Credit II: Understanding Credit Constraints

14.740x: Foundations of Development Policy

Professor Abhijit Banerjee

How Serious Are Those Constraints?

If moral hazard are real, the credit market can lead to a *poverty trap*, at the individual level and at the societal level. Another problem may be adverse selection: high interest rates may discourage people who are planning to repay, and encourage people who have low cost of default and were planning to default anyway. How serious are they?

1. Are market interest rates higher than the profits the poor could make with their businesses?
2. Do high interest rates increase adverse selection?
3. Do high interest rates increase *ex-post* default?
4. Is there moral hazard in the credit market?

The High Interest Rate

- Interest rates will be highly sensitive to the cost of monitoring and the cost of funds: They are highly variable. Many examples: e.g., interest rates in Pakistani villages can vary from 2% to 150% (Irfan Aleem).
- The poor borrow less and pay higher interest rates. Interest rate on daily loans for vegetable and fruit vendors in India can be up to 5% *per day* (Dean Karlan and Sendhil Mulainathan).
- Interest rates of 3% to 4% per month are common.

High Interest Rates and the Demand for Credit

Are the poor excluding themselves from the credit market because the rate of return on their projects won't be very high?

- *Prima facie* does not seem to be the case: The poor borrow at those rates. Furthermore, in informal markets, defaults are rare, and most loans appear to be taken for productive purposes.
- However it could be that only those with high rates of return agree to borrow: Average rates could still be lower (but still higher than a "reasonable" interest rate).
- More direct evidence on returns to capital is given by an experiment in Sri Lanka.
- More direct evidence on elasticity of demand of credit to interest rate is given by an experiment in South Africa.

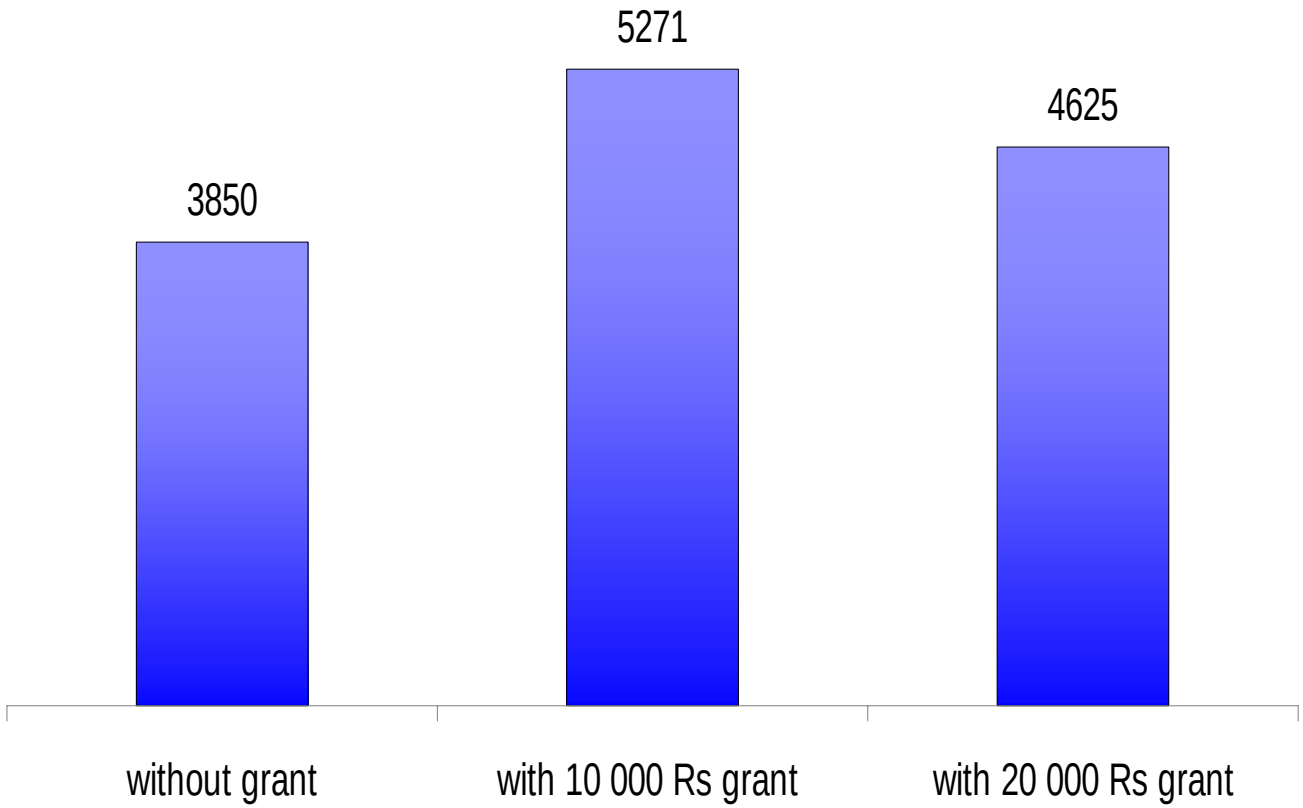
The Returns to Capital for Micro-Entrepreneurs: Sri Lanka

