EE461
Lecture 8: Rural Credit Markets

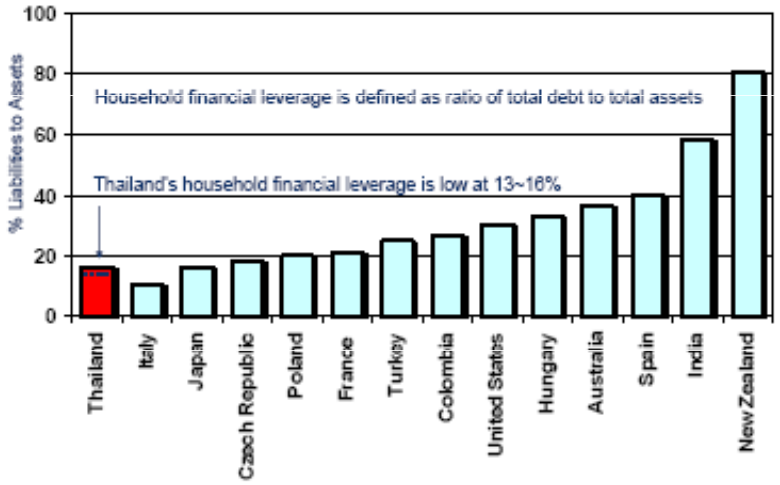
April 7th, 2012

RURAL CREDIT MARKETS OVERVIEW:
ARE CREDITS IMPORTANT?

Who Uses Credit?

- How many of you have a credit card?
- How many of you have (positive) savings?
- How many of you don't have a credit card, but have savings?
- Any one took out other loans?
  - Mortgage, parents, Car-4-Cash, personal loans (Aeon, Yume-plus, etc.)
- Why do you need these?

Household Debt Across The World



Source: CEIC,IMF staff calculations based on data from central bank, National Statistical Office of Thailand. Note: Data for Columbia, India and Japan are as of end-2004; Thailand end-2006.

Why Credit?

- All demands for credit arise for three reasons:

(a) To finance fixed capital acquisitions (e.g. new machines)
(b) To finance working capital (e.g. seeds, fertilizers)
(c) To allow consumption smoothing (e.g. illness)

- Availability of credit is crucial for the functioning of the economy:

- **Why don't the poor use savings?**

What Credit?

- Without savings, two kinds of credit are needed:
  1. **Short-term credit** to purchase inputs (such as seeds, fertilizer, pesticides, herbicides, hired labor).
     - The loan is repaid once the harvest is in.
  2. **Long-term credit** to:
     - purchase land
     - invest in productive capital (tools, machinery, etc.)
     - improve land (irrigation, fencing, removal of stumps. etc.)
     - adopt technology that is risky but more productive
- Working capital and consumption credit are particularly important for the poor in developing economies, because of:

Show me the money!

- Unfortunately, often little credit is available in rural areas, and what little there is may be available at

- The lack of credit is surprising because, on average, the investments that the credit is needed for are very productive.
- The need to grant access to financial services to poor is not new, however
  - failure of state lending policies in favor of agriculture in the 1950-70s
  - supply of services by traditional banks is inadequate

HINDRANCE OF RURAL FINANCIAL ACCESS

Financial Access In Thailand

Reasons for Self Exclusion	Percentage
1. No need	31.63
2. Prefer to borrow from other sources	20.24
3. Other reasons	1.46

Source: BOT

Barriers to Access	Percentage
1. Inadequate financial status/ lack of collateral	9.87
2. Feeling too intimidated/ inhibited to approach banks	1.94
3. Complicated product conditions	1.13
4. Insufficient information/understanding	0.91
5. Have been denied by banks	0.73
6. Distance and traveling time (too far/long)	0.11
7. Other reasons	0.96

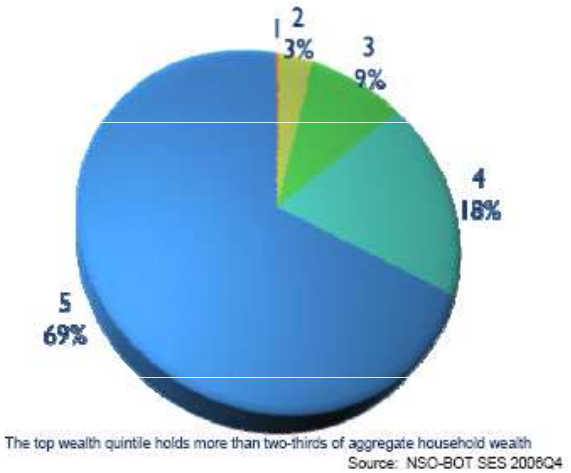
1. Inherent Risk of Agriculture

- Private banks and other private moneylenders are usually in the business to make money, and they can do so only if they are repaid.
  - –If they are certain that they will get repaid, they will lend a lot of money
  - –but if they are , they will limits the amounts they lend, usually lending only to low risk borrowers.
  - –Because *agriculture is often* , lenders will either not make loans to agricultural households, or will
- **Note:** It's the risk of the , not of an

