0133 (0.0341)	-0.2289 (0.0441)
Sexual harassment rate	0.0018 (0.0009)	0.0186 (0.0070)

From Joni Hersch, "Compensating differentials for sexual harassment*" (2011)

Compensating Differentials and Workplace Safety



Compensating Differentials and Workplace Safety



Compensating Differentials and Workplace Safety



- We do observe industries with higher accident rates having higher wages (controlling for other job and worker characteristics)
- The question is whether this gets us to the efficient level of workplace safety
 - Do workers know risks?
 - Safety versus health risks
 - How does bargaining power influence things?


Compensating Differentials and Workplace Safety

CUNYCARB
SODIUM BICARBONATE

INDUSTRIAL
U.S.P./FOOD CHEMICALS CODEX GRADE

SPILL: Sweep-up, place in an appropriate chemical waste container. Flush any spill with water. Observe official signs and labels and regulations regarding removal, spill cleanup, removal or discharge.

100 LB. NET WT. 45.4 kg.

 **CUNY CHEMICAL COMPANY**
CHEMICAL SYSTEMS DIVISION — NEW YORK, NY 10033

LOT NO.

CUNYLAC
CHLOROACETOPHENONE

**WARNING! LACHRYMATOR - VAPOR AND DUST
EXTREMELY IRRITATING**

UN 1697

IRRITANT

CHLOROACETOPHENONE, SOLID

•Do not breathe dust or vapor. •Wear a self-contained breathing apparatus, rubber gloves, and protective clothing when handling. •Use only with adequate ventilation. •Keep container closed. •Avoid contact with skin and eyes. •Wash thoroughly after handling.

FIRST AID: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth, if breathing is difficult, give oxygen. Call a physician.

•In case of contact, immediately flush eyes or skin with plenty of water for at least 30 minutes. Call a physician. Wash clothing before reuse.


•In case of contact, immediately flush the contaminated material for 15 minutes. If swallowed, immediately dilute the swallowed material by giving plenty of water. Do not induce vomiting or give anything by mouth to the victim with a finger or blunt object placed in the back of the throat. Continue first aid administration until hospital is contacted. Refer the victim to a physician or the nearest Poison Control Center immediately.

IN CASE OF FIRE: When heated emits toxic fumes. Wear self-contained breathing apparatus. Use water spray, foam, dry chemical or CO₂.

SPILL: Sweep-up, place in an appropriate chemical waste container. Flush area with water. Observe all signs, labels and federal regulations regarding disposal, spill cleanup, removal or discharge.

KEEP OUT OF REACH OF CHILDREN **FOR INDUSTRIAL USE ONLY**

100 LB. NET WT. 45.4 kg.

 **CUNY CHEMICAL COMPANY**
CHEMICAL SYSTEMS DIVISION — NEW YORK, NY 10033

LOT NO.

Figure 6.1 Chemical labels for the job risk study. Top: CARB.

Compensating Differentials and Workplace Safety

ASBESTOP
ASBESTOS

DANGER! CANCER HAZARD

Caution: Contains Asbestos Fibers • Avoid Creating Dust
• Inhaling Asbestos Dust May Cause Serious Respiratory Harm

• Use with a NIOSH/MSHA approved respirator • Use with approved goggles • Do not smoke or eat/drink • Wash thoroughly after handling, before eating and before leaving work • Change clothing often; do not wash work clothes at home.

SPILL: Sweep up; place in an appropriate chemical waste container. Flush area with water. Observe all local, state and federal regulations regarding disposal and cleanup; removal or discharge.


ORM - C
ASBESTOS

KEEP OUT OF REACH OF CHILDREN FOR MANUFACTURING USE ONLY

100 LB. NET WT. 45.4 kg.

LOT NO.

CUNY CHEMICAL COMPANY
CHEMICAL SYSTEMS DIVISION — NEW YORK, NY 10033



CUNY TNT
(Blend of Dry Trinitrotoluene)

DANGER! HIGH EXPLOSIVES
MUST BE STORED IN ACCORDANCE
WITH FEDERAL REGULATIONS

KEEP IN COOL, DRY, WELL VENTILATED, LOCK-UP
AREA. STOCK SHOULD BE ROTATED SO THAT THE
OLDEST MATERIAL IS USED FIRST.

KEEP OUT OF REACH OF CHILDREN
FOR INDUSTRIAL USE ONLY.



READ AND HEED THE PRODUCT SAFETY INFORMATION
SHEET ATTACHED.

100 LB. NET WT. 45.4 kg

EXPLOSIVE A
HIGH EXPLOSIVE
(FEDERAL DOT)

CUNY CHEMICAL COMPANY
CHEMICAL SYSTEMS DIVISION — NEW YORK, NY 10033

LOT NO.



SODIUM BICARBONATE. SPILL:
Sweep-up, place in an appropriate
chemical waste container...

