Asymmetric Group Loan Contracts

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Williams College

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Microfinance - Group Loan Contracts

- Microfinance. A spectrum of products that lower the operational costs of un-collateralized small loans by innovative means

Common practices by MFIs: group loans, loans with dynamic incentives, loans with high repayment frequency

Group loans. A group of socially-connected borrowers receive loans jointly; motivate and enforce each other's diligent behavior: Social capital replaces physical collateral, lowers operational loan collection efforts by MFIs and thereby the interest charges

Two forms of GL:
1. GL w/ joint-liability. Borrowers within a group are formal guarantors of each other's loan repayment: rationalizing peer pressure. Pioneered by Grameen Bank (and Muhammad Yunus) in 1970s
2. GL w/ individual-liability. No formal guarantor-ship: behavioral motives. Grameen Bank switched from joint-liability group loans to individual-liability group loans over the recent years
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4. Individual liability loans by new-generation MFIs exhibit high interest rates: 30-90% interest rates per annum (Compartamos, a large MFI in Mexico, known to charge 94% annual interest rate)

5. Anecdotal evidence: some MFIs revert to unpleasant loan enforcement techniques in collecting repayments
Research Questions and Proposal

Why don’t joint-liability group loan contracts perform too well and how could their performance be increased?

- We argue that widely-practiced symmetric joint-liability loans with symmetric contractual terms:
  1. either induce repayment instability (due to equilibrium multiplicity)
  2. and/or, lower MFI profits

  Intuition: With symmetric contracts a free-riding problem may cause a failure to coordinate towards joint repayment outcome

We propose asymmetric joint-liability loans as the remedy:

▶ The involvement of an optimally incentivized lead borrower
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Two papers and upcoming field research

- Carli and Uras (2017): Joint-Liability with Endogenously Asymmetric Group Loan Contracts

- Carli, Suetens, Uras and Visser (2024): Asymmetric Group Loan Contracts: A Lab Experiment

- Planned field research in Bolivia, Oct-Nov 2024, as part of a Dutch-Research-Council grant project
Outline for the Talk

- Theoretical Foundation for Asymmetric Group Loans
- Lab Experiment Evidence
- The Lab-in-the-Field and RCT Plan in Bolivia
Literature on Group Loan (In)efficiency

- **Group Lending Efficiency (Theory):** Besley and Coate (1995); Rai and Sjostrom (2004); Gangopadhyay et al. (2005); Ahlin and Townsend (2007)

- **Group Loans (Experimental):** Karlan et al. (2010); Cason et al. (2012); Feigenberg et al. (2013); Gine and Karlan (2014); Attanasio et al. (2015); Banerjee et al. (2015)

- **Leader in Group Loan Contracts (Empirical):** Paxton et al. (2000); Hermes et al. (2005); van Eijkel et al. (2011)

- **Asymmetric Group Loans (Theory):** Gangopadhyay and Lensink (2014)
Theory
Overview of the Theoretical Framework

- Characterize the optimal group lending contract with costly peer monitoring

- Costly monitoring à la Holmstrom and Tirole (1997):
  - Projects financed by microfinance institution (MFI)
  - In the absence of monitoring effort a borrower has high temptation to shirk (moral hazard*), lowering the likelihood of a project’s success
  - MFI’s objective:
    - Facilitate intra-group peer monitoring (induce diligent behaviour)

*: Karlan and Zinman (2009) find out that MH is an important concern in micro/small-loan context in a developing country
Preview of the Key Theoretical Findings

- The optimal contract exhibits joint liability

- **Symmetric joint-liability** (even if repayment schedules are set optimally) may induce equilibrium multiplicity with respect to monitoring behavior

- Getting rid of the non-monitoring equilibrium requires **asymmetric contracting** and the involvement of a group leader, who
  
  ▶ is incentivized to take care of the joint-liability scheme (relative to her borrowing partner)
  
  ▶ gets compensated in expected terms

- These results hold for a group of borrowers homogeneous in **productivity, risk aversion, and monitoring costs**
Environment

