

# Beyond Microcredit

GIVING THE POOR A WAY TO SAVE THEIR WAY OUT OF POVERTY

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# FINANCIAL INTERMEDIATION FOR THE POOR

- *Savers*

- funds to save
- returns on savings low  
*if poor*

- *Borrowers*

- fund to borrow
- interest rates high  
*if poor*

- *Financial Institution*

- gather savings,
- disburse loans,
- more difficult to collect  
information *on the poor*

- *Role for policy*

# FIRST WAVE

*Compares joint liability with individual lending in terms of lending efficiency*

Strands of the literature

*Adverse Selection*

Varian (1990), Ghatak (1999, 2000), Van Tassel (1999),  
Aghion & Gollier (2000)

*Moral Hazard*

Ghatak (1999), Stiglitz (1990), Conning (2000)

*Auditing and Enforcement*

Besley & Coate (1995), Ghatak (1999)

## CRITICISM OF THE FIRST WAVE

- Pitt & Khandkar (1998), Aghion & Morduch (2000), Karlan and Morduch (2009)

Results from *impact evaluation* exercise gloomy

Group lending does not always do better than individual lending

Theory literature under estimates the *practical problems* associated with group lending

*Various mechanisms*, other than group lending, used in microfinance

## SECOND WAVE

Look *beyond joint liability* at the internal mechanism of group lending

Sjostrom and Rai (2005): cross-reporting

Jain and Mansuri (2003): periodicity of loans

Besley Coate Loury (1993, 1994), Klonner (2008, 2013): ROSCAs

Chowdhury (2005), Aniket (2003): Sequential Group Lending

## MORAL HAZARD STRAND

*Recurrent Theme:* it is more efficient to *incentivize effort collectively* for the group rather than individually

Ghatak (1999): incentivizing effort less expensive

Varian (1990): collective project choices more prudent

Conning (2000): incentivizing complementary tasks leads to multiple equilibria

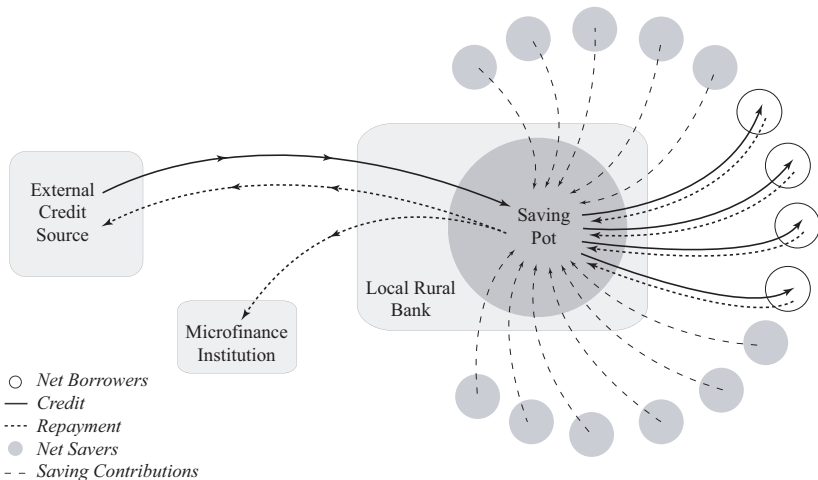
# CASE STUDY

## ⊙ *Case-study of a Microfinance Institution in Harayana*

Documents the innovative design features of India's new national microfinance programme.

