

**Suggested Solutions to Homework # 8**

**Asymmetric information problem in the rural credit market.**

- a. Re-derive all calculations on ex-post and ex-ante moral hazard slides. Make sure that you understand why they are written that way.**

See slides.

- b. Find the minimum collateral necessary to align the incentive of the borrower with the lender. (Hint: Compare the payoffs from choosing each project with and without collateral and see the minimum collateral that requires for tilting the borrower's decision to the favorable way. Repeat for the case of cheating/honest.)**

With collateral, the borrower's expected payoff in risky project is

$$\frac{1}{2}(230 - 110) + \frac{1}{2}(-c)$$

where  $c$  is collateral. His payoff in risk-free project is 10. So

$$\frac{1}{2}(230 - 110) + \frac{1}{2}(-c) \leq 10$$

$$100 \leq c.$$

For the case of ex-post moral hazard, we compare the payoff for cheating and honest payoff:

$$0.4 \times (100 - c) + 0.6 \times (-c) \leq 10$$

$$30 \leq c$$