- A lending Problem a la Holmstrom and Tirole (1997):
  - Single consumption/investment good
  - Agents: Risk neutral MFI, B₁ and B₂
    - \( MFI \):
      \[
      \begin{align*}
        \text{\( \infty \) elastic supply of investment cash} \\
        \text{monitoring: } \psi_{MFI}
      \end{align*}
      \]
    - \( B_i \):
      \[
      \begin{align*}
        \text{no endowment} \\
        \text{technology: } 1 \quad \rightarrow \tilde{\theta} \begin{cases} 
          \theta & p_i(e_i) \\
          0 & 1 - p_i(e_i)
        \end{cases}
        \text{monitoring: } \psi_i \\
        \text{limited liability}
      \end{align*}
      \]
  - \( \tilde{\theta} \) verifiable and observable, but borrowers can shirk, enjoy private benefit, and reduce the probability of success
  - The environment implies that moral hazard is ex-ante about the investment effort, and not ex-post (no repayment hold-up)
Non-observable investment: $e_i \in \{0, B\}$, where $B > 0$ is a non-pledgeable private benefit, i.e. leisure gain from shirking.

Shirking is socially undesirable:

$$p\theta > 1 > p_B\theta + B,$$

where $p \equiv p(0)$ and $p_B \equiv p(B)$.

Given interest payment $R_i$ limited liability:

$$p(\theta - R_i) > \?
< p_B(\theta - R_i) + B,$$

Assume $p - p_B > p\theta - 1$, so that $\forall R_i \geq 1$:

$$p(\theta - R_i) < p_B(\theta - R_i) + B \Rightarrow$$

Ind-liability cannot enforce no-shirking

Monitoring. If monitored, borrower $i$'s feasible investment set $=$ $\{0\}$

$\Rightarrow$ MFI monitoring is inefficient:

$$\psi_{MFI} > (p - p_B)\theta$$

$\Rightarrow$ Peer monitoring is efficient, $p\theta - 1 - \psi_{i} > 0$, but not observable/verifiable.
Non-observable investment: \( e_i \in \{0, B\} \), where \( B > 0 \) is a non-pledgeable private benefit, i.e. leisure gain from shirking

Shirking is socially undesirable:

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Given interest payment $R_i +$ limited liability:

\[ p(\theta - R_i) > ? < p_B (\theta - R_i) + B \]
Environment - II

- Non-observable investment: $e_i \in \{0, B\}$, where $B > 0$ is a non-pledgeable private benefit, i.e. leisure gain from shirking.

- Shirking is socially undesirable:
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- Given interest payment $R_i +$ limited liability:
  \[ p(\theta - R_i) > ? < p_B(\theta - R_i) + B \]

- Assume \( \frac{p}{p-p_B}B > p\theta - 1 \), so that $\forall R_i \geq 1$:
  \[ p(\theta - R_i) < p_B(\theta - R_i) + B \Rightarrow \text{Ind-liability cannot enforce no-shirking} \]
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p(\theta - R_i) < p_B(\theta - R_i) + B \Rightarrow \text{Ind-liability cannot enforce no-shirking}
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**Monitoring.** If monitored, borrower \( i \)'s feasible investment set = \( \{0\} \)
- MFI monitoring is inefficient: \( \psi_{MFI} > (p - p_B)\theta \)
- Peer monitoring is efficient, \( p\theta - 1 - \psi_{-i} > 0 \), but not observable/verifiable
Group Loan Contract

**Definition**

A group loan contract consists of repayment functions \( \left( R_i^{s_i, s_{-i}} \right)_{i=1,2} \).

- For instance, \( R_1^{H, L} \) is borrower 1’s repayment when her project return is in state \( s_1 = H \) and yields \( \theta \), while borrower 2 project return is in the low state, \( s_2 = L \) and yields nothing.
Timing

Stage 1

Bank offers group loan contract \( \{ R_i^{s_1, s_2} \}_{i=1,2} \)

Borrower \( i \)

A/R

Borrower \( i \) chooses \( \delta_i \in \{ m, n \} \)

Borrower \( i \) learns \( \delta_{-i} \)

Stage 2

Borrower \( i \) chooses \( e_i \in A_i^h \)

State \( (s_1, s_2) \)

realizes

The contract is executed

Borrowers and bank consume
Optimal Contract (Unique Monitoring Equilibrium)

There are 4 possible histories as of stage-2:

1. History (m,m): No-private-benefit is the only option in stage-2, (0, 0)
2. History (n,m): Implement (0, B) in stage-2
3. History (m,n): Implement (B, 0) in stage-2
4. History (n,n): Implement (B, B) in stage-2