CHLOROACETOPHENONE.
WARNING! LACHRYMATOR—
VAPOR AND DUST EXTREMELY
IRRITATING. Do not breathe dust or
vapor. Wear a self-contained breathing
apparatus...

ASBESTOS. DANGER! CANCER
HAZARD. Use with a NIOSH-Mesa
approved respirator. Use with ap-
proved goggles...

TNT—(blend of dry Trinitro-
toluene). DANGER! HIGH EXPLO-
SIVES. MUST BE STORED IN
ACCORDANCE WITH FEDERAL
REGULATIONS. KEEP IN COOL,
DRY, WELL VENTILATED, LOCK-
UP AREA...

Compensating Differentials and Workplace Safety

- Results from the Viscusi and O'Conner study
- Workers were shown the chemical labels, told they would be working with them
- Viscusi and O'Conner estimated how much workers demanded in a salary increase:
 - Sodium bicarbonate: \$0
 - Lachrymator: \$1,919
 - Asbestos: \$2,996
 - Trinitrotoluene: \$5,158

Compensating Differentials and Workplace Safety

Empirical estimates of risk premiums as a percentage of total earnings

Risk premiums of 3% to 5%

Petroleum refining
Tobacco manufacturers
Transportation equipment

Risk premiums of 6% to 9%

Textiles
Rubber and plastics
Leather and leather products

Risk premiums of 12%-15%

Food products
Furniture and fixtures
Lumber and wood products

Alternative Mechanisms for Achieving Safety

- There are two other big ways that workplace safety is regulated
- First is direct regulation of workplace conditions by OSHA
- The other major mechanism is workers' compensation
- These two approaches work in two very different ways and have very different benefits and drawbacks

The Occupational Safety and Health Act of 1970 was passed with the intention:

...to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources.

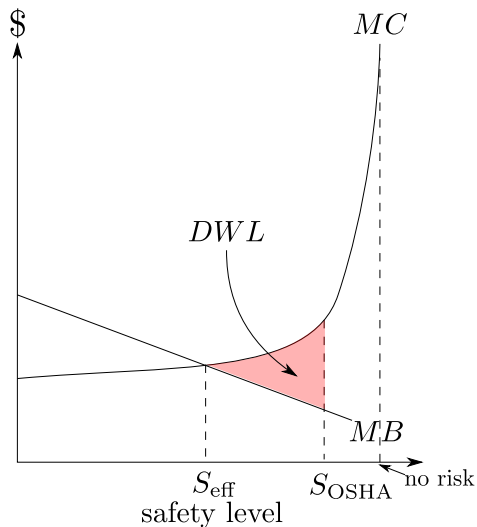
Note that this is a bit different than what we've been talking about with compensating differentials.

OSHA and the Direct Regulation of Safety

- OSHA requires certain safety standards and monitors for compliance
- Criticisms are that OSHA's regulations are inefficient and focused on things that are easily accomplished through compensating differentials
- Other criticisms are that OSHA has the wrong objective function
- Consider the language describing the employer duties mandated by the act

Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees...29 U.S.C. 654, 5(a)

OSHA and the Direct Regulation of Safety



Cost-benefit Analysis of Reducing Risk

Costs of risk-reducing regulations per expected life saved

Regulation	Year	Cost per		
		Cost per life saved (millions of 1995 dollars)	normalized life saved (millions of 1995 dollars)	Cost per year of life saved (millions of 1995 dollars)
Seat belt/air bag	1984	0.1	0.1	0.0
Underground construction standards	1989	0.1	0.1	0.0
Aircraft floor emergency lighting	1984	0.7	0.9	0.0
Children's sleepwear flammability ban	1973	1.0	1.2	0.1
Rear lap/shoulder belts for autos	1989	3.8	3.8	0.2
Asbestos occupational exposure limit	1972	9.9	24.7	1.2
Asbestos occupational exposure limit	1986	88.1	220.1	10.6
Hazardous waste land disposal ban	1988	4,988.7	12,462.7	597.4
Atrazine/alachlor in drinking water	1991	109,608.5	273,824.4	13,126.8

Workers' Compensation

- Other major mechanism is workers' compensation
- Workers' compensation is essentially a program requiring firms to insure against worker accidents
- Different states have different types of programs but every state has some form of workers' comp
- The key idea is that firm's premiums are tied to the number of worker accidents
- Firms in dangerous industries will pay higher premiums, firms with worse conditions within an industry will pay higher premiums
- The hope is that linking firm's premiums to the number of worker accidents will incentivize firms to improve safety standards
- Let's see what actually happens

Workers' Compensation

Elasticities of injuries and deaths with respect to workers' compensation benefits

Establishment size	Restricted		Annual days	
	Nonlost-workday injury cases	workday injury cases	away from work injury cases	Annual fatality cases
1-99 workers	0.21	0.17	0.62	-1.26
100-249 workers	0.35	0.07	0.55	-1.3
250-499 workers	0.29	-0.1	0.53	-0.69
500+ workers	0.09	0.48	0.31	-1.33