2. Lack of Collateral.

- Lenders want to get repaid (with interest).
- If they have doubts about getting repaid, they want the borrower to pledge some collateral that they can take if the borrower defaults.
- But *rural households*
  - –The main thing they may have is land, which they are reluctant to use as collateral (because if they lose it they will be in big trouble).
  - –In traditional societies where land is allocated by a village leader, the farmer may not have the right to pledge the land as collateral.
- A major problem in Thai banking system, which includes rural areas.

Wealth and Collateral



The top wealth quintile holds more than two-thirds of aggregate household wealth
Source: NSO-BOT SES 2006Q4

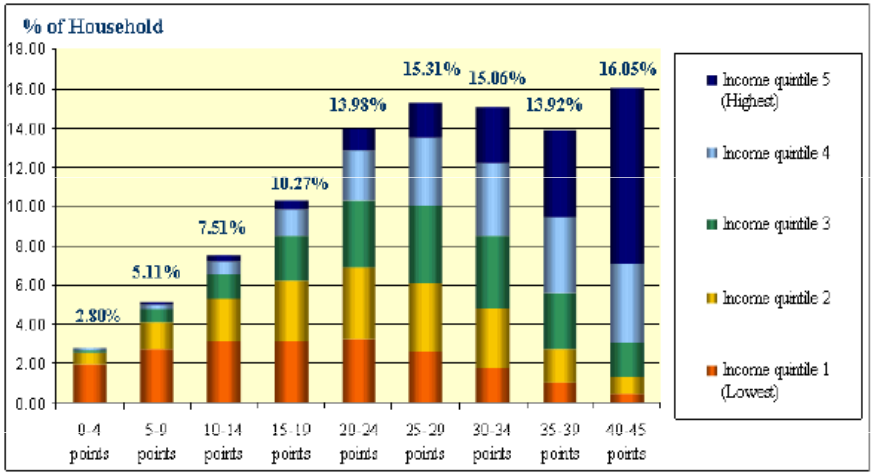
- Collaterals are not for everyone.

3. Underdeveloped Complementary Institutions.

- *Illiteracy* among borrowers, *weak communication* medium (lack of phones, unreliable mail, etc.) and *poor transportation* networks raise the

- Insurance markets (which borrowers could use to increase the probability they will repay), particularly crop insurance,
- Other missing complementary institutions are *information on credit histories* and a *reliable legal system* for enforcing contracts.

Financial Literacy In Thailand



- Low Literacy:
  - (i) low income, (ii) live in rural areas (iii) work as labor workers, (iv) economically inactive/unemployed, or (v) work in the agricultural sector.

4. Covariate Risk.

- Weak communications means that

- There are <u>local moneylenders</u>, but they usually <u>lend only to local people</u>
  - They know these people well and transaction costs are low
  - a big disadvantage : *many "shocks" affect everyone in the village at the same time* (e.g. bad weather or a sharp decrease in the price of the main crop).
- When such shocks occur the moneylender loses a lot of money because many people can't repay. In response,

RURAL CREDIT MARKET FACTS: CHARACTERISTICS OF RURAL LENDING

Sources of Credit for Rural Households

1. **Private commercial banks** *(rare)*
   - Processing costs are large for small loans (as much as 15-40% of the amount lent)
2. **Government banks**
   - especially those whose mandate is to provide credit to agricultural households. This is common in many countries, eg. BAAC in Thailand.
3. **Small private moneylenders** *(very common)*
   - relatively wealthy people in the community who know a lot about the households they lend to
   - often charge high interest rates
4. **Friends and relatives** *(also common*)
   - but for many people their friends and relatives don't have very much money to lend them.