- A study by Suresh de Mel, David McKenzie and Christopher Woodruff
- Starting from a census, identified 405 households which had a small business (retail or manufacturing), with less than $1,000 in fixed capital (excluding land and building).
- Most of the firms have very little in the way of assets (about $100 in machinery or stock).
- Conducted a survey and offered, as an encouragement to participate in the survey, a random prize drawing:
- Prize was a small grant ($100 or $200) either in cash or kind of asset, or stock. $100 is equivalent to 3 to 6 months profit. Cash grants were unrestricted.
- Follow-up survey data was collected on all firms.

Results

- Treatment increased real monthly business profit by 5.7% on average: very high returns, greater than the monthly interest rates observed in urban area.
- Return decrease steeply: \$200 led to no more profit than \$100. ▸ Figure

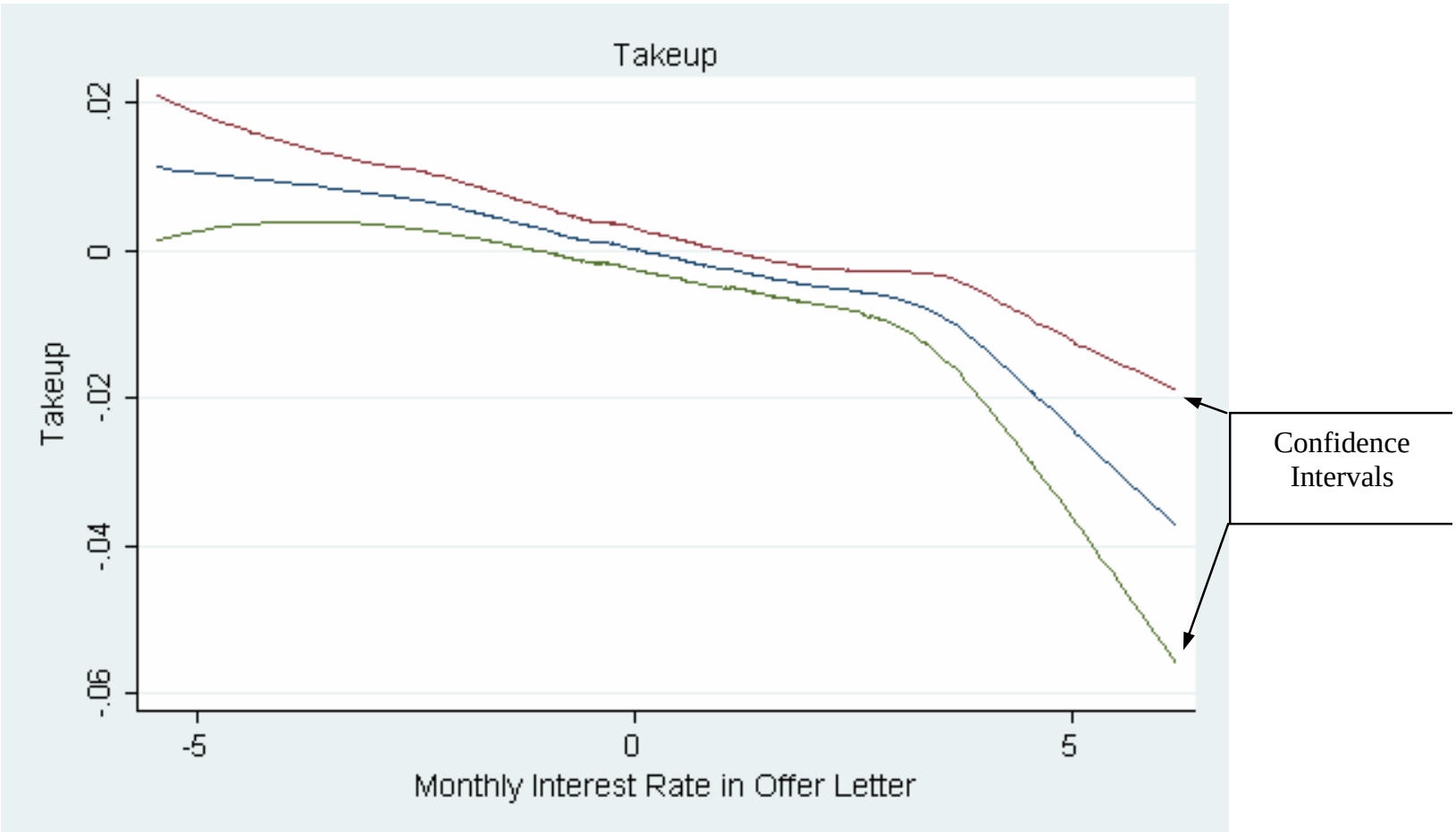
Net Profit in Follow-up Waves (Rupees)