=> In stage-1 (super-game): (m,m) becomes the unique equilibrium
Optimal Contract (Unique Monitoring Equilibrium)

\[
\begin{align*}
\max_{R_{1}^{HH}, R_{2}^{HH}, R_{1}^{HL}, R_{2}^{LH}} & \quad p \left\{ p \left[ R_{1}^{HH} + R_{2}^{HH} \right] + (1-p) \left[ R_{1}^{HL} + R_{2}^{LH} \right] \right\} \\
\text{s.t.} & \quad 0 \leq R_{1}^{HH}, R_{2}^{HH}, R_{1}^{HL}, R_{2}^{LH} \leq \theta \\
& \quad pR_{1}^{HH} + (1-p)R_{1}^{HL} \geq \theta - \frac{B}{p-p_{B}} \\
& \quad pR_{2}^{HH} + (1-p)R_{2}^{LH} \geq \theta - \frac{B}{p-p_{B}} \\
& \quad R_{2}^{LH} - R_{2}^{HH} \geq \frac{\psi}{p(p-p_{B})} \\
& \quad R_{1}^{HL} - R_{1}^{HH} \geq \frac{\psi}{p_{B}(p-p_{B})}
\end{align*}
\]

- Cst 6 assigns monitoring as a dominant strategy for \( B_{1} \) (picking \( B_{1} \) for that leader function is wlog), which is required for monitoring-equilibrium \((m,m)\) uniqueness. Cst 5 is \( B_{2} \)'s best response (to monitor) to the monitoring choice by \( B_{1} \).
Optimal Contract (Unique Monitoring Equilibrium)

Proposition

The optimal contract exhibits

- joint-liability, $R_{HL1} > R_{HH1} \& R_{LH2} > R_{HH2}$
- within-group asymmetry, $R_{HH1} < R_{HH2} < R_{LH2} = R_{HL1}$

Implementing a unique monitoring equilibrium gives rise to endogenously asymmetric joint-liability contracting. With equalized expected returns and higher repayment spread for the group leader, equilibrium uniqueness can still be sustained. But, this will lower MFI profits.
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- Implementing a unique monitoring equilibrium gives rise to endogenously asymmetric joint-liability contracting.
- With equalized expected returns and higher repayment spread for the group leader equilibrium uniqueness can still be sustained. But, this will lower MFI profits.
Optimal Contract (Unique Monitoring Equilibrium)

- **Repayment schedules:**
  
  \[ R^{HL}_1 = R^{LH}_2 = \theta \]
  
  \[ R^{HH}_1 = \theta - \frac{\psi}{p_B(p - p_B)} \]
  
  \[ R^{HH}_2 = \theta - \frac{\psi}{p(p - p_B)} \]

- **Expected returns:**
  
  \[ EV_1(m, m) = \left( \frac{p}{p_B} \frac{p}{p - p_B} - 1 \right) \psi \]
  
  \[ EV_2(m, m) = \left( \frac{p}{p - p_B} - 1 \right) \psi \]
  
  \[ EV_{MFI} = \left\{ p\theta - 1 - \frac{p}{p_B} \cdot \frac{p}{p - p_B} \psi \right\} + \left\{ p\theta - 1 - \frac{p}{p - p_B} \psi \right\} \]

  with \( EV_1(m, m) > EV_2(m, m) \)
Key Question

- What if (i) joint-liability & (ii) contractual asymmetry are removed?
Removing Joint-Liability

- No-monitoring in equilibrium
Removing Contractual Asymmetry

There are two ways of removing asymmetry:

1. Remove cst 6 and replace it with the version of cst 5, so to monitor is a best-response for both borrowers but not a dominant strategy for $B^1$:
   - Both $(m,m)$ and $(n,n)$ are equilibria in the first-stage (super-game)
   - Moreover, $(n,n)$ is a Strong Nash
   - A joint deviation would make both borrowers worse off

2. Assign $B^2$ also with a dominant strategy to monitor:
   - Sub-optimal from MFI profitability point-of-view

⇒ Symmetric group loan contracts are either financially unstable and/or un-profitable - compared to asymmetric contracts
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Robustness of the Theoretical Results

Results are robust to:

- Continuous monitoring effort
- Competition in MFI sector
Experimental Evidence
Support for asymmetric contract performance

- Empirical support with observational data is not feasible, because asymmetric group loans are not commonly implemented in practice.