- Lender lends only to *groups* not individuals
- Individuals may join a *group* as either a **borrower** or a **saver**  
(depending on their cash-wealth)
  - **Borrowers** partly self-finance their project
  - **Savers** (non-borrower) co-finance the borrower's project (and get a premium interest rate on their savings)
- We observed
  - *Intra-group income heterogeneity*
  - **savers** were poorer than **borrowers**

# CASE STUDY OF SHGs IN HARYANA, INDIA





# MODEL

- ⊙ opportunity cost of capital  $\rho$
- ⊙ Agent  $k$ 
  - Risk neutral
  - Cash wealth  $w_k < 1$
  - Reservation income 0

# PROJECT & EFFORT LEVEL

- Borrower's project

$$1 \text{ unit of capital} \longrightarrow \begin{cases} \bar{x} & \text{with probability } \pi^i \\ 0 & \text{with probability } (1 - \pi^i) \end{cases}$$

- Borrower *chooses* effort level  $i = \{H, L\}$

$$\pi^i = \begin{cases} \pi^h & \text{(High effort level)} \\ \pi^l & \text{(Low effort level)} \end{cases}$$

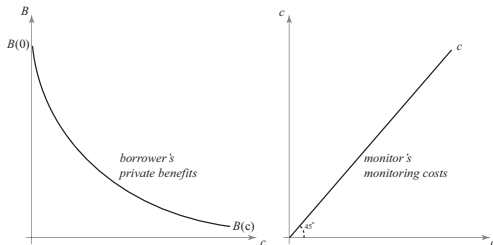
# EFFORT LEVEL & PRIVATE BENEFITS

- ⊙ Borrower  $i$ 's effort unobservable

Effort	Cost of action	Private Benefits
High	0	0
Low	0	$B_i(c_j)$

- ⊙  $j$  monitoring  $i$  with intensity  $c_j$  curtails  $i$ 's private benefits  $B_i$ 
  - cost of  $c_j$  is  $c_j$
  - monitoring unobservable
- ⊙ Private benefits are non transferable amongst agents

# MONITORING



## Assumption (Monitoring function)

- i.  $B(c)$  is continuous and twice differentiable
- ii.  $B(0) > 0$ ,  $\lim_{c \rightarrow \infty} B(c) = 0$
- iii.  $B'(c) < 0$ ,  $B''(c) > 0$ ;

# ENVIRONMENT

- ⊙ opportunity cost of capital  $\rho$
- ⊙ Agent  $k$ 
  - Risk neutral
  - Cash wealth  $w_k < 1$
  - Reservation income 0
- ⊙ Lender
  - Risk neutral
  - No access to monitoring technology
  - Lends at rate  $r$  in a competitive loan market
    - For project that succeeds with probability  $\pi^i$

$$\rho = \pi^i r \quad (\text{L-ZPC})$$

# INDIVIDUAL LENDING

$\rho$  opportunity *cost* of capital

*directly gives us  $r$*

$w_b$  borrower's *self investment* in her project

$$\max \pi^h r (1 - w_b)$$

$$E[b_i | H] \geq \rho w_b \quad (\text{B-PC})$$

$$E[b_i | H] \geq E[b_i | L] + B(0) \quad (\text{B-ICC})$$

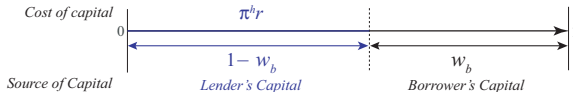
$$r = \frac{\rho}{\pi^h} \quad (\text{L-ZPC})$$

# INDIVIDUAL LENDING

- Borrower's payoff:

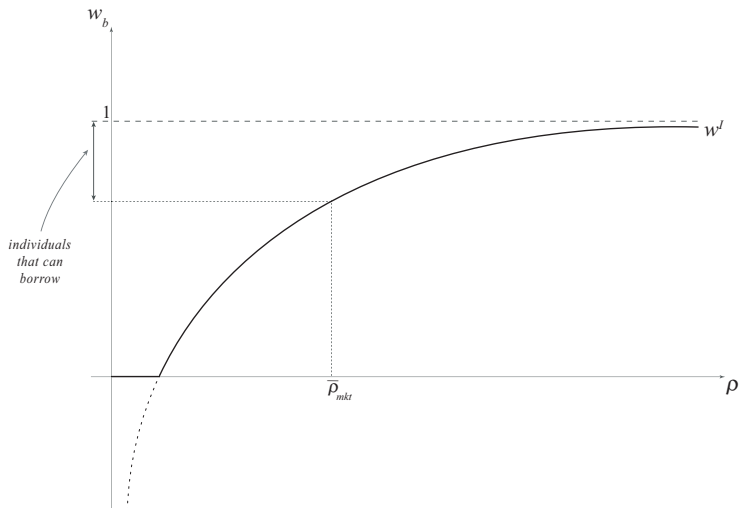
$$\begin{cases} b_s = \bar{x} - r(1 - w_b) & \text{success} \dots \pi^h \\ b_f = 0 & \text{failure} \dots (1 - \pi^h) \end{cases}$$

- Lender's objective function:  $\pi^h r(1 - w_b)$
- Lender's zero profit condition:  $\rho = \pi^h r$



# INDIVIDUAL LENDING WITHOUT SUBSIDY

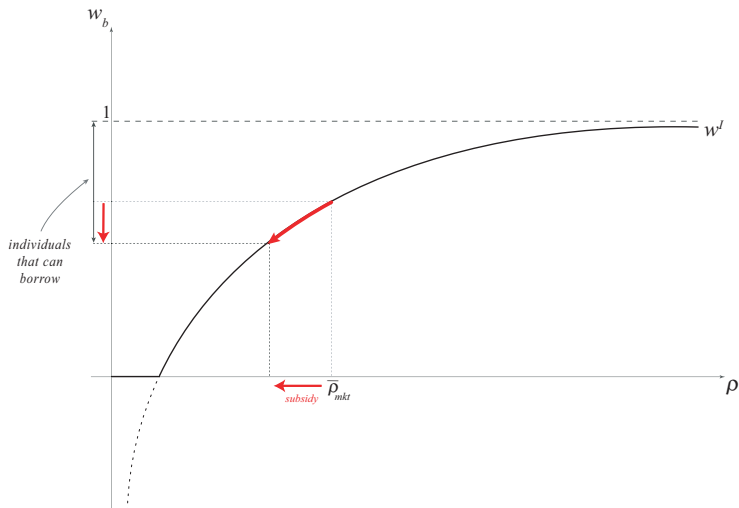
- Lender offers the borrower a contract  $(r, w^l)$  where  $r = \frac{\rho}{\pi^h}$





# INDIVIDUAL LENDING *with Subsidy*

- Lender offers the borrower a contract  $(r, w^I)$  where  $r = \frac{\rho}{\pi^h}$



# GROUP LENDING: *Key Variables*

$\rho$  opportunity *cost* of capital.

*directly gives us  $r$*

$w_b$  borrower's *self investment* in her project

$w_s$  saver's *equity stake* in borrower's project

$c$  intensity with which the *saver* monitors the *borrower*

$R$  returns offered to the borrower

*compensates for opportunity cost of capital  $\rho$   
the premium  $R - \rho$  gives saver incentive to monitor the borrower*

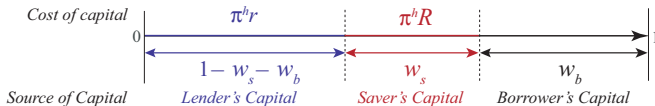
# SAVING IN A GROUP

- ⊙ **Saver** invests  $w_s$  in **borrower's** project
- **Saver's** payoff:

$$\begin{cases} s_s = R w_s & \text{success} \dots \pi^h \\ s_f = 0 & \text{failure} \dots (1 - \pi^h) \end{cases}$$

- **Borrower's** payoff:

$$\begin{cases} b_s = \bar{x} - R w_s - r(1 - w_s - w_b) & \text{success} \dots \pi^h \\ b_f = 0 & \text{failure} \dots (1 - \pi^h) \end{cases}$$



# TIMING

$t=1$  The Lender offers a *group-contract*.