How Sensitive is the Demand for Credit to Interest Rates?

- Thus, the poor have profitable investment opportunities: They should be willing to borrow, even at high interest rates.
- What is their sensitivity to interest rates?
- To find it out, Dean Karlan and Jonathan Zinman worked with a consumer credit firm in South Africa.
- Average interest rate: between 7.75% and 11.75% depending on risk class.
- Bank sent letter to offer credit at a specific rate to over 55,000 former clients.
- Both interest rate and suggested reimbursement duration were randomized:
  - Offer rates were randomized (96% below usual rate, 4% above).
  - The *suggested* loan maturity was also randomized (although it was not binding: They could choose another maturity when the applied).

The Sensitivity of Credit Demand with Respect to Prices



Results

- Within a limit, clients are not very sensitive to interest rates variation: Reducing interest rate by 1% from current level would increase take-up of credit by 0.3 percent (take-up of credit: 8%).
- Clients more sensitive to interest rate *increase*: Institution probably prices at optimal level.
- Similar results for loan size.
- Sensitivity to repayment duration is much larger: Increasing suggested duration of reimbursement by 1 month increase take-up by about 15%.

A (Serious) Caveat: Do Clients Really Understand the Interest Rate?

- Some microfinance institutions charge very high interest rates. Compartamos in Mexico: 100% a year.
- Yunus spoke very strongly against those organizations: "They are no better than the moneylenders we tried to displace."
- Answer commonly given by institutions who charge a high rate: But if clients are willing to borrow at these rates, why wouldn't we lend it to them at that rate?
- This implies that they understand interest rates. This is not obvious: They are often not very clearly presented. For example, MFI in India presents interest rates as "flat" (the interest payment always stays the same even as the balance decline: Interest rate is effectively double the stated interest rate).

What Do Clients Pay Attention To?

- To test the power of marketing manipulation, the South African Bank varied at the same time the price of the offer *and* other aspects of the offer letter (such randomizations are very common in marketing):
  1. Photo: no photo, man, woman;
  2. Language affinity ("we speak your language"),
  3. "Special rate," "low rate," no blurb;
  4. Suggested use;
  5. Number of suggested maturities and loan sizes;
  6. Interest rate explicitly disclosed, or client needs to infer from example loans;
  7. Comparison with competition: loss frame (if you borrow with others you will pay more), or gain frame (if you borrow with us you will pay less); and
  8. Cell phone raffle.

the trusted way to borrow cash

30 October 2003

Shop 11 Checkers Centre
Corner of Waterkan & Lady Grey Street
Paarl 7646
Tel: 021 872 5224

BUSINESS HOURS	
MON - FRI	08:30 - 16:30
SAT	08:00 - 12:00

Ons praat
Afrikaans

A special rate for you.

Congratulations! As a valued client, you are now eligible for a special interest rate on your next cash loan from This is a limited time offer, so please come in by 30 November 2003 to take advantage of this offer.

You can use this cash to buy an appliance, or for anything else you want.

