Lecture 3: Credit Markets and Microfinance

EC2303: Intermediate Development Economics

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Context for this lecture

- Last time, we saw that returns to capital in Sri Lanka are high when cash grants are given to micro-enterprises.
- This raises the question: can credit lift people out of poverty? With such high returns, people should just be able to borrow?
- We'll first show that credit markets can fail when there is asymmetric information. By the end of today's lecture, you should understand adverse selection and moral hazard.
- We'll discuss how microfinance tries to overcome these problems.
- We'll then look at the impacts of microfinance. We'll see that microfinance has some beneficial effects on recipients, but it's not a silver bullet to lift people out of poverty. In particular, incomes don't go up a whole lot on average.
- One reason may be that not everyone is a natural entrepreneur; people may not have the interest or skills to run a business.
  - Note that the de Mel paper showed high returns for people who were already running businesses.
  - In line with this view, incomes do go up for a subset of people when they get access to loans.

A simple model of credit markets

- A risk-neutral borrower has a project that requires one unit of capital and pays return R_i with probability p_i, and nothing otherwise.
  - (So the returns to capital are $R_i p_i$; remember from last lecture: this is high.)
- A risk-neutral lender can lend to the borrower; the lender has opportunity cost of capital γ. (This is what the lender pays to borrow; it's likely pretty small, especially for big lenders.)
- What is socially optimal?
  All projects with $p_i R_i \geq \gamma$ should be implemented.
- Under what conditions does the credit market achieve this, and when does it fail to?

Lending and borrowing in a perfect market

- In a perfect credit market, there is full information, and the lender makes no profit (because there is competition amongst lenders).
- We'll also assume full liability for now, i.e. the borrower must repay the loan no matter what.
- At what rate does the lender lend? Their expected return must be at least the opportunity cost of capital, and because of perfect competition, it's *exactly* the opportunity cost of capital:
  $r = \gamma$
- Which projects get realized?
  Those for which the borrower's expected returns exceed the interest rate the lender charges: $p_i R_i \geq r$, i.e. $p_i R_i \geq \gamma$.
- Remember the socially optimal outcome was precisely this, i.e. projects with $p_i R_i \geq \gamma$ are implemented.

Limited liabilty does not lead to credit market failure

- It's unrealistic to assume full liability: in reality, borrowers will only repay if the project is successful. This is called *limited liability*. Does it lead to a credit market failure?
  No. Let's see why:
- Now the lender gets r if the project is successful (probability: p_i), and 0 otherwise. So their expected return is now rp_i, instead of just r.
- Because there is full information, the lender knows p_i and offers a corresponding, individualized r_i.
- At what rate does the lender lend?
  $p_i r_i = \gamma \Rightarrow r_i = \frac{\gamma}{p_i}$
- Which projects get realized?
  The borrower earns R_i and pays r if the project succeeds (probability: p_i), and earns 0 and pays 0 otherwise. So the borrower takes the loan if $p_i(R_i - r_i) \geq 0$. Substituting r_i from above: $p_i(R_i - \frac{\gamma}{p_i}) \geq 0 \Rightarrow p_i R_i \geq \gamma$.
- Note this is the socially optimal outcome from above. So when borrowers only repay if the project is successful, this by itself is not sufficient to make the market fail!

Adverse selection leads to credit market failure

- Now assume that the lender can't perfectly observe how much risk the borrower takes. This is called *adverse selection*. Does it lead to a credit market failure?
  Yes. Let's see why:
- Assume there are two types of borrowers: a "risky" type, and a "safe" type. The risky type has a higher return R_r, but succeeds with a lower probability p_r. The safe type has a lower return R_s, but succeeds with a higher probability p_s. So we have: $R_r > R_s$ and $p_r < p_s$.
- Further assume the two projects are socially beneficial, so should be undertaken: $R_r > \gamma$, $R_s > \gamma$.
- The lender would like to charge the safe borrower $r_s = \frac{\gamma}{p_s}$, and the risky borrower $r_r = \frac{\gamma}{p_r}$. However, the lender can't distinguish between the two types; it just knows the share of safe borrowers, s. It therefore charges all borrowers the same interest rate $\bar{r}$ such that the expected returns equal the opportunity cost: $s \cdot p_s \bar{r} + (1-s) p_r \bar{r} = \gamma$. Solving for $\bar{r}$: $\bar{r} = \frac{\gamma}{s \cdot p_s + (1-s) p_r}$.

