Economic Development Final, 2001

Your examination contains two questions. Answer every part in each question. Total time is 2 hours. A good allocation is 1 hour and 10 minutes to [1] and 50 minutes to [2]. Try to keep your answers brief and to the point.

Total Points: 24 + 15 + 6 (extra credit).

[1] (24 points, 6 points each) In the following questions, please stick to the point and don’t put in extraneous information. If you try to go on in excessive detail, you will run out of time.

1. In the two-occupation model of persistent inequality studied in class, prove that a steady state with a larger percentage of skilled labor must exhibit higher output (net of training costs).

2. Describe carefully a model of joint effort provision in which greater inequality makes for a higher degree of (additive) social surplus.

3. In the credit model with limited enforcement, prove that an increase in the outside option \( v \) for a borrower must lower his equilibrium payoff, assuming that the first-best loan is not enforceable. Explain this paradox.

4. In the Stiglitz-Weiss model of credit rationing with adverse selection, prove that if there is credit rationing in equilibrium, then credit rationing must continue if everyone’s collateral is uniformly lowered.

[2] (15 points) A rice trader lends working capital to a rice farmer. If \( L \) denotes the amount of capital (all taken as a loan), then the farmer can produce an output \( 2\sqrt{L} \). The opportunity rate of interest of funds to the trader is given by some parameter \( r > 0 \). Both parties are risk neutral and seek to maximize monetary returns.

(a) (3 points) Describe the first-best quantity of the loan, and use this to obtain a formula for the total potential surplus in the relationship. Show that this latter value equals \( 1/(1+r) \).

Now suppose that the trader’s only instrument is the rate of interest \( i \) he charges on the loan to the farmer. [In particular, the trader can’t control the loan size; the borrower does.]

(b) (3 points) Prove that if the trader makes positive profit on the loan transaction, then the sum of the trader’s payoff and the farmer’s payoff must be strictly less than the first-best surplus. Use this analysis to examine the general assertion made in class that borrower-friendly equilibria are more amenable to efficiency.

Now give the rice trader another instrument. Suppose that he can also buy rice from the farmer at a price \( p \) (he sells the rice on the open market at a fixed price, say unity). [The trader still can’t control the loan size.]

(c) (3 points) Prove that in all equilibria in which the trader makes a positive profit on the combined transaction, he will offer to buy the farmer’s rice at a price less than one, and offer
him loans at below-cost rates of interest! That is, prove that $p < 1$ and $i < r$. In the process, show now that the equilibrium is fully efficient.

(d) **(3 points)** Use parts (b) and (c) to argue why you would expect to see a rice farmer taking loans from a rice trader, rather than from an individual whose only activity is moneylending. [Assume that both lenders have the same opportunity cost of funds.]

(e) **(3 points)** Use these insights to argue why a landowner who provides working capital to his tenant might lease out his land on a sharecropping contract rather than fixed-renat tenancy.