Enjoy low monthly repayments with this offer! Here is one example of a loan you can get under this offer:

Loan Amount	Loan Term	Monthly Repayment
R1000.00	4 Months	R290.00

LOAN AVAILABILITY SUBJECT TO TERMS & CONDITIONS

Loans available in other amounts. There are no hidden costs. What you see is what you pay.

How to apply:

Bring your ID book and latest payslip to your usual branch, by **30 November 2003** and ask for **Mr. Godfrey Farao.**

Mr. Godfrey Farao
Customer Consultant

P.S. Unfortunately, if you have already taken a loan since the date this letter was issued, you do not qualify for this offer.

Results

- Taken jointly, these manipulations affect demand.
- Three manipulations that have a large impact:
  - Photo: Female photo increases loan take up by 0.4% (more than reducing interest rate by 1 percentage point, e.g., 8% to 7% per month);
  - Not giving a specific use increases take up by 0.6% (equal to a 2 percentage points reduction in interest rate); and
  - Proposing only one example increases take up by 0.7% (more than a 2 percentage points reduction in interest rate).
- Thus, while it is difficult to predict *ex-post* what will matter, some seemingly irrelevant manipulations matter as much as the interest rate. This suggests that client awareness may be limited (and we don't fully understand credit demand).

Adverse selection and moral hazard

1. Do high interest rates attract unreliable borrowers? (Adverse selection)
2. Do high interest rates induce unreliable behavior?(Moral hazard)
    1. Do high interest rates increase *ex-post* default?

Observing Unobservables

- How can we identify moral hazard and adverse selection?
- By definition they are hidden...we cannot measure it directly (or the bank would do it themselves!).
- Creative experimental design by Dean Karlan and Jonathan Zinman (with the same South African lender) allows us to make progress on this question.
- Experimental design builds on the previous randomization (randomization of an interest rate *offer* to different people).
- We know that those who receive a higher offer are (somewhat) less likely to borrow.
- Do they reimburse less? Yes.
- Proportion of loan passed due (after maturity):
  - 10.5% for those who receive a high offer, and borrow at high rate.
  - 8.2% for those who receive a low offer, and borrow at low rate.