Saver's contract  $(w_s^*, R^*)$

Borrower's contracts  $(w_b^*, \bar{x} - R w_s^* - r(1 - w_b^* - w_s^*))$

$t=2$  The agents *self-select* into roles of *saver* and *borrower* according to their wealth. They subsequently pair up to form a group.

$t=3$  Group borrows  $(1 - w_b^* - w_s^*)$  from lender

- Borrower invests 1 unit of capital in the project.

# TIMING

$t=4$  The saver chooses monitoring intensity  $c$ .

$t=5$  The borrower chooses effort level.

$t=6$  The project's outcome is realised.

- If the project **succeeds**,  $\bar{x}$  gets distributed as follows:

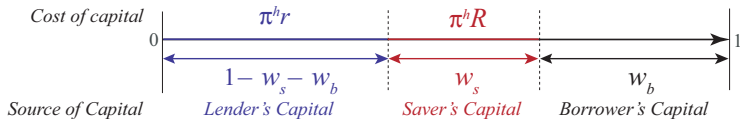
**Saver:**  $R^* w_s^*$

**Lender:**  $r(1 - w_s^* - w_b^*)$

**Borrower:**  $\bar{x} - R^* w_s^* - r(1 - w_s^* - w_b^*)$

- If the project **fails**, everyone gets 0

# LENDER'S PROBLEM



$$\max \pi^h r (1 - w_s - w_b)$$

$$E[s_i | H] - c \geq \rho w_s \quad (\text{S-PC})$$

$$E[s_i | H] - c \geq E[s_i | L] \quad (\text{S-ICC})$$

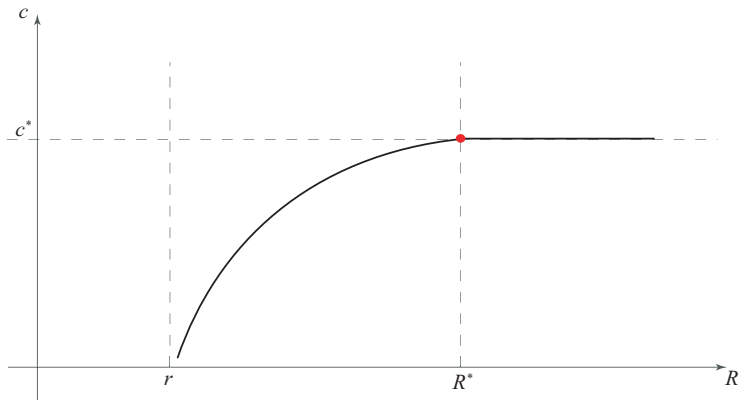
$$E[b_i | H] \geq \rho w_b \quad (\text{B-PC})$$

$$E[b_i | H] \geq E[b_i | L] + B(c) \quad (\text{B-ICC})$$

$$r = \frac{\rho}{\pi^h} \quad (\text{L-ZPC})$$

# LENDER'S PROBLEM

$$\phi = \pi^h r \left[ 1 - \left( w_b(R, w_s(R, c), c) + w_s(R, c) \right) \right]$$



# OPTIMAL CONTRACT

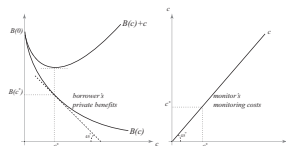
## Proposition

For projects  $\pi^h \bar{x} \geq \rho + c^*$ , the lender induces the *saver* to monitor with intensity  $c^* = B'^{-1}(-1)$  by setting