Formal VS. Informal Credits

- **Formal Lenders:** institutional lenders: government banks, commercial banks, and so on
- **Informal Lenders:**
  - marketing agents, salesmen
  - dealer of production inputs
  - Landowner
  - family/friends: 0 interest rate
  - Moneylender
  - Rotating Saving and Credit Association (ROSCA)

Characteristic # 1

- Large gap between lending rates and deposit rates within the same sub-economy.
  - opportunity cost is usually very low in relative terms, economic profits are high.
  - Aleem (1990) reports that, in Pakistan, the average interest rate charged by these lenders is 78.5% while opportunity cost of capital to these money-lenders was 32.5%.
  - Other cases have reported 15-20% margins

Characteristic # 2

- Extreme variability in the interest rate within the same sub-economy.
  - Lending is extremely even for people who are facing similar risks.
  - In India, interest rate could vary from 21-37% on loans to members of local assoc. and 21-120% on loans to non-members
  - standard deviation of the interest rate can be 38.14% with average lending rate of 78.5%.
    - interest rate of and an interest rate of are both within two standard deviations of the mean.

Characteristic # 3

- Low levels of default (surprise?)
  - Default losses for the informal lenders ranged between 0.5% and 1.5% (Timberg & Aiyar (1984))
  - Default costs explain only 14 per cent (not 14 percentage points!) of the total interest costs.
    - Suppose total interest costs is 5%, default costs only account for
  - Median default rate is between 1.5 and 2% and the maximum is 10% (Aleem 1990)

Characteristic # 4

- Production and trade finance are the main reasons given for borrowing, even in cases where the rate of interest is relatively high
  - Gill and Singh (1997) report that the bulk (63.03%) of borrowing from the informal sector goes to finance production. This proportion is lower for the landless laborers but it is a non-negligible fraction (36%).
  - Ghatak (1976) concludes that “the existing belief about the unproductive use of loans ... has not been substantiated.”

Characteristic # 5

- Credit limits:
  - Several lenders said that they would lend no more than 25% of the borrower’s net worth, though another said he would lend up to 33% (Timberg and Aiyar, 1984)
  - The poorest (those with no land assets) pay 45%, while the rich (those with land valued at more than Rs 50k) pay 16-25% in the corresponding villages. (Swaminathan (1991))

RURAL CREDIT MARKET THEORIES: WHY THINGS ARE THE WAY THEY ARE?

Reasons for the Characteristics

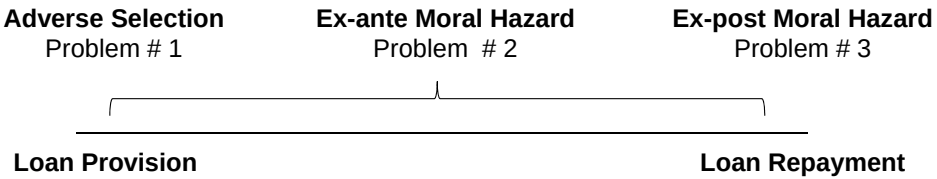
- Asymmetric information problem
  1. Adverse selection →
  2. Ex-ante moral hazard →
  3. Ex-post moral hazard →
- Monopoly power of money-lenders helps circumvent many problems.

1 Asymmetric Information

- Debtor may be unable to repay: ***involuntary default***
  unwilling to repay: ***voluntary default***
- Enforcement problem: loan is a limited liability contract
  - happens when lender has insufficient sanctions against delinquent borrowers:
    - no framework of legal enforcement
    - costs of enforcement are too high
- **Consequence:** a lender may simply cease to lend – a situation that may well arise for poor farmers in developing countries.

Asymmetric Information with Limited Liability

- Efficiency of credit markets impeded by 3 main information problems
  1. information on borrowers' characteristics
  2. information on borrowers' actions
  3. information on borrowers' reimbursement capacity



Case 1: Involuntary Default

- Assume
  - Borrower has to choose between **2 projects**, and lender cannot observe the choice
  - Borrower is subject to *limited liability* and his wealth = 0
  - Both projects require L=100 and i=10% and
  - Project P1 yields 120 with certainty
  - Project P2 yields 230 w/ prob ½ and 0 w/ prob ½
- Which maximizes social welfare?

