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Credit markets

Agency problems

- A loan agreement involve a borrower and a lender. The borrwer has a project but no money, and the lender has the money to lend.
- Agency problem: lender is unable to observe borrowers' characteristics (ex. Riskiness), or effort, or profits.
- This is a problem of information on the borrower. This is a key aspect of credit markets. In developing countries, this is precisely what microfinance may help to solve.

Problem can arise at 3 stages: 3 types of agency problems

- Prior to granting a loan: lender does not know the « quality » of the borrower (for example: is she a risk taking person?)
- Once the loan has been granted: lender does not know entierely how borrower will use the money (for example, can't observe if borrower works hard to make the project succeed)
- Once investment returns are realized: lender may not be able to verify their magnitude. So some borrowers may claim that they were unlucky and the project failed, in order to avoid pauing back, even if in fact they made money and could afford paying.

Absence of formal credit institutions in village economies

- This is often due to these kinds of agency problems.
- The problems are even accentuated when people cannot offer collateral, and when legal enforcement mechanisms are weak.

Limited liability

- If borrowers have limited liability, this means they cannot repay more than their current income. In particular, when borrowers do not have collateral, the only money that can be used to pay the lender is the profits from the project. In the event of failure, the lender does not get anything in the absence of collateral
- In the following analysis, we assume that borrwers have limited liability

Agency pb 1: Adverse selection

- This problem arises before the contractual arrangement take place.
- Problem: lender (bank) lacks good information about the riskiness of borrowers projects (i.e, about how likely to fail projects are)
- Assume there are two types of potential borrowers:
- Safe: her project makes profits with certainty
- Risky: project makes more money if successful but only makes money with some probability p.
- Assume competitive lenders: their profits are driven down to zero by competition, and they charge just enough to break even, i.e cover the cost of lending (which includes transaction costs, so higher than just the amount of the loan)

- Furthermore, assume that investment by either type of borrowers makes enough money, in expected terms, to cover the cost of capital. This means that all borrowers should have access to loans, if the market worked well, since all their projects are worthwhile (i.e expected returns are higher than cost of funds)
- First, assume there are only safe borrowers in the population. Then, the bank knows that if it lends, the project makes money for sure. Then, the gross repayment R (principal + interest) is set just equal to the cost of capital.
- Since safe borrowers always succeed, they can always repay and the bank is sure to recover its cost. The bank's profit is zero (just breaks even) and the borrower keeps the difference between her project's earnings and the amount R repaid.

- Now, assume there are also risky borrowers, and the bank cannot tell who is who. The bank only knows that there is a proportion q of safe type, and (1-q) of risky types in the population.
- Then, to compensate for risk, in order to just break even, the bank needs to charge an interest rate higher than just the cost of capital.
- All borrowers pay this high interest rate, since the bank cannot tell who is who and thus can't charge depending on type.
- **The interest rate necessary is increasing in the riskiness of the borrowers (how likely they are to fail i.e the probability (1-p)), and in the proportion of risky people (1-q).**
- **Hence, the safe borrowers (whi ideally should pay a lower rate) pay for the risky ones' riskiness!**

- So here is the problem then: it risky people are very risky (low p) or if there are lots of risky people (low q), the bank needs to charge a very high interest rate to compensate for risk.
- Because borrowers keep the difference between their earnings and the interest rate, at some point, the rate may become to high for safe borrowers to think it's worth asking for a loan (if the interest rate exceeds their profits, they make a loss!)
- And the more risky the risky people are, and the more risky people there are, the more likely it is that safe borrowers are discouraged.
- **The presence of risky borrowers raises the interest rate, and it may get so high that safe borrowers leave the market!**
- **But this is inefficient, since we assumed that all projects are worthwhile, so they should all exist if things were to work well.**

- So at that point, beyond a certain level of the interest rate necessary for the bank to break even, the bank only has risky borrowers.
- Now assume these risky people are even more risky. Well then the interest rate needs to rise to compensate, so the bank's expected profit from repayment is still enough to cover the cost of capital.
- And well, beyond a certain point, the interest rate may be so high that even risky borrowers stop asking for loans! And the credit market completely collapses!
- The main lesson we get from all this is the following: When the bank lacks information about borrowers, the market may cease to be efficient.
- NB: the lack of efficiency here arises because we start with the assumption that all projects are worthwhile and thus should exist. And because as the interest rate rises, borrowers exit the market, all projects do not exist, which is inefficient for the society.