$$R^* = \frac{\rho}{\pi^l}$$

## Proposition

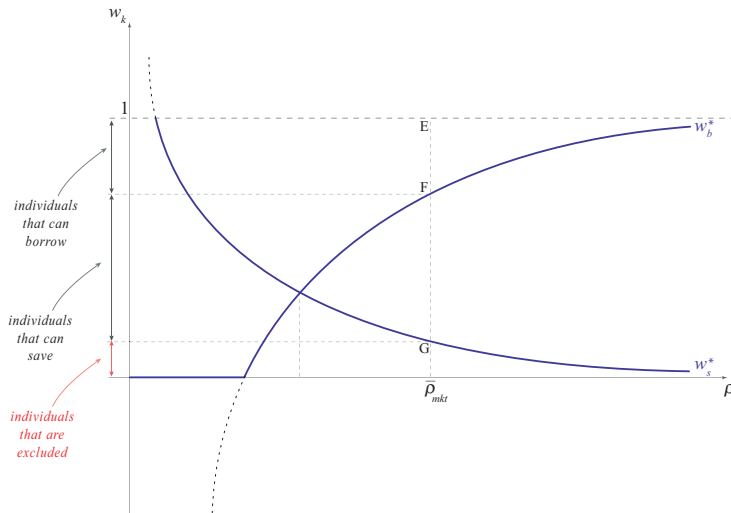
With the optimal contract  $(R^*, c^*)$ , the *borrower* gets *positive rents* and the *saver* gets *zero rents*.





# MINIMUM WEALTH REQUIRED & INTEREST RATE

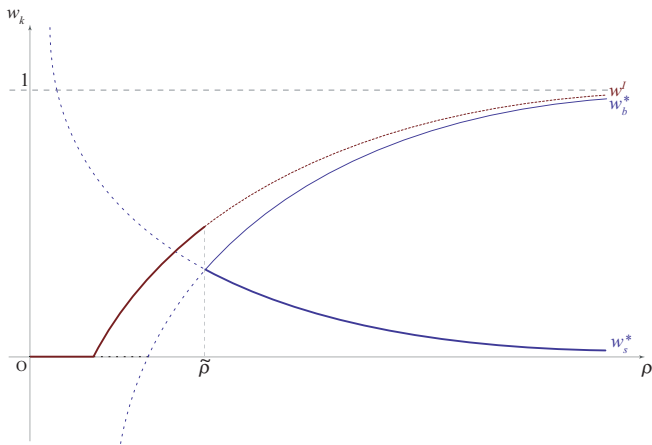
**Saver** gets a contract  $(R^*, w_s^*)$  and **borrower** gets a contract  $(r, w_b^*)$



# GROUP LENDING v INDIVIDUAL LENDING

## Proposition (Group Lending v Individual Lending)

*Group lending is only feasible if  $\rho > \tilde{\rho}$*



# GROUP LENDING v INDIVIDUAL LENDING

## Proposition (Pairing-up)

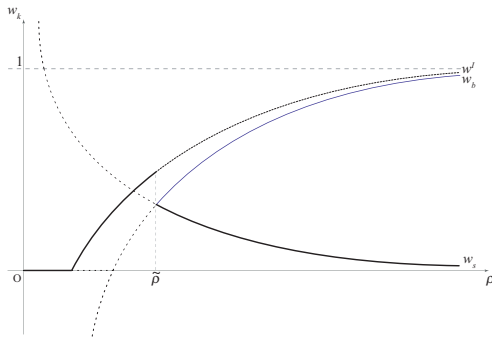
*If  $\rho > \tilde{\rho}$ , a potential borrower will always prefer to pair up with a potential saver and not a potential borrower and vice versa.*

- ⊙ For a potential borrower, pairing up with another potential borrower leads to competition for credit. (*savers get no rent*)
- ⇒ Pairing with a agent who can only save ensures timely credit.
- ⊙ A potential saver can only get premium on her saving by pairing with a potential borrower.

