23<u>th</u> Section   Moral Hazard and Principal-Agent Problem

I.   Moral Hazard

The unobservable bad behavior of one party affecting the payoff of another party

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<u>Example</u>

Loss to the Neo if a fire occurs = 40,000

Probability of fire with a fire alarm = 0.001

Probability of fire without a fire alarm = 0.01

This gives

Expected loss from fire if Neo installs a fire alarm = 40,000 * 0.001 = 40

Expected loss from fire if Neo does not install a fire alarm = 40,000 * 0.01 = 400

Insurance company is risk neutral. So

Insurance Premium if Neo installs the fire alarm = E[loss|alarm] = 40

Insurance Premium if Neo does not install the fire alarm = E[loss|no alarm] = 400

Finally an alarm costs 10. You can think of this as a monthly maintenance cost that Neo can shirk on after he purchased insurance. The insurance company cannot observe whether Neo has the alarm installed or not.

Suppose Neo start off with 400 dollars of wealth, we then have the following game matrix, then

Expected wealth if Neo installs a fire alarm and purchase insurance with $40 premium

= wealth – premium – alarm cost

= 400 – 40 – 10   =350

Do the same for all situations we get

		Neo	
		Installs Alarm	No Alarm
Insurance	Premium = 40	0,350	-360,360
Company	Premium = 400	360,-10	0,0

When there is no alarm installed the insurance company would only offer Neo the high premium; from the matrix we see that Neo has an incentive to install the alarm so to get the lower premium. If the insurance company offers Neo the low premium, however, Neo has an incentive to have no alarm, since $360 > 350$. This is moral Hazard.

II. Principal-Agent Problem

The unobservable bad behavior of employee affecting the payoff of owner.

Principal-agent problem usually refers specifically to the case when the *effort* of the employee is unobservable; knowing this, the employee has an incentive to shirk. Thus, it is hard for the owner to come up with accurate compensation for the employee.

Example

Effort: Hours of Working   -   Arrive late and leave early

Effort put into a project   -   Lay-back

Full utilization of production capacity   -   Underestimate capacity

Maximizing company profit   -   Not maximizing profit

III. Solution to Moral Hazard and Principal-Agent Problem

The solution is always better *monitoring* or *commitment*.

Monitoring: Fire alarm wired to the insurance company

Time cards

Owner and employee are closely related—if they are the same people, no moral hazard of principal-agent problem arises

Commitment: Profit-sharing with employee