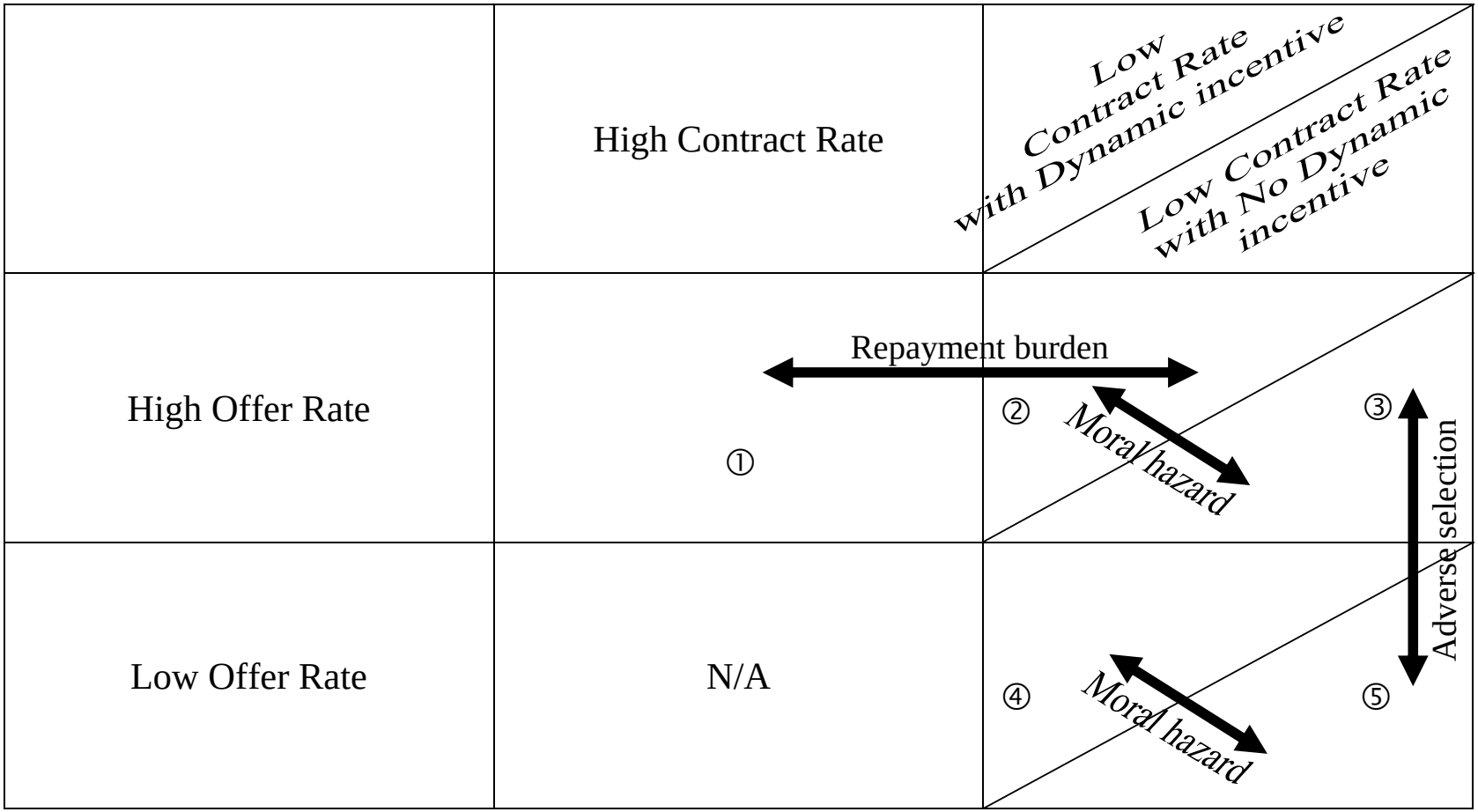
Moral Hazard or Adverse Selection

- It could be because of adverse selection: Those who agree to borrow at high rates are those who were not planning to repay anyway.
- Or it could be due to the *effect* of the interest rate paid, because of:
  - Moral Hazard.
  - Repayment burden.
- Usual identification problem... but here we are directly interested in selection effects.

