Department of Economics
Queen's University

ECON239: Development Economics
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Assignment #3
Due Date: 4.00pm, Friday November 19, 2010

Section A (40 percent)**:** Briefly discuss the validity of each of the following statements. In your answer define or explain as precisely as possible any terms or concepts which are underlined, with particular reference to the context in which they are being used. The text for each answer should be no longer than a page, but you also should also include diagrams or examples where appropriate. They have equal value.

A1. Privatization of land rights is an appropriate response to the so–called "tragedy of the commons" problem.

Under a fairly strong set of assumptions, one can make the argument that the assignment of private property rights over land should alleviate excessive land use, which may reduce soil degredation and excessive clear–cutting. In regions where population levels are high, a so–called "Tragedy of the Commons" situation may arise in the absence of well–defined property rights. To see this, assume that farmers have some low opportunity cost, w, of farming (e.g. they could work for some other employer). Suppose that each farmer can use 1 unit of land. Because of soil erosion and population density, as more farmers enter the region and use the land, average output declines (e.g. nutrients in the soil disappear). This is illustrated in the Figure 1. With no private property rights, the farmers will use the land up to point where $AP = MC(= w)$. In contrast, if the land is privatized in the hands of a single landowner who employs the farmers, she will take into account the effects of land use on average product (thereby internalizing the externality). She will hire labour to work on the land only up to the point where $MP = MC$, where her rents (the shaded area) are maximized. This is efficient because, the remaining workers are presumed to also receive w in their next best alternative, so that no party is worse off.

This argument, however, assumes away imperfections in land, labour and credit markets, and ignores potential problems of implementation. If property rights were conferred to a single landowner, the assumption that the now landless farmers have other opportunities for work may not be met, if there is unemployment. If property rights are conferred to each individual farmer, it may not be the case that subsequent land trade leads to an efficient allocation of land, if credit markets are imperfect (due to distress sales). In terms of implementation, experience has shown that land titling programs are costly and politically uncertain and, especially where population pressure is not that great, informal, communal tenure systems may work fairly well in ensuring

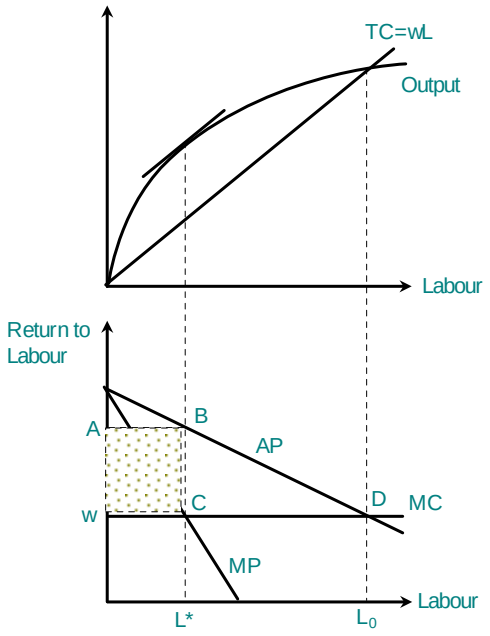

Figure 1: Tragedy of the Commons

optimal land use. Moreover, long term leasing of state–owned property may achieve many of the benefits of tenure security, without the need for private ownership. Finally, for political reasons (i.e. where large landowners have strong political power) it may be easier for governments to provide formal title to poor farmers on marginal lands (i.e. frontier settlement). This may have adverse environmental consequences, as was the case in Northeastern Brazil, where poorer farmers were given incentives to clear cut parts of the rainforest in return for formal titles.

A2. <u>Redistributive land reforms</u> are unnecessary because land markets should ensure an <u>efficient</u> <u>allocation of land</u>.

Redistributive land reform refers to policies that attempts to re-allocate land usually from large to small land owners, either by expropriation of via some transfer system involving compensation for the owners. An efficient allocation of land would be one in which no owner could be made better off without making another worse off. Empirical evidence from a variety of sources suggests that there is a negative relationship between operational land size and land productivity — that is there are diminishing returns to land in labour–intensive farming. Figure 2 illustrates the implications of this for the distribution of land ownership. If land were to be transferred from the rich to the poor farmer, the gain in output for the poor farmer should exceed the loss for the rich one. If land and capital markets operated perfectly then these gains would be achieved through trade. However, since in many cases they do not (due to imperfect credit markets and weak property rights), redistributive land reform may be the only way to realize them. Since such land reforms require land to be transferred from rich to poor, they depend very much on the willingness of

large landowners to relinquish their land. In principle, it should be possible to compensate them for their loss through the increased production that results. In practise, because of the time reforms take and the uncertainties involved, it is unlikely that large landowners would trust such a process to make them better off. It would require them to give up land today in return for some uncertain payment in the future (unless the government incurs a lot of debt to implement the process, which may not be feasible). As we saw in the case of Columbian land reforms, there is an incentive for large landowners to use any political power that they have to undermine the reform process. Note that this does not imply that weak political power of large landowners is sufficient for successful land reform (e.g. Zimbabwe).

