Loan Allocation within Group Lending:
New Evidence from Self-Help Group Program in South India

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### Introduction

#### Background
- Microfinance (MF) has attracted growing attention as a means of improving financial access. Reflecting the enthusiasm about it, Government of India has initiated the biggest MF program since 1992.
- This program adopts a group lending methodology with joint liability based on Self-Help Group (SHG) in which members are designed to be allocated among members by themselves.

#### Motivation
- Despite the proliferation of impact evaluation studies on MF, few studied shed light on loan allocation or actual credit access.
- There exists a black box which contains several questions. How do members allocate microloan within a group? Does there still exist credit rationing among participants caused by this loan allocation?
- This paper empirically explores these question. The objective is to clarify the determinants of loan allocation and credit access within group lending, using original data collected in Kerala, South India.

### The Scheme of SHG program

#### Formation of SHGs
- One SHG is composed by 10-20 women who can be selected based on geographical proximity.
- → self selection, heterogeneity in a group

#### Financial Transactions
- Members are obligated to hold weekly meetings for collecting compulsory savings (10-50 Rs/meeting). And there are two types of loan: the internal loan and the external loan. The internal loan comes from their own accounts accumulated by compulsory savings, while the external loan is disbursed by the formal bank to a group.
- The interest rate, the repayment schedule, and loan allocation are determined by members.
- The external loan can’t be available without repayments of previous loans. Thus only in a beginning of loan cycle can they apply and issue the external loan to members.
- Note that loans are taken from banks in the group’s name but each of the members conducts her business individually.

### Econometric Framework

#### A borrower’s decision making
- The interaction between a applicant and other members may be modeled as a sequential two-stage decision process (Zeller [1994], WD, Mushinski [1999], JDSS).

- **A nested logit model (apply, partial apply, not apply)**
  - The joint probability of choosing alternative $j$ can be written as:
  
  $$P_{ijb} = \frac{\exp(\mathbf{x}_ib^\mathbf{\beta})}{\sum_{j} \exp(\mathbf{x}_{ijb}^\mathbf{\beta})}$$

  where $\mathbf{\beta}$ is a vector of observed attributes that vary across the first-best strategies.

  - $\mathbf{x}$ is a vector of observed attributes that vary across the second-best strategies: factors related to information asymmetries, bargaining power, characteristics of other applicants.

#### Decision making

- **Multinomial logit Model (accept, partial accept, not accept)**
  
  $$\Pr(Y_i = 1) = \frac{\exp(w_i^\mathbf{\theta})}{\sum_{z} \exp(w_z^\mathbf{\theta})}$$

### Data Collection and Survey Area

#### The Data
- The data: 220 households (SHG members) in Sultan Battery gram panchayat, Wayanad district, Kerala, gathered between Aug and Oct 2008.
- Questionnaire: family compositions and labor market participation, landholdings, fixed assets, annual income, credit transactions, gift exchange, and social network etc.
- Note that we also collected the above information on other members who applied in the same loan cycle recorded in financial books of each SHG.

#### How to identify credit rationing
- (almost same method with Boucher, Guiringer, and Trivilli [2006], ERDP)
  - Whether had you applied for a loan in 12 month? If no, why had you not done so? If yes, would you want to applied for another loan? (apply, partial apply, not apply, no demand)
  - Whether any applications were approved? If yes, had your applications been partially accepted? (accept, partial accept, not accepted)

### (A subset of ) Estimation Results

#### Nested multinomial logit model borrower's decision making

<table>
<thead>
<tr>
<th>Coef.</th>
<th>Z-value</th>
<th>Coef.</th>
<th>Z-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant</td>
<td>Partial accept</td>
<td>Not applying</td>
<td></td>
</tr>
<tr>
<td>Permanent income</td>
<td>-0.3505</td>
<td>-2.9179</td>
<td>-0.7371</td>
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<tr>
<td>Transitory income</td>
<td>0.0117</td>
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<tr>
<td>Dummy for default</td>
<td>0.9161</td>
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<tr>
<td>Landholdings</td>
<td>0.1861</td>
<td>0.106</td>
<td>0.0857</td>
</tr>
<tr>
<td>Fixed asset</td>
<td>1.7476</td>
<td>2.5098</td>
<td>1.0999</td>
</tr>
<tr>
<td>Savings in SHG</td>
<td>0.0439</td>
<td>0.2305</td>
<td>0.0195</td>
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<tr>
<td>Social position in village</td>
<td>0.7638</td>
<td>2.2634</td>
<td>0.2087</td>
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<td>Social position in SHG</td>
<td>0.0007</td>
<td>2.4388</td>
<td>0.0008</td>
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<tr>
<td>Distance from formal bank</td>
<td>0.6388</td>
<td>2.9180</td>
<td>0.7503</td>
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<tr>
<td>Fixed effect for social caste</td>
<td>0.0006</td>
<td>2.513</td>
<td>0.0007</td>
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</table>

#### Average of other applicants

<table>
<thead>
<tr>
<th>Coef.</th>
<th>Z-value</th>
<th>Coef.</th>
<th>Z-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant</td>
<td>Partial accept</td>
<td>Not applying</td>
<td></td>
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<tr>
<td>Permanent income</td>
<td>-0.006</td>
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<td>Transitory income</td>
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<td>Dummy for default</td>
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<td>Landholdings</td>
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<td>-2.8778</td>
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<tr>
<td>Fixed asset</td>
<td>-1.1113</td>
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<tr>
<td>Savings in SHG</td>
<td>0.3399</td>
<td>2.5251</td>
<td>0.3379</td>
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<tr>
<td>Social position in village</td>
<td>0.5297</td>
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<tr>
<td>Social position in SHG</td>
<td>1.1038</td>
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<td>1.1604</td>
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<tr>
<td>Fixed effects for SHGs</td>
<td>0.5176</td>
<td>0.2325</td>
<td>0.67</td>
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<tr>
<td>$\tau$</td>
<td>0.7821</td>
<td>0.2903</td>
<td>0.9378</td>
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<td>$\tau$</td>
<td>1.0950</td>
<td>3.4201</td>
<td>4.8021</td>
</tr>
</tbody>
</table>

### Conclusion

#### The access to microcredit is not necessarily guaranteed for all of members in SHGs and loan is allocated in group lending with two types of credit rationing.
- This paper focuses on a bargaining process in loan allocation to clarify the determinants of both types of credit rationing.

- A potential borrower would be preliminary rationed by lack of creditworthiness, insufficient implicit collateral requirements, weak bargaining power, transaction costs and, urgent needs by others.
- There might be a selection based on creditworthiness, political distortion, and wealth bias in loan allocation.

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**Notes:**
- **Effective demand:** This term is the inclusive value in the first-best choice.
- **Partial accept Not accept**
- **Supply-side rationing**
- **Multinomial logit Model**
- **The Data**
- **A nested logit model**
- **How to identify credit rationing**
- **Estimation Results**

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**Tables:**
- **Estimation Results**
- **Data Collection and Survey Area**
- **Econometric Framework**
- **Background**

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**Figures:**
- **The Scheme of SHG program**
- **A borrower’s decision making**

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**Formulas:**
- **A nested logit model**
- **Multinomial logit Model**

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**References:**
- Zeller [1994], WD, Mushinski [1999], JDSS.