Agency problem 2: Ex ante moral hazard

- Situation where unobservable actions (or effort) are taken by borrowers after the loan has been disbursed, but before the project's returns are realized.
- And these actions (effort) affect the probability of success of the project.
- Assume that once a particular borrower has obtained a loan, she can either:
- Make effort and earn profits y with certainty
- Or not work hard and make profit y only with probability $p < 1$ (i.e when she does not work hard, she succeeds only if she's lucky.)
- But making effort is costly for the borrower: c (think of non monetary cost, like disutility, or the opportunity cost of another work activity)
- Gross repayment (principal plus interest) R must be sufficient to cover the cost of capital k for the lender.

- Suppose that if the borrower makes effort, the net return of the project for society is greater than the cost of capital:

  $y - c > k$

- This means that in an ideal world, she should be given a loan and she would work hard on the project.
- Problem: the borrower may not find it worth it to make effort, given R, and the lender does not have any way to force the borrower to work hard.
- The borrower, if she makes effort, gets $y - c - R$
- If she doesn't: she gets expected profit $p(y - R)$ (that is, zero with probability $(1-p)$)
- Thus, she works hard only if $y - c - R > p(y - R)$
- Rearranging, this means that borrowers works hard only if R is less than $y - [c/(1-p)]$.

- So R should be low enough that borrower thinks it's worth it to work hard (and bear the cost c of doing so)
- But recall that at the same time, lender must set R high enough so that R covers the cost of capital k.
- But what if $y - [c/(1-p)] < k$? Then, the lender, who must charge at least R = k (to cover costs), cannot set R so that the borrower works hard!
- In this situation, the bank knows that if it sets R high enough to cover its costs, then the borrower won't work hard and the project might fail...
- Anticipating this, the bank decides not to grant the loan, since it knows for sure that the borrower will not work hard! And this is inefficient for society, since we assumed the project is worthwhile if the borrower works hard.
- Collateral could help the borrower commit to work hard: the collateral would need to be big enough for the borrower to want to work hard in order to avoid losing it in case of failure. But typically, the poor do not have collateral...

Agency Problem 3: Ex post moral hazard

- Also called the « enforcement problem »
- The borrower may decide to « take the money and run »

This may happen:

- When the lender cannot verify how much money has ben made with the project, the borrower might claim a loss to avoid repayment.

-Or when legal enforcement of repayment is not possible even if the lender knows the borrower can afford to repay.

- If the repayment R required is very high, the borrower may indeed think it's worth not repaying. (and even is she has put up collateral, it could be worth losing the collateral anyway)
- And again, remember that lender must set R high enough to cover its costs: so this could clash with the incentives of the borrower

- Then, if there is no level of repayment would both cover the lender's cost, and induce the borrower not to cheat, there is no point for a lender in making any loan
- The only way would be if the lender could put forward a credible threat: like « i will never lend you money ever again if you don't repay »
- But in contexts where borrowers could easily migrate and change identity, the threat would not be credible.

Group lending

- Group lending refers to arrangements by individuals without collateral who get together and form groups with the aim of obtaining loans from a lender.
- Loans are made to individual group members, but all the group face consequences if any member runs into repayment difficulties.
- This « group responsability » is often called « joint liability »
- Microfinance organizations, such as the Bangladeshi NGOs Grameen Bank and BRAC, use the group lending methodology, coupled with regular (usually weekly) group meetings (at the village) with the borrowers.
- Repayment is required in small weekly installments.
- At the weekly group meetings, weekly repayments are collected, and any problems can be discussed and resolved.

- The method used by microfinance organizations is convenient for borrowers, since the bank comes to them, in their village, to deal with loan arrangements and repayments.
- But the method also greatly reduces transaction costs for microfinance lenders.
- Group meetings allow the loan officers to collect repayment and see a high number of borrowers relatively quickly
- **Moreover, group lending, as we'll see below, can mitigate the agency problems we discussed.**
- Basically, the contracts take advantage of the fact that group members themselves know each other, and the contract gives members the incentive to use this knowledge to the bank's advantage.
- Thus, group lending can mitigate agency problems without the necessity for the bank to learn anything new about borrowers!