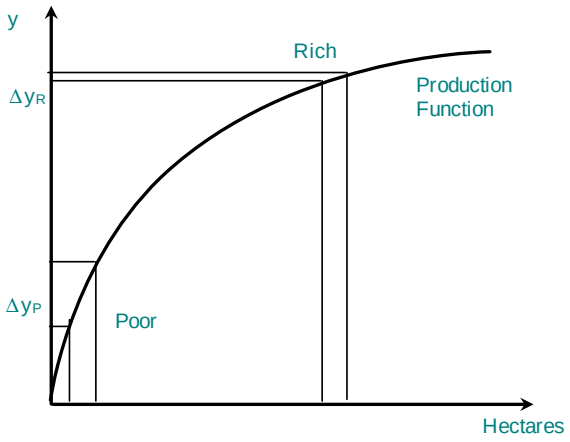

Figure 2: Gains from Trade in Land Markets

A3. Trade–credit interlinkages can be a way of increasing the economic surplus involved in a credit transaction.

Trade–credit interlinkages refer to the fact that many money lenders are also engaged in trade with their borrowers, either supplying inputs (e.g. fertilizer or capital equipment) or buying the outputs (e.g. crops, dairy products). This means that they can implicitly lend "in–kind" by supplying inputs at a low price or can implicitly receive repayment by buying outputs at a discount relative to the market price. There are various reasons why this might occur. One reason is that in some Islamic societies explicit charging of interest is forbidden / shunned, so that this may be a way round the law. Other benefits include the fact that by buying the outputs, repayment with the requisite interest is more easily enforced and, because the lender may therefore know more about the risks and constraints faced by the borrowers, screening costs may be reduced. These last two benefits effectively increase the economic surplus involved in the transaction — the difference between the total value of output and the total costs of lending — by reducing transactions costs.

When informal interest rates are higher than formal rates, so that farmers borrow and produce

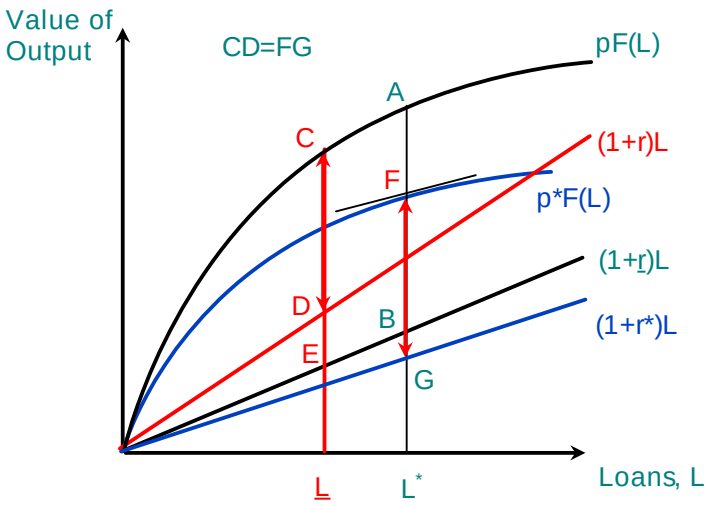

Figure 3: Recreation of Efficient Surplus through Trade–Credit Interlinkage

less than they would if they had access to formal sector loans, trade–credit interlinkages can also provide a way to raise production and re–create an efficient economic surplus. The economic surplus is simply the difference between the total benefits and the total costs accruing to all the parties involved in an economic transaction. The idea of re-creating an efficient economic surplus is illustrated in Figure 3. If the farmer could borrow in the formal market are rate $\underline{r}$ it would maximize the surplus by borrowing L^* and earning the efficient economic surplus AB. However, since he only has access to informal lenders, who borrow from the formal market and lend at the higher rate r, the farmer only produces at $\underline{L}$, earning the return CD. In this case, the lenders make a profit equal to DE. A lender may be able improving on this situation by setting a combination of a low rate of interest, $r^* < \underline{r}$, and a low purchase price, $p^* < p$, to induce efficient production by the borrower. As long as he does this so that the borrower at least $FG = CD$, the borrower will agree to this arrangement. Since the total surplus has increased back to AB, the lender's profit margin, $AF - BG$ must exceed DE.

A4. The expansion of formal sector lending at low interest rates is likely to result in a more equitable distribution of credit in LDCs.

Formal sector lending refers to lending by both private commercial banks and publicly run traditional development banks. Such lending in the rural sector of developing countries is often characterized by "arms–length" lending in which the banks don't have a lot of information about the borrowers. If there were no informational asymmetries and the high interest rates in the informal sector were solely due to the monopoly power of moneylenders, then the provision of low interest loans may be a way of inducing a more equitable distribution of wealth, at least in the short run. In many cases, however, formal sector loans are made at "arms–length", with little or no information about the borrowers. To deal with the adverse selection and moral hazard

problems involved, formal lenders may often ration credit. Those who have collateral are more likely to be able to obtain credit, so that the wealthy and those with titled land have greater access to credit. Moreover, large loans are cheaper to make due to economies of scale (e.g. the same amount of time and paperwork may be needed for small and large loans). Also, if loans are non–excludable and formal sector debt is senior, loans made in the informal sector may become riskier. Lenders may then raise their interest rates, so that those with no access to formal sector credit are even worse off. Finally, political patronage and corruption may direct even well intended credit away from the hands of those who need it most.

