MORAL HAZARD
BRIEF SUMMARY

Principal: does not observe agent's action
or action non verifiable - non contractible
Agent: chooses action.

Incentive problem:

Principal offers a contract contingent on what is observable but not on the action chosen by the agent.

Choose contract taking into account the agent chooses freely his action: design a system of payments such that the agent prefers to choose the best action from the perspective of the principal rather than any other action.

Example: Regulation

Principal: Regulator

Agent: Innovator sinks unobservable effort e yielding
an innovation with probability $\pi(e)$. $\pi' > 0$ $\pi'' < 0$
Success / failure observable. Effort is costly $\psi(e)$: $\psi' > 0$ $\psi'' > 0$
Social value of innovation common knowledge: S.

Contract: only success / failure is observable. Write a contract with transfers t^S, t^F (contingent on success and failure)
Assumption (for this example): No payment in case of failure.

The regulator chooses the contract so that he maximizes welfare $\pi(e)\left[S-(1+d)t^S\right]+\pi(e)S-\psi(e)$ provided that the firm participates $\pi(e)t^S-\psi(e)\geq 0$ (individual rationality) and such that if a given e' is the best choice from the perspective of the regulator, then it is also the best choice from the perspective of the firm

$\pi'(e')t^S-\psi'(e')=0$ (moral hazard constraint) $\leftarrow$ IMPORTANT

Overall, the optimal effort must satisfy $\pi'(e)t^S-\psi'(e)=0$, that is, the transfer must be such that $t^S=\dfrac{\psi'(e)}{\pi'(e)}$

The problem of the regulator boils down to:

$$\max_e \quad \pi(e)S-(1+d)\psi(e)-d\left[\pi(e)\times\frac{\psi'(e)}{\pi'(e)}-\psi(e)\right] \qquad (\mathcal{P})$$

s.t.

$$\pi(e)\frac{\psi'(e)}{\pi'(e)}-\psi(e)\geq 0 \qquad (IR)$$

Note that under complete information, only IR is relevant. The regulator gives the smallest possible transfer (rents are costly b/c of d): $t^S=\dfrac{\psi(e)}{\pi(e)}$ and utility of the agent is 0. The problem is then

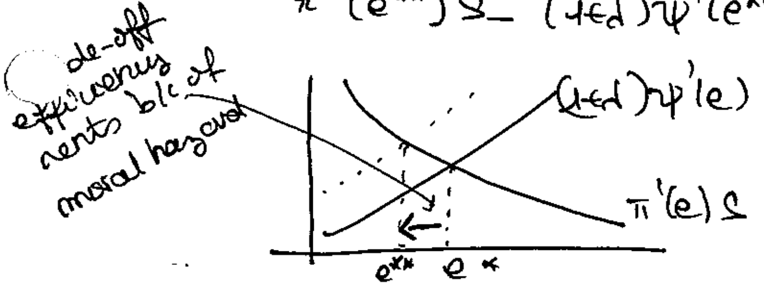
$$\max_e \quad \pi(e)\left[S-(1+d)\frac{\psi(e)}{\pi(e)}\right] \qquad (\mathcal{P}')$$

Solution:

$\rightarrow$ of $(\mathcal{P}')$ $\qquad \pi'(e^*)S-(1+d)\psi'(e^*)=0$

$\rightarrow$ of $(\mathcal{P})$ and neglecting the constraint:

$$\pi'(e^{**})S-(1+d)\psi'(e^{**})-d\,\pi(e^{**})\frac{\psi''(e^{**})\pi'(e^{**})-\psi'(e^{**})\pi''(e^{**})}{\left[\pi'(e^{**})\right]^2}=$$



NOTE: under reasonable assumptions, e^{**} such that (IR) is satisfied