Mitigating adverse selection

- We use the framework described previously for adverse selction.
- As before, consider competitive lenders: each lender makes zero profit, charges just enough to cover its costs.
- Adverse selection: there are both safe and risky potential borrowers, and the bank cannot tell who's who. As before, the problem is that the bank would like to charge a lower interest rate to safe people, but it can't tell who's who, si it must charge everybody the same rate.
- Because of risky borrowers, the interest rate is higher than if there were only safe ones
- As explained above, the inefficiency arises when the safe ones are discouraged to ask for loans, because the interest rate is too high.

- But now, the lender uses the group lending method.
- While the bank does not know who is who, borrowers do.
- The key to the solution: groups are encouraged to form on their own. So potential borrowers use what they know about their fellow villagers to find the best partners.
- Because the contract involves group responsability, it is clearly better to be grouped with safe types (since they never fail)
- So given the choice: safe types group with safe types. And the risky ones have no alternative but to form groups with other risky types.
- Indeed, if one in the group fails, the others in the group must repay for her. (that's group's responsability) Otherwise, they will be denied future access to loans.

- Since risky people's projects fail more often, risky borrowers have to repay for their defaulting peers more often under group responsibility
- This means that although both types of borrowers are still charged the same interest rate (because the bank cannot tell who's who), **safe borrowers pay in fact less, simply because they do not have to pay for their group members' default** (since safe types never default)
- Moreover, since **the bank is better insured against default** (because if one defaults in a risky group, the others repay): failure to repay by a risky type now only happens if all members of her group have failed as well.
- Because of this better insurance for the bank, **it can charge a lower interest rate. This encourages safe borrowers to stay in the market.**

Overcoming ex ante moral hazard

- Recall the problem faced by the bank: it may not be able to charge interest high enough to cover its costs and at the same time low enough to make it worthwhile for the borrower to work hard.
- With group lending, since group members often live and work closely together, they can impose social or economic sanctions on a member who is caught no working hard. (the bank cannot catch a lazy worker, but they can)
- And they do so because if one is lazy and fails, the other have to repay for her, otherwise they will all be denied future loans.
- Because of this cost (enforced by your fellow group members) in the event that you are lazy, you have an additional incentive to work hard.
- This makes it easier for the bank to charge an interest rate high enough so that costs are covered, while still inducing hard work.

Overcoming ex post moral hazard

- Recall the problem: borrowers may be tempted to « take the money and run », even if they succeeded and can afford to repay.
- The problem is that the bank cannot tell who truthflly cannot repay and who is in fact cheating (i.e. just pretendint they cannot)
- **The key aspect of group lending that helps with that is peer monitoring**: if one member says she cannot repay, her fellow group members can spend some time and effort verifying this, since they know each other well.
- If it is established that the member was trying to cheat, the others can sanction her socially or economically.

- And recall that under group responsibility, if one group member does not repay, the others have to repay for her, otherwise they are denied future loans.
- So if one announces she cannot repay, the others have an incentive to check if that's true: they don't want to repay for her if in fact, she could repay herself!
- Thus, group responsability helps to reduce the risk for the bank that one borrower « take the money and run »

So, on paper, group lending works pretty well!

- **But how well does it do it practice?**
- To be fair, it has been a really good solution to the lack of access to credit in poor countries. Programs run by the Grameen Bank in Bangladesh, as well as numerous others worldwide, have provided loans to the poor and helped them improve their conditions.
- But of course, not everything is perfect: some empirical studies support the nice predictions of the theoretical results, while other empirical studies point to tensions and constraints in the group lending approach:
- Some argue that the sanctions on fellow group members are sometimes exceedingly harsh
- Also, since microfinance organizations often have a social motivation, rather than profit, they really want to help, so loan officers may not be as strict as they should in enforcing the rules.

- Other questions include:
  - Has it really helped the poor? Some studies argue that it helped the poor, but not the poorest of the poor
  - Since many programs are targeted toward women, another question is: Has it contributed to promote women empowerment?
- Moreover, even if the approach has been successful in many cases, there are limits on its applicability to different contexts:
  - For example, the social ties among group members necessary to make it work may fail to exist in urban areas, which are more anonymous places.
  - In urban areas, borrowers may lack information about each other.