Section B (60 percent)**:** Answer the following questions**.** They all have equal value.

B1. Please read the article "The Evolution of the World Bank's Land Policy: Principles, Experience and Future Challenges" by Deininger and Binswanger, and answer the following questions. Answers may be provided in point-form. The article can be downloaded from the Course Outline page of the ECON239 web site.
(a) How has experience with land reforms challenged the World Bank's earlier assumptions as reflected in its 1975 Land Reform Policy Paper"?
(b) What advantages do owner–operated farms have over larger operations ? What factors could outweigh these advantages ? Explain.
(c) Summarize the main problems that lead land markets to perform imperfectly. Why are "distress sales" likely to lead to inefficient land allocation ? Why might rental markets be more efficient in some cases ?
(d) Why does the World Bank support redistributive land reform ? What factors are responsible for their common lack of success ?
(e) How has the World Bank's thinking changed with respect to communal tenure systems ? Explain why.

B2. Consider a development bank that is lending to rural borrowers and wants to just break–even. All borrowers require a loan of $100 and the gross cost to the bank of making such a loan is $160. There are two types of borrower: type 1 and type 2. A type 1 borrower can get a gross return of $200 with certainty. A type 2 borrower can obtain a gross return of $360 with probability 0.75 and 0 otherwise. The opportunity costs for type 1 and type 2 borrowers are, respectively, $18 and $20. However, when extending the loan, the bank does not know the types of each borrower and only knows that 50% are of type 1 and 50% are of type 2. Assume to begin with that the bank lends to each borrower on an individual basis.
(a) Compute the gross repayment required by the bank from each borrow in order to just break even on average, assuming both types borrow. What is the implied

interest rate on loans? Explain what happens if the bank is unable to implement some kind of group lending mechanism.

If both types borrow, the break even gross repayment level in this case must satisfy

$$\begin{aligned}[0.5 + 0.5 \times 0.75]\, R_b &= 160 \\ R_b &= 182.86\end{aligned}$$

(a) Under these terms would both types of borrower actual want to borrow? What is the implied break-even interest rate given this result.

The return to a type 1 borrower under this case is $200 - 182.86 - 18 = -0.43$. Thus type 1 borrowers would not apply for loans at this rate. Type 2 borrowers would because their expected return is $0.75(360 - 182.86) - 20 = 112.86$. Realizing this, the bank would raise its break-even repayment so that

$$\begin{aligned}0.75R_b &= 160 \\ R_b &= 213.33.\end{aligned}$$

Thus we have a situation of adverse selection and type 1 borrowers would be shut out of the market. The interest rate in this case is 113.33%.

Now suppose the bank can lend to groups consisting of two borrowers each. Assume that the bank is able to impose a joint responsibility default clause: A borrower will have to pay for her partner when her partner fails or else both borrowers will be excluded from future financing. Assume also that the borrowers know each others' types and engage in positive assortative matching when forming their groups.

(c) Assuming that successful type 2 borrowers can always repay the debt of unsuccessful ones, what are the possible outcomes of a lending contract with a risky pair? What is the probability of each outcome

Outcome	Both succeed	Neither Succeed	One succeeds, one fails
Probability	$0.75^2 = 0.5625$	$0.25^2 = 0.0625$	$2 \times (0.75)(0.25) = 0.375$

(d) Compute the break–even interest rate in this case.

Assume assortative matching: with probability 0.5 both members are type 1 and. with probability 0.5 both members are type 2. Then, assuming that successful type 2 borrowers can repay the debt of unsuccessful ones (an assumption that must be verified), the break-even repayment must satisfy

$$\begin{aligned}[0.5 + 0.5((0.75)(0.75) + 2(0.75)(0.25))]\, R_b &= 160 \\ [0.5 + 0.5(0.9375)]\, R_b &= 160 \\ R_b &= 165.16\end{aligned}$$

(e) Verify that the assumption made in part (c) is valid. Will both types of borrower want to borrower under these terms? Explain.

Note that since $360 > 2 \times 165.16 = 330.32$ the repayments assumed above are feasible.
The net return to the type 1 borrower group in this case is $400 - 330.32 - 36 = 33.68$
The expected net return of the type 2 borrower group is

$$(0.75)^2 [720 - 330.32] + 2(0.75)(0.25) [360 - 330.32] - 40 = 219.2 + 11.13 - 40 = 190.33.$$

It follows that both types of borrower group would be willing to borrow and the interest rate charged by the bank would be 65.16%.