Adverse selection leads to credit market failure

- Because the success probability of the risky type is lower ($p_r < p_s$), $\bar{r}$ lies above r_s and below r_r. This means that the safe type gets charged a higher interest rate than they would be under full information, and the risky type a lower one.
- Importantly, this means that the loan could be worthwhile for the safe borrower under full information, i.e. $p_s(R_s - r_s) \geq 0$, but not with the pooled interest rate, $p_s(R_s - \bar{r}) < 0$. This means that the safe borrower exits the market, while the risky borrower stays.
- Now only the risky projects get realized. This is not socially optimal – remember we said both projects should be undertaken.
- So adverse selection leads to a credit market failure, resulting in high interest rates and high rates of default.

Ex ante moral hazard leads to credit market failure

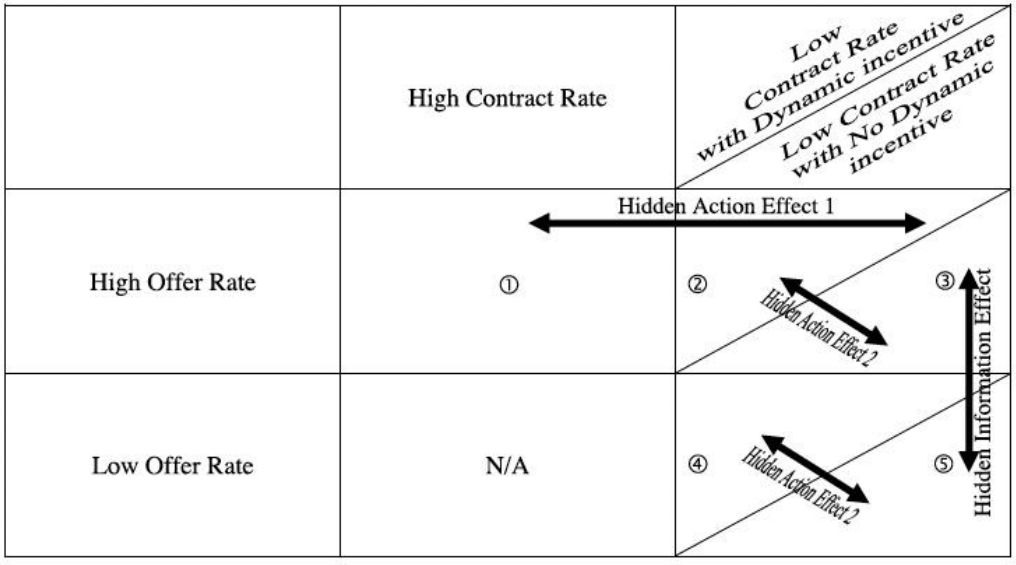
- Now assume that the borrower can choose between a risky and a safe project, and the bank cannot control which project they choose.
- Also assume the safe project is better in expectation, i.e. $p_s R_s > p_r R_r$.
- This means the borrower wants to invest in the safe project.
- Knowing this, the bank offers interest rate $r = \frac{\gamma}{p_s}$.
- But: Now the borrower has an incentive to switch to the risky project!
- Take a borrower for whom it *just* made sense to borrow for the safe project, i.e. they earn zero: $p_s(R_s - \frac{\gamma}{p_s}) = 0$, i.e. $p_s = \frac{\gamma}{R_s}$.
- With the risky project at the low intrest rate, they earn $p_r(R_r - \frac{\gamma}{p_s})$. Substitute $p_s = \frac{\gamma}{R_s}$ from above to get: $p_r(R_r - \frac{\gamma}{\gamma/R_s}) = p_r(R_r - R_s) > 0$.
- This is always positive. Thus, it now makes sense to switch to the risky project. But this is not socially optimal: remember that the safe project is better in expectation.
- So "ex ante" moral hazard also leads to a credit market failure.

Ex post moral hazard leads to credit market failure

- A third problem: "ex post" moral hazard.
- When the project is successful, some borrowers don't want to repay.
- The bank incurs additional costs and delays to enforce repayment, and possibly only gets partial payment.
- This means that the bank has to charge a higher interest rate up-front to *all* borrowers (because it doesn't know who the "bad" ones are). So again, projects don't get realized that otherwise would have, leading to loss of social value. "Good" borrowers are forced out of the market, or have to become "bad", leading to high interest rates and low repayment rates.
- So "ex post" moral hazard also leads to a credit market failure.

How important are these asymmetries?