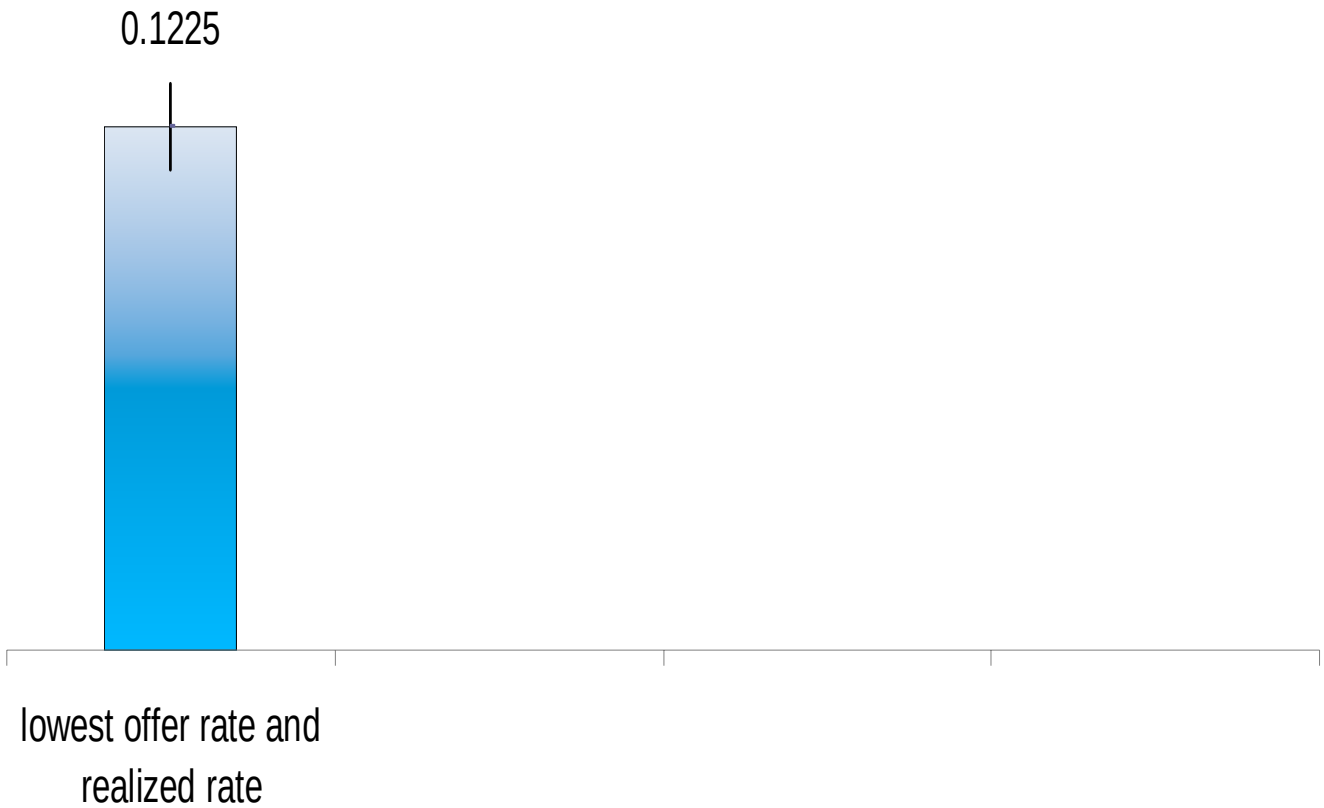
The Solution

- When client comes into the bank, computer sometimes randomly offers a lower rate.
  - Two clients may therefore have faced different offer rate, but end up with the same offer rate: selection effect.
  - Two clients may have faced the same offer rate, but end up with different offer rate: "treatment" effect of the interest rate.
- To identify moral hazard from other *ex-post* effects, among clients who have a low rate:
  - Some get to keep it only for this loan.
  - Some get to keep it for future loan if they repay on time.

