Development Economics
Key questions (3)

Read Ray (1998) pp529-561 and answer the following questions regarding rural financial institutions.

1. Explain the meanings of *involuntary default* and *voluntary (strategic) default* (about 3-5 lines).

2. Consider two projects a poor farmer can undertake. The poor farmer is risk-neutral (for simplicity). Both projects need an initial investment of $2500. Project A produces revenues of $4000 with probability 0.5 and $3000 with probability 0.5. Project B produces revenues of $5000 with probability 0.5 and $0 with probability of 0.5. Suppose that a moneylender lends money to the poor farmer with interest rate 10% per annum by borrowing money from a government bank with interest rate 5% per annum. (The government bank offers a loan to the moneylender because the moneylender provides some form of collateral to the government bank.) Assume that the poor farmer is forced to repay the loan as long as he has enough resources to do so (no strategic default). However, if he does not have enough resources to repay the loan, his liability to repay the loan will be exempted. The poor farmer is poor with no assets at all, and the moneylender has nothing to do about it. Assume that a legal system to honor credit transactions is absent or weak in the rural area where the poor farmer and moneylender reside, implying that the farmer will receive no serious penalty in the future even if the farmer defaults on a loan.
   i) Calculate the expected profit for the poor farmer under each project (Project A and Project B).
   ii) Calculate the expected profit for the moneylender under each project (Project A and Project B).
   iii) Calculate the expected profit for the rural society where the poor farmer and moneylender reside under each project (Project A and Project B). Determine which project is profitable for the society as a whole in terms of the expected profit.
   iv) Suppose that the moneylender does not monitor what the poor

farmer will do with the borrowed money. Then, which project will the poor farmer choose? Is this socially optimal?

3. A legal system to honor and monitor credit transactions may be absent or weak in rural areas of a developing country. For example, information on farmers with default histories would not be readily available to potential lenders. And once poor farmers default on loans, their liability to repay the loans would be hampered by their poorness. In other words, poor farmers have no resources to repay the loans if the loans are used unproductively. In this context, poor farmers may be more likely to involve in risky projects than the social optimal. Explain the logic here. This question is in essence the same as question 2 above. Here I want you to explain the same answer using words. (about 8-10 lines)

4. What is an advantage of informal lenders (village moneylenders, landlords, traders, and shopkeepers) over formal lender (government or commercial banks, credit bureaus) in providing loans to small farmers in rural areas? Make any one convincing argument (about 4-6 lines).

5. Consider a farmer and a moneylender in a rural area in a developing country. A farmer has two choices. The first choice of the farmer is to work as a laborer on someone else's farm land with remuneration A (constant). The second choice is to borrow some money L (variable) from the moneylender to purchase seeds, fertilizer, and pesticide to work on his own land. The farmer can choose how much money to borrow L. Suppose that the profit function before repaying the loan can be expressed as $\mathrm{f}(L)$ where $\mathrm{f}'(L) > 0$ and $\mathrm{f}''(L) < 0$ (The profit function is increasing and concave in L.) Ethically speaking, the farmer needs to repay the loan, so his final profit will be $\mathrm{f}(L) - L \times (1+i)$ where i is the interest rate charged on the loan. Assume away involuntary default for this problem.
   i) Given a fixed i, how much money does the rational farmer borrow if he decides to work on his own farmland. Show the optimality condition.

   Now suppose the moneylender is a monopoly, so he can choose an interest rate at his discretion. However, remember that the farmer has the alternative option: work as a laborer on someone else's farm land. The moneylender, of course, wants to maximize his profit from this money transaction, meaning that he wants to make the interest rate as high as possible.

ii) Given a fixed L, what is the condition for i to make sure that the farmer will choose to farm on his own land rather than to be employed by someone else? In other words, what is the participation constraint?

Now we will shift our time horizon. So far, we have assumed that the money transaction between the farmer and the moneylender is just one time. From now on, we assume that the money transactions will continue forever in the future. The moneylender is willing to offer a loan to the farmer as long as the farmer repays the loan in the past. However, once the farmer fails to repay the loan, the moneylender never offers the loan to the farmer in the future. Suppose the discount factor for the farmer is given by $0 < \delta < 1$.

iii) Show the condition that induces the farmer to repay the loan rather than default. Is the new condition you have just found more difficult to hold in comparison with the participation constraint above? Mathematically justify your answer.