From Table 10 in Workers' Compensation and the Distribution of Occupational Injuries, Ruser, Journal of Human Resources, 28 (3), 1993

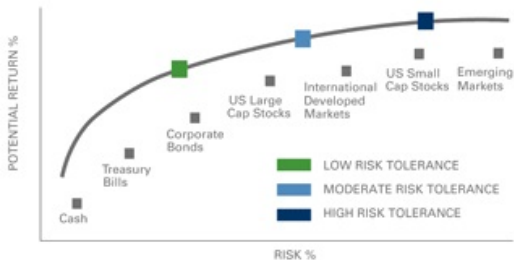
Workers' Compensation

- Empirically, there is a negative correlation between workers' comp and fatalities
- However, researchers find a positive correlation between workers' comp and nonfatal accidents
- What's going on? Maybe reporting, maybe moral hazard
- If it's moral hazard, that generates some new efficiency issues

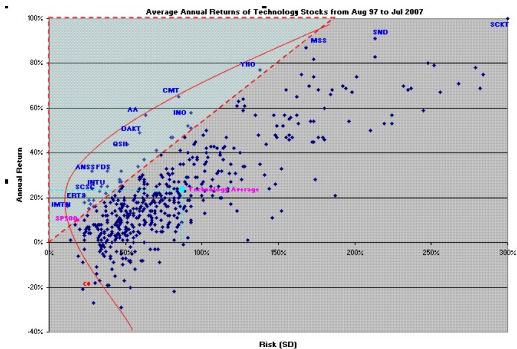
Moral Hazard and Efficiency

- This notion of moral hazard leading to inefficiency gives us a chance to think about financial regulation
- One of the main issues people have worried about recently is the possibility of financial institutions taking excessive risk
- Consider the concerns over the notion of 'too big to fail'

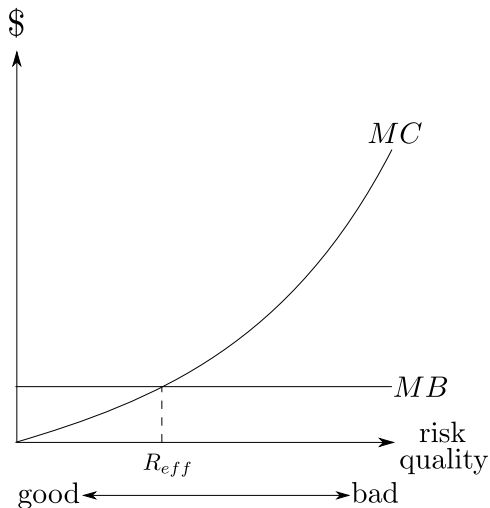
Moral Hazard and Efficiency



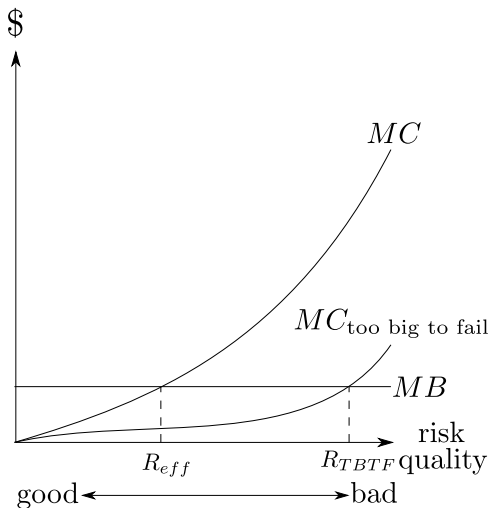
Moral Hazard and Efficiency



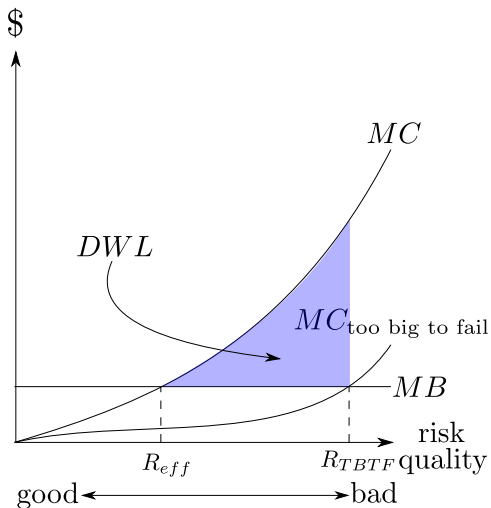
Moral Hazard and Efficiency



Moral Hazard and Efficiency



Moral Hazard and Efficiency



Moral Hazard and Efficiency

- So if a firm thinks it will be deemed too big to fail, it will take on inefficiently risky assets
- This is a standard moral hazard problem that arises when agents are insulated from risk
- It's not the only efficiency issue with too big to fail
- First, there are social benefits from financial sector stability (think of our externality discussions)
- Also there may be economies of scale (think of our natural monopoly discussions)
- But there are also other social costs (more highly correlated risk in the system)