Case 1: Involuntary Default

- **Is it optimal for the lender to finance either project?**
  - LP(1) =110-100=10
  - LP(2) = ½ (110-100)+ ½(-100) =-45

Because of limited liability, borrower repays 0 if project fails

- **What will the borrower choose?**
  - BP(1)=120-100*(1.1)=10
  - BP(2)= ½ (230-100*(1.1)) +½ (0)=60

Ex-ante Moral Hazard

- **So? Will lender lend?**

Case 2: Voluntary Default ("take the money and run")

- Assume
  - Borrower can only choose P1, which yields 120 for sure, again requiring L=100 and i=10%
  - Borrower is subject to *limited liability* and his wealth = 0
  - Borrower can choose between "honest" (i.e. repay) or "cheat" (i.e. running away with 100)
    - If he runs he *gets caught* with a positive probability, say p=0.6, in which case *the lender seizes the project return* (120)
- **So? Will the borrower run?**
  - "Honest" payoff =120 - 100*(1.1) = 10
  - "Cheat" payoff = 0.4*100 + 0.6*0 = 40
- Borrower prefers to run, so

Ex-post Moral Hazard

Why limited liability matters?

- Assume in contrast that the borrower has *assets worth 110* that can be expropriated in case of default.
- **In case 1 (involuntary default) payoffs are:**
  - BP(1)=
  - BP(2)=
- **In case 2 (voluntary default) payoffs are:**
  - Honesty payoff =
  - Cheat payoff=
- Collaterals *helped align* interest between lenders and borrowers.

Adverse Selection

- Now, imagine there are two types of borrowers
  - Type 1 always choose a safe path
  - Type 2 always choose a risky path
  - Lenders can't tell the difference between the two.
- Clearly, lenders want to charge *higher* interest rate to type 2 lenders, but cannot distinguish the two ➔ can only offer one rate
  - $i^{risky} > i^{*} > i^{safe}$ seems reasonable. Or not?
  - To the extreme, eventually $i^{risky} = i^{*}$, and there would be no safe borrower at all!

Mitigating Information Problems

1. INFORMATION: if banks had cheap ways to gather and evaluate information on their clients.
   – But high transactions costs as handling small transactions is more expensive than a large one.
2. COLLATERAL: if borrowers had marketable assets to offer as collateral.
   – But borrowers are too poor to have much in the way of marketable assets.

Enter the Informal Lenders

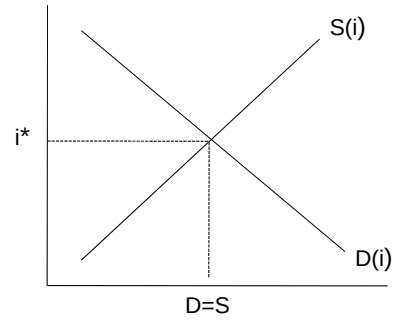
- **Informal lenders can deal better with the poor:**
  – Close-knit communities: easier to gain information and to enforce
  – Multi-market interaction: easier to gain info on risk and easier to accept many forms of collateral (e.g. labor)
  – Repeated interaction: easier to provide incentives not to default

No Easy Credit Market

- **But still information is not "perfect", lenders need to:**
  – Solve the moral hazard problem
  – Solve the adverse selection problem,
- They can do so by using:
  – direct mechanisms (e.g. monitoring)
  – Indirect mechanisms: can lead to credit rationing and interlinked transactions

2 Benchmark Neo-classical Credit Model

- In **complete** and **competitive** markets



- Clearly, $D(i)\uparrow$ or/and $S(i)\downarrow \Rightarrow i^*\uparrow$.
- Adjusting for individual x's credit risk cr_x*, the interest rate faces a borrower equals to $i^*+cr_x^*$.

Absence of Commercial Banks

- If default risks are high, only few, if at all will lend in the market.

- Where
  - *i* is the interest rate bank charges.
  - *q* is the default probability
  - *L* is the loan
- That means, if market rate is 10%, so the required return is (at least) 10%, and if the default rate is 0.5

- ***But:*** What is wrong with this picture?

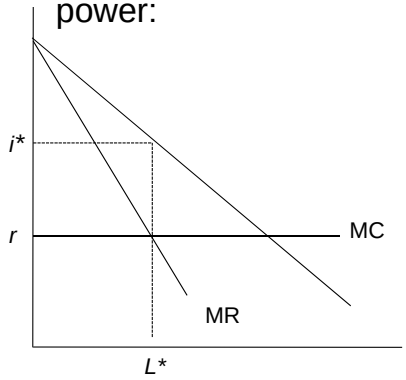
Power of Monopoly

- As Characteristic # 3 suggests, default rate is not that high

Why?