# INTEREST RATE POLICY

## Proposition

*Subsidising the cost of capital decreases the wealth required to participate in the group as a **borrower**. Conversely, it increases the wealth required to participate in the group as a **saver**.*



# ESCAPING THE CREDIT TRAP

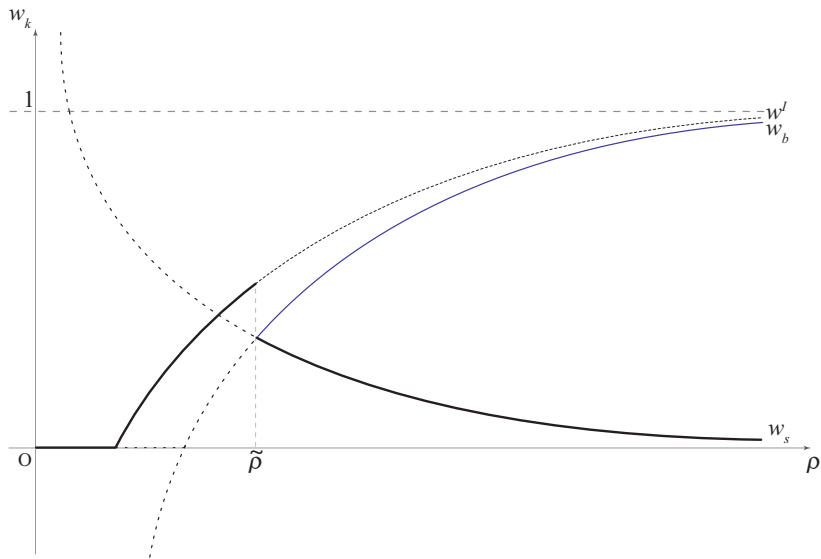
## Proposition

*Subsidising the cost of capital decreases the wealth required to participate in the group as a borrower. Conversely, it increases the wealth required to participate in the group as a saver.*

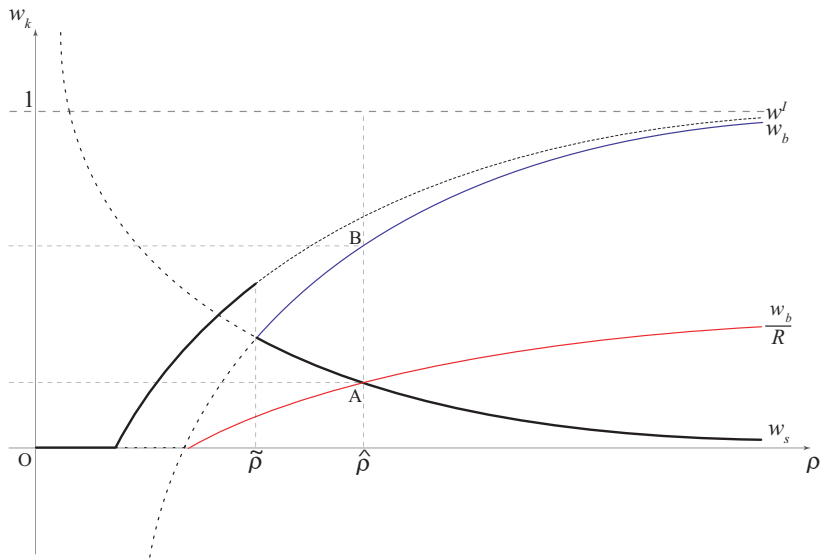
## Proposition (Escaping the Credit Trap)

*There exists a  $\hat{\rho}$  such that for all  $\rho \in (\tilde{\rho}, \hat{\rho}]$  the **savers** are able to accumulate enough wealth to be able to borrow in the next period, if the current project succeeds.*