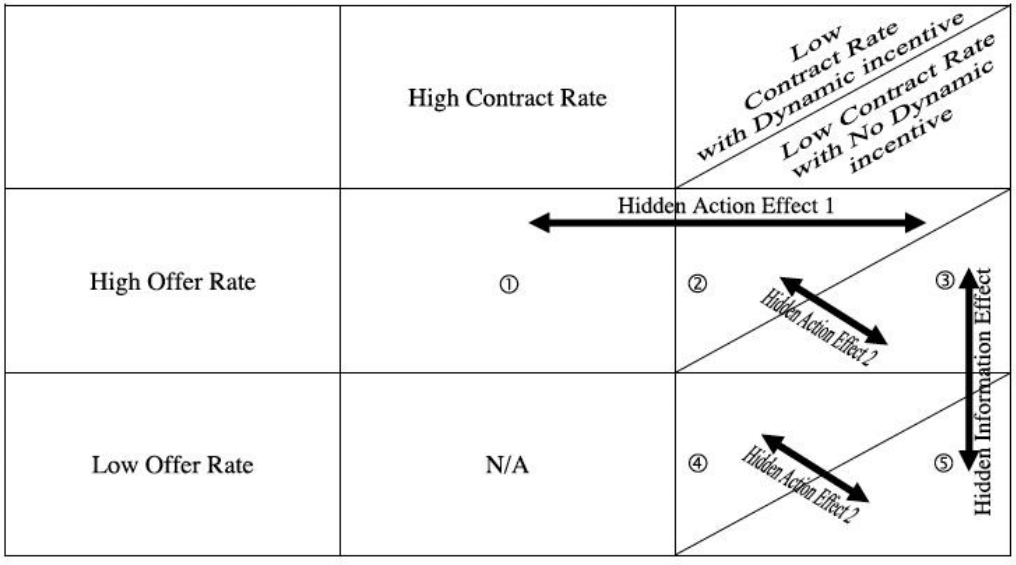
Karlan & Zinman, Econometrica 2009: "Observing unobservables"



- Trick: offer loan clients a high interest rate; then surprise a randomly chosen subset with better terms: either a lower interest rate on the contract; or a "dynamic incentive", i.e. they can borrow again if they remain in good standing; or both.

How important are these asymmetries?

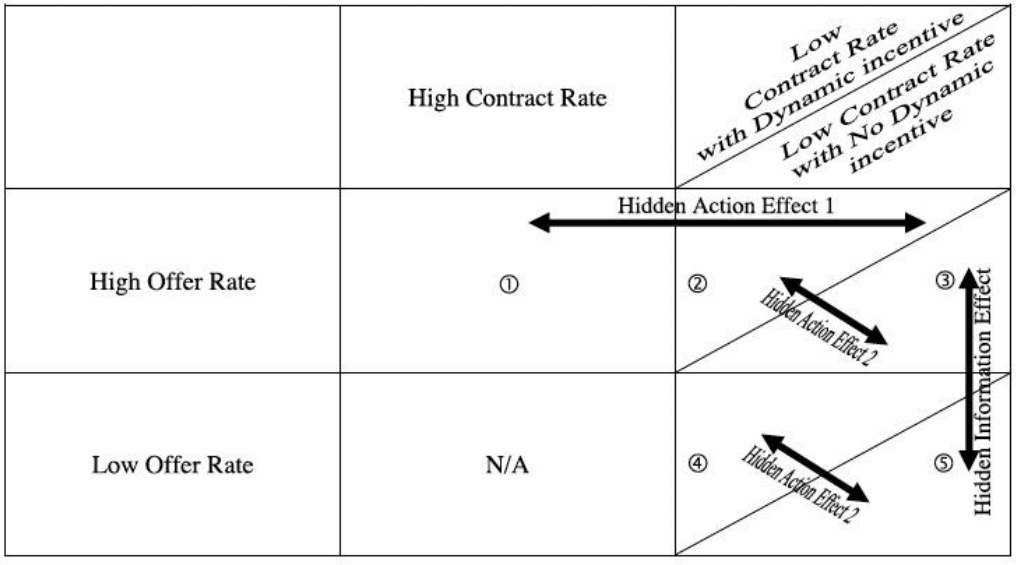
Karlan & Zinman, Econometrica 2009: "Observing unobservables"



- "Hidden action effect" = moral hazard: compare people with and without incentives to remain in good standing (they're similar otherwise). If those without dynamic incentives default more, that's moral hazard.
- "Hidden information effect" = adverse selection: compare people with the high vs. the low offer rate (they're similar otherwise). If those with the high offer rate default more, that's adverse selection.

How important are these asymmetries?

Karlan & Zinman, Econometrica 2009: "Observing unobservables"



- The results suggest that adverse selection is not important, but moral hazard is: dynamic incentives make a difference. About 13–21% of defaults are due to moral hazard.