1. The poor treasure access to credit, and will try to maintain a good record, or
2. Informal lenders are often locally wealthy and powerful

- Monopoly power seems a norm rather than exception
- If the moneylender (landlord, for example) has a monopoly power:



Even worse, the monopolist may use different tactics to extract even more rents.

One more piece

- There could be more than one monopolist in the local area, providing funds.
  - Though not everyone will have access to every monopolist, but some will have more than one.

- An analysis along this line reveals that:
  - Interest rate will be higher than typical oligopoly, but lower than monopoly.

MICROFINANCE: LIGHT AT THE END OF TUNNEL?

Towards Microcredit

- The fact that can *monitor you better* than the banks, can explain the system of using guarantors/co-signers for loans.
- The fact that the marginal product is higher than the interest rate means that the investors earn rents. This raises the possibility of using future rents to give incentives for borrowers to behave (i.e. repeated lending).

How It Works?

- A scheme for combining these ideas:
  - Potential borrowers are usually asked to voluntarily form into groups (the goal is to have groups of friends and neighbors).
  - Some or all of them are given a loan with the threat that if any one defaults, all of them will be excluded from future loans.
- The additional trick here is that
  - May have the advantage that the rents that he gets from getting the loan can be used to give him incentives for monitoring, whereas an outside monitor would have to be paid additional incentive rents (efficiency wages)

Possible Concerns

- If outright deliberate default is an option, then borrower may want to borrow as much as possible and then default (Bulow-Rogoff).
- One default could trigger many, as other group members realize that they would be punished in any case (Besley-Coate)
- The monitor may now care so much about default that he may over-monitor the borrower (Banerjee-Besley-Guinnane)

MICROFINANCE IN ACTION

Grameen Bank

- Microfinance and community development bank in Bangladesh
- Group-based, peer-pressure approach
- Aims to promote financial independence among the poor and reduce lender's exploitation
  - opportunities for self-employment
  - reverse the vicious cycle of "low income, low saving & low investment", into virtuous circle of

Grameen Bank

- A channel for women to borrow
- No written contract between Grameen Bank and its borrowers
  - Terms and conditions are too difficult to understand
- Funding: from Agricultural Bank ("Bangladesh Krishi Bank"), Bangladesh Central bank, Ministry of Finance, and deposit
  - As of now, of the total equity of the bank, the borrowers (i.e. the poor) own 94%, and the remaining 6% is owned by the Government of Bangladesh.

Village Funds

- Million baht village funds program initiated by PM Thaksin
  - The intent is for a revolving, self-sustaining fund to be used for in occupational development, employment creation and income-generating activities.
- Currently have almost 80,000 Funds with 10+ million members
  - On average 125 members per fund

Village Funds

- Most lending is less than 20,000 Baht, no more than 1 year
  - Lending above 20K Baht but not more than 50K Baht requires special approval
  - Interest rates range 2-12%
- 70% of Funds also provide saving services.
  - Pledged saving could range from 10 Baht to 500 Baht with average interest rate of 0.5%.
- Successful funds could convert into Village Financial Institution, and start financing its operations by borrowing from BAAC, KTB, and GSB.

Village Funds (Kaboski & Townsend 2009)

- Village fund generally *raises consumption,* but not investment
  - Housing (infrequent) & vehicle (frequent) repairs tend to be the major use
  - Fuel, dairy, alcoholic beverages (at home and outside), and clothing
- One baht of village fund enables purchase of 0.41-0.76 baht fertilizers and 0.63-0.72 baht of consumption
- Credit *significantly lower* asset accumulation, so Village Funds slow asset growth in the villages (physical & financial assets net loans).

Village Funds (Kaboski & Townsend 2009 & 2010)

- Household with credit is 51% *more likely* to have growth in income.
  - Bigger share of (construction) labor & livestock income than agricultural income
  - No impact on business startups → more working caps than investment
- Some household (28%) value it more than its cost, but for the overall program, the cost exceeds benefit by 20%.
- So far, they don't replace informal borrowing (at least initially) yet.

CONCLUSION

So…

- These negative legacies drove the microfinance movement to look to the private sector for inspiration.
  - Combination of the banks' resources with the local informational and cost advantages of neighbors and moneylenders.
  - Like traditional banks, microfinance institutions can bring in resources from outside the community.
  - Dynamic incentives
- Microfinance is not the first attempt to do this, but it is the most successful by far.
  - Thailand needs more grassroots micro finance.