# ESCAPING THE CREDIT TRAP



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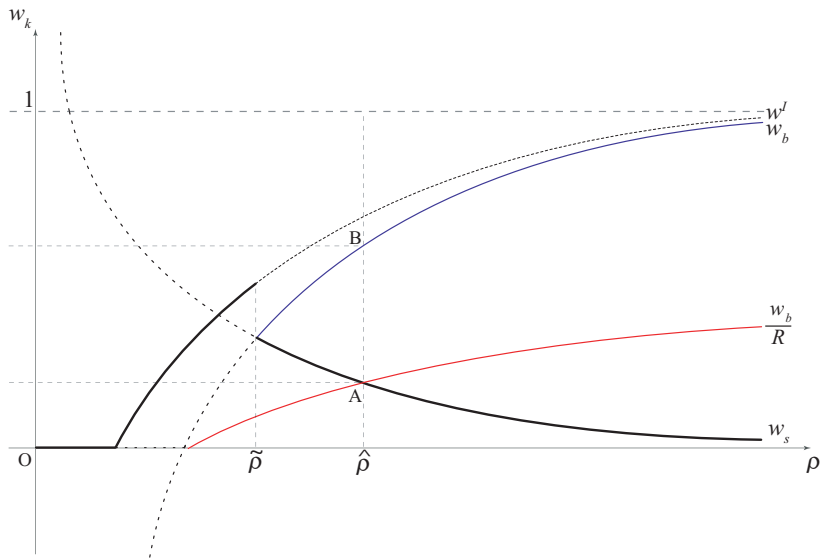
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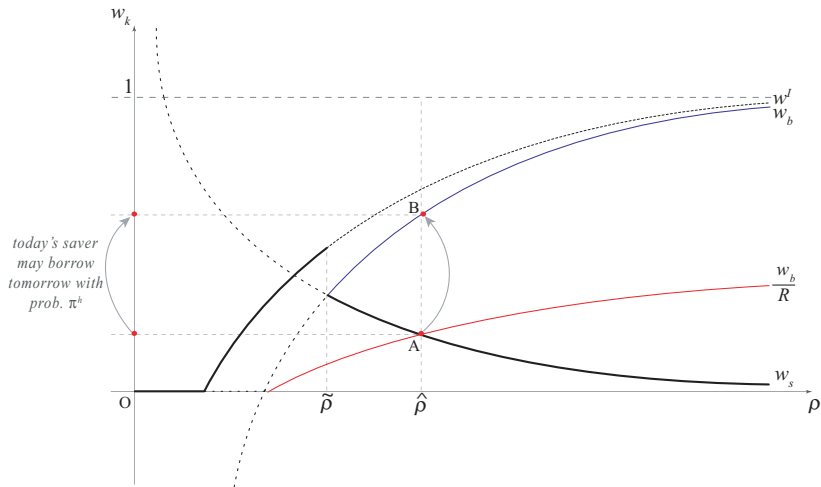
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# ESCAPING THE CREDIT TRAP



# OPTIMAL INTEREST RATE $\rho$



# CONCLUSION

- ⊙ *Does Subsidising the Cost of Capital Really Help the Poorest? An Analysis of Saving Opportunities in Group Lending*
  - Subsidising the cost of capital (interest rate) *reduces* ↓ the cash-wealth required to participate in the group as a **borrower**, thus reaching out to poorer borrowers.
  - Conversely, it *increases* ↑ the cash-wealth required to participate as a **saver**, thus curtailing the opportunity for the poorest to enrich themselves.
  - There exists an optimal cost of capital at which the *poorest savers* today can become tomorrow's **borrowers**.

# CONCLUSIONS

## *Mature Capital Markets*

- allow savers to *match* with borrowers
- task of *monitoring* is delegated to financial institutions
- financial institutions have a distinct *advantage in monitoring* projects (borrowers)

## *Rural Financial Markets*

- savers may have the *advantage in monitoring* projects (borrowers)

## *Microfinance institutions*

- should *physically match* the savers and borrowers and lend to the resulting collective entity
- Matching savers and borrower within group maybe more *efficient* than through capital markets

# CONCLUSIONS

- The *difference* between saving and borrowing returns determines the long run wealth distribution (Matsuyama)
  - Very low returns for *saving* in rural financial markets
  - Cost of *borrowing* very high
    - ... cost of financial intermediation high
- *Matching* savers and borrower within group maybe more efficient than through capital markets