How microcredit tries to overcome these problems

- Microcredit: Was first popularized by Grameen Bank in Bangladesh, founded by Muhammad Yunus
- Core features:
  - No or little collateral required
  - Joint liability: loans are made to group of borrowers, who have to cover for each other
  - Often target women
  - Dynamic incentive schemes: can only get a future loan if you pay off the current one

How microcredit tries to overcome these problems

- Ghatak (1999) provides an explanation how microcredit overcomes **adverse selection**: Safe borrowers will want to team up with other safe borrowers, who don't need to be bailed out by them. In contrast, risky borrowers will often have to bail out their group members. If that provides enough protection against these risky borrowers, the interest rates for everyone can be kept low enough that the safe borrowers are not forced out.
- **Ex ante moral hazard** (choice of risky projects): The group might have more information than the bank: they can better observe whether my project is risky, and keep me from pursuing it because it means they may have to bail me out.
- **Ex post moral hazard**: not repaying strains relations with the other group members because they have to bail me out, and prevents me and them from borrowing again in the future.

Empirical evidence on microcredit

AEJ-Applied special issue 2015: 6 randomized evaluations of microcredit

Front Matter (pp. i-vi)

Six Randomized Evaluations of Microcredit: Introduction and Further Steps

Abhijit Banerjee, Dean Karlan and Jonathan Zinman

(pp. 1-21)

The Miracle of Microfinance? Evidence from a Randomized Evaluation

Abhijit Banerjee, Esther Duflo, Rachel Glennerster and Cynthia Kinnan

(pp. 22-53)

The Impacts of Microcredit: Evidence from Ethiopia

Alessandro Tarozzi, Jaikishan Desai and Kristin Johnson

(pp. 54-89)

The Impacts of Microfinance: Evidence from Joint-Liability Lending in Mongolia

Orazio Attanasio, Britta Augsburg, Ralph De Haas, Emla Fitzsimons and Heike Harmgart

(pp. 90-122)

Estimating the Impact of Microcredit on Those Who Take It Up: Evidence from a Randomized Experiment in Morocco

Bruno Crépon, Florencia Devoto, Esther Duflo and William Parienté

(pp. 123-50)

Microcredit Impacts: Evidence from a Randomized Microcredit Program Placement Experiment by Compartamos Banco

Manuela Angelucci, Dean Karlan and Jonathan Zinman

(pp. 151-82)

The Impacts of Microcredit: Evidence from Bosnia and Herzegovina

Britta Augsburg, Ralph De Haas, Heike Harmgart and Costas Meghir

(pp. 183-203)

Empirical evidence on microcredit

American Economic Journal: Applied Economics 2019, 11(1): 57–91
https://doi.org/10.1257/app.20170299

Understanding the Average Impact of Microcredit Expansions: A Bayesian Hierarchical Analysis of Seven Randomized Experiments†

By RACHAEL MEAGER*

Despite evidence from multiple randomized evaluations of microcredit, questions about external validity have impeded consensus on the results. I jointly estimate the average effect and the heterogeneity in effects across seven studies using Bayesian hierarchical models. I find the impact on household business and consumption variables is unlikely to be transformative and may be negligible. I find reasonable external validity: true heterogeneity in effects is moderate, and approximately 60 percent of observed heterogeneity is sampling variation. Households with previous business experience have larger but more heterogeneous effects. Economic features of microcredit interventions predict variation in effects better than studies' evaluation protocols. (*JEL* D14, G21, I38, O12, O16, P34, P36)

Empirical evidence on microcredit

American Economic Journal: Applied Economics 2015, 7(1): 183–203
http://dx.doi.org/10.1257/app.20130272

The Impacts of Microcredit: Evidence from Bosnia and Herzegovina†

By Britta Augsburg, Ralph De Haas, Heike Harmgart, and Costas Meghir*

We use an RCT to analyze the impacts of microcredit. The study population consists of loan applicants who were marginally rejected by an MFI in Bosnia. A random subset of these were offered a loan. We provide evidence of higher self-employment, increases in inventory, a reduction in the incidence of wage work and an increase in the labor supply of 16–19-year-olds in the household's business. We also present some evidence of increases in profits and a reduction in consumption and savings. There is no evidence that the program increased overall household income. (*JEL* C93, G21, I38, J23, L25, P34, P36)

Next time

- We'll talk about agriculture and risk.
- Lecture 4: Thu 16/9 08:00–10:00, Auditorium 4, Södra huset hus B