Experimental Design



Results



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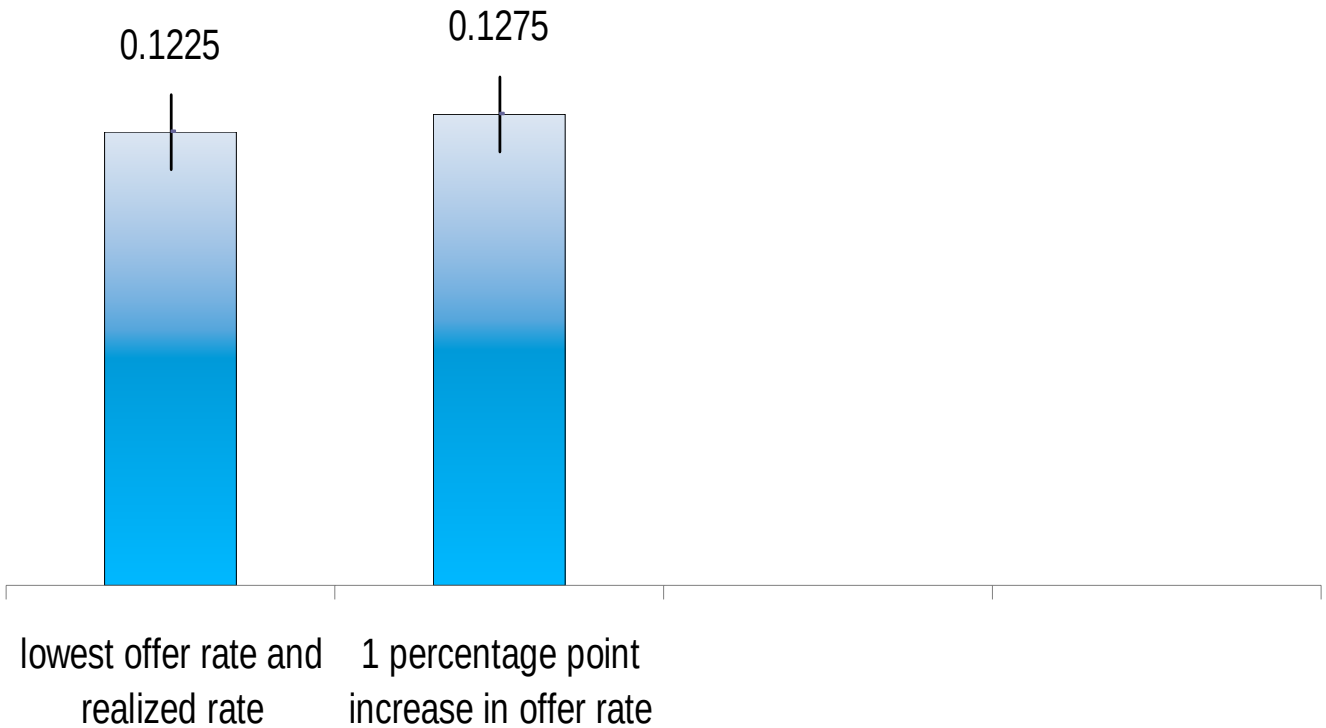
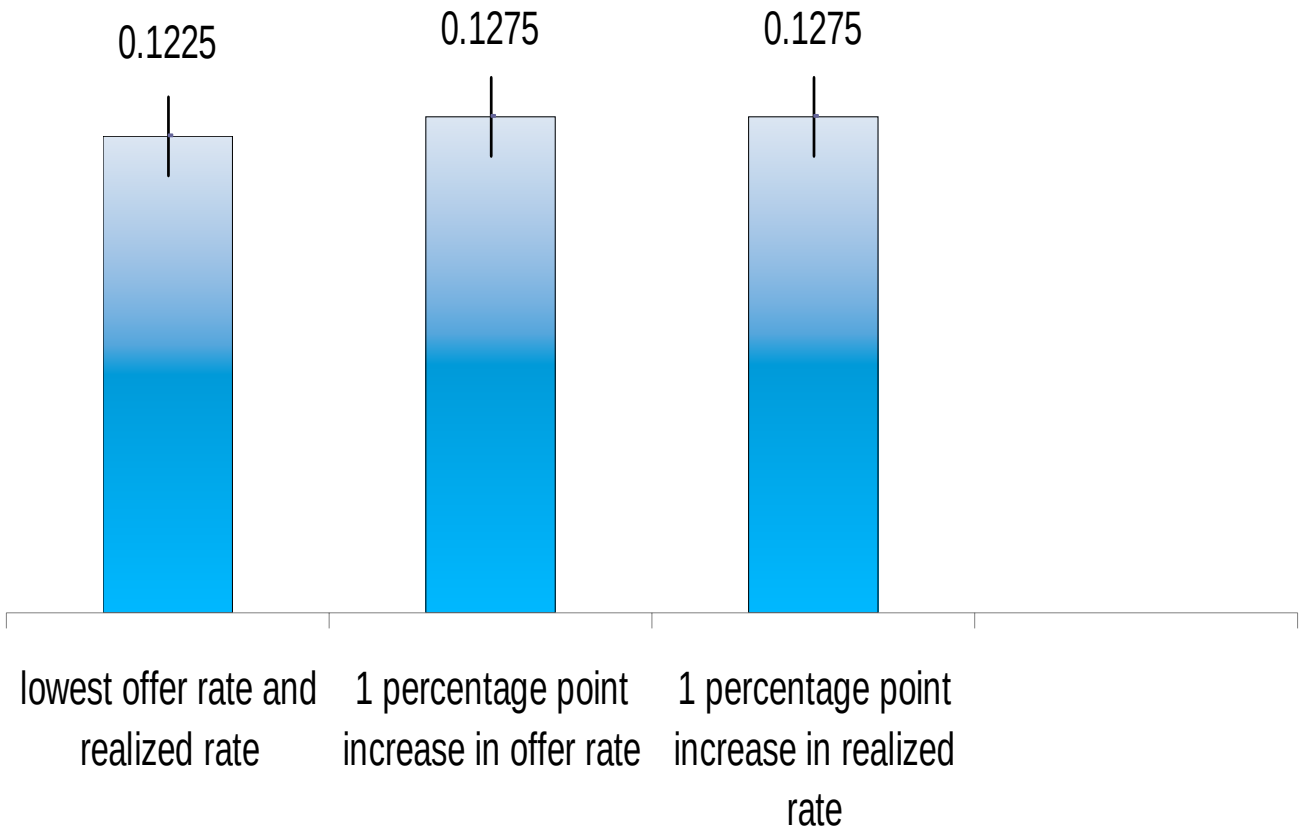

0.1225
0.1275
lowest offer rate and realized rate
1 percentage point increase in offer rate

