

EC 151 Homework IX
Solutions
Insurance Markets
Turn-in at final

1) Informational problems & Limited Insurance

The two key equations are:

(1) The viability constraint:

$$px + (1-p)y = pH + (1-p)L$$

This means that the avg. expected income from the insurance ^(LHS) scheme must equal the average expected income (RHS) in order for people to participate.

How did we get the LHS? Our insurance scheme stipulates that a person with H give $(1-p)(H-L)$ and a person with L receive $p(H-L)$. So on average a person will receive

$$p[H - (1-p)(H-L)] + (1-p)[L + p(H-L)]$$

$$\Rightarrow pH - p(1-p)(H-L) + (1-p)L + p(1-p)(H-L)$$

$$\Rightarrow pH + (1-p)L$$

(2) The enforcement constraint:

$$pu(x) + (1-p)u(y) - C \geq qu(x) + (1-q)u(y)$$

This means that it is worthwhile for a person to put in effort.

$$= pu(x) + (1-p)u(y) - qu(x) - (1-q)u(y) \geq C$$

$$= (p-q)[u(x) - u(y)] \geq C$$

The best insurance scheme would be one which would give people the same consumption in all states—it would give them their average expected income $X=Y=pH+(1-p)L$ all the time. However, since full insurance often reduces incentives for people to put in full effort i.e. it suffers from moral hazard problems, a second-best insurance scheme is in place. This means that there will be some fluctuation in incomes in both states.

2) Insurance & Incentives

- a. Without insurance, individual farmers are subject to the individual risk of each project. If they have a menu of options with different risk-return profiles, they will choose a low-risk option, which will usually be low-return as well. In contrast, the availability of insurance reduces the risk to each individual farmer, allowing them to obtain the average return. Hence, they are likely to end up choosing a riskier alternative with higher average return.
- b. If insurance works by redistributing income after each realization of shocks, then individuals only get a fraction of the increased expected return of adopting a new technique. Thus, their incentive to innovate is lower than if they chose the technique collectively.