Results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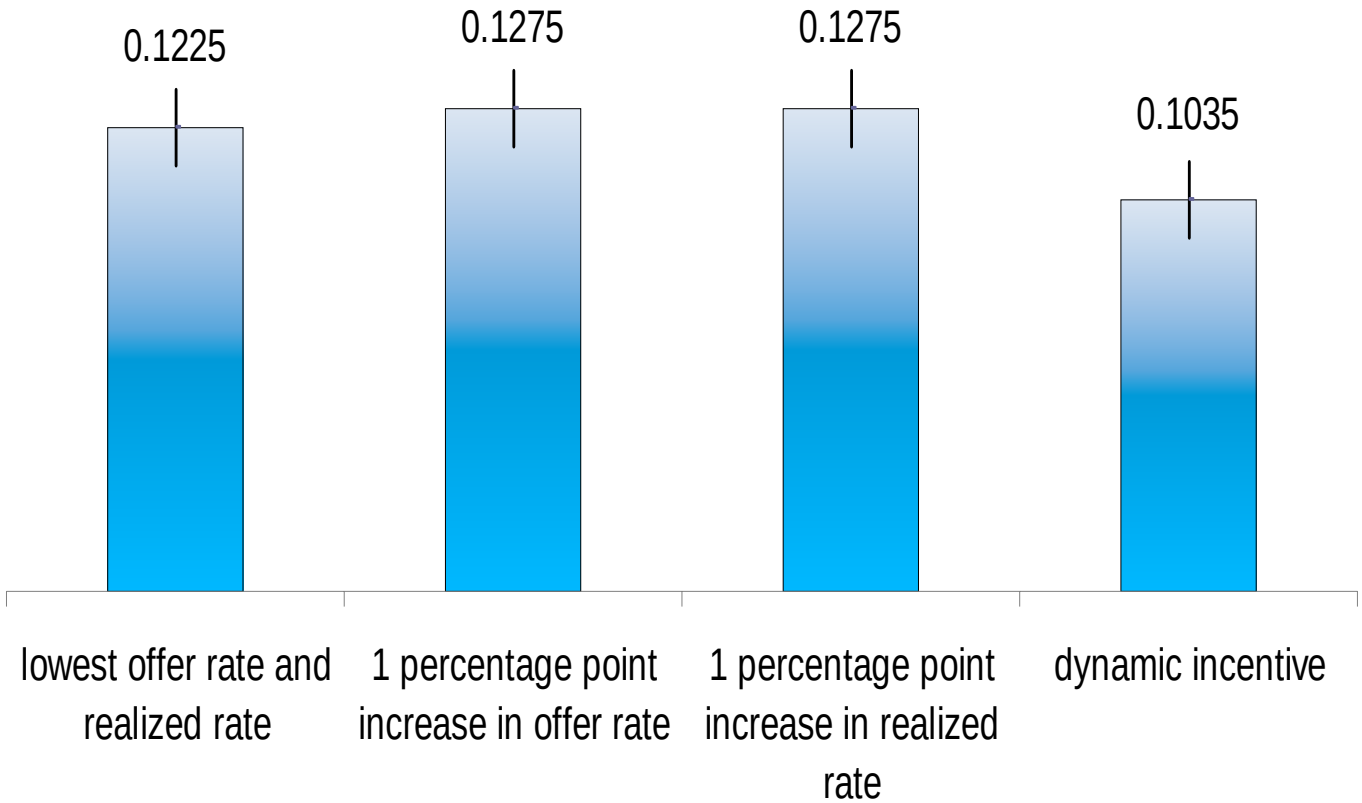
0.1225
0.1275
0.1275
0.1035
lowest offer rate and realized rate
1 percentage point increase in offer rate
1 percentage point increase in realized rate
dynamic incentive

How Serious Are Those Constraints?

If moral hazard and adverse selection constraints are real, the credit market can lead to a *poverty trap*, at the individual level and at the societal level.
How serious are they?

1. Are market interest rates higher than the profits the poor could make with their businesses?
   - Not really: High returns to capital; low sensitivity to interest rates: interest rates can be high.
2. Do high interest rates increase adverse selection?
   - No evidence
3. Do high interest rates increase *ex-post* default?
   - No evidence
4. Is there moral hazard in the credit market?
   - Yes: Dynamic incentives improve repayment.

Other Potential Constraints?

- Bureaucratic behavior in banks
- Moral hazard within banks and the response to that
- Those who have cheap funds have high cost of lending