- In Carli, Suetens, Uras and Visser (2024) we generate a parameterized version of Carli and Uras (2017) in experimental lab with student subjects - yielding the following key findings:

1. With asymmetric contracts the involvement of peer monitoring within a group is three times higher than with symmetric contracts.

2. Asymmetric contracts increase MFI profits compared to the symmetric contract - without hurting the borrower welfare.
Experiment Parameterization

### Table C.1: Parameters of the model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>( p )</td>
<td>Probability of success for the good investment project</td>
</tr>
<tr>
<td>( p_b )</td>
<td>Probability of success for the bad investment project</td>
</tr>
<tr>
<td>( \psi )</td>
<td>Monitoring costs</td>
</tr>
<tr>
<td>( B )</td>
<td>Private benefit yielded by the bad investment project</td>
</tr>
<tr>
<td>( \theta )</td>
<td>Investment return in case successful</td>
</tr>
<tr>
<td>( E )</td>
<td>Endowment</td>
</tr>
<tr>
<td>( \epsilon )</td>
<td>used to relax binding 6b</td>
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</tbody>
</table>

### Table C.2: Repayments resulting from calibrated model

<table>
<thead>
<tr>
<th>Symmetric repayment terms</th>
<th>Asymmetric repayment terms</th>
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<tbody>
<tr>
<td>( R_{1}^{HH} )</td>
<td>1.15-1.74</td>
</tr>
<tr>
<td>( R_{2}^{HH} )</td>
<td>1.15-1.74</td>
</tr>
<tr>
<td>( R_{2}^{L} )</td>
<td>0</td>
</tr>
<tr>
<td>( R_{1}^{L} )</td>
<td>0</td>
</tr>
<tr>
<td>( R_{1}^{HL} )</td>
<td>1.84-2.43</td>
</tr>
<tr>
<td>( R_{1}^{LH} )</td>
<td>0</td>
</tr>
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Table C.3: Payoffs in the two-stage symmetric game

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<tr>
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<th>M</th>
<th>N</th>
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<tr>
<td>Good</td>
<td>5, 5</td>
<td>5, 7</td>
</tr>
<tr>
<td>Bad</td>
<td>.</td>
<td>8, 4.5</td>
</tr>
<tr>
<td>Good</td>
<td>7, 7</td>
<td>4.5, 8</td>
</tr>
<tr>
<td>Bad</td>
<td>.</td>
<td>10, 4.5</td>
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Table C.4: Payoffs in the two-stage asymmetric game

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<td>9, 4.5</td>
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<td>10, 4.5</td>
</tr>
<tr>
<td>Good</td>
<td>11, 5</td>
<td>6, 8</td>
</tr>
<tr>
<td>Bad</td>
<td>.</td>
<td>12, 4.5</td>
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9.5, 8.5
Super-game and the Experiment

(a) Symmetric contract

<table>
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<th>M</th>
<th>N</th>
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<td>8, 4.5</td>
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<td>4.5, 8</td>
<td>8.5, 8.5</td>
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(b) Asymmetric contract

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<td>10, 4.5</td>
</tr>
<tr>
<td>N</td>
<td>6, 8</td>
<td>9.5, 8.5</td>
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Super-game and the Experiment

(a) Symmetric contract

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<tr>
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<td>8.5, 8.5</td>
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(b) Asymmetric contract

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<td>N</td>
<td>6, 8</td>
<td>9.5, 8.5</td>
</tr>
</tbody>
</table>

- No MFI / Finance language in experiment instructions
- Participants played 20 rounds of the symmetric contract or asymmetric contract treatment super-game (monitoring choice game)
- Two matching protocols: (i) random partners, and (ii) same partner
- **Main Hypothesis:** The percentage of monitoring is substantially higher with asymmetric treatments than with the symmetric treatments, controlling for the matching protocol
Experimental Results: Monitoring

Figure 3: Monitoring rate by treatment

- Random partners
  - Symmetric
  - Asymmetric
- Same partner
  - Symmetric
  - Asymmetric
Figure 4: Evolution of monitoring rate

Random partners

Same partner

Monitoring rate

Round

Symmetric
Asymmetric
### Table D.1: Effect of asymmetry on monitoring

<table>
<thead>
<tr>
<th></th>
<th>(1) All</th>
<th></th>
<th>(2) Random partners</th>
<th></th>
<th>(3) Same partner</th>
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<tbody>
<tr>
<td></td>
<td>Est. (S.E.)</td>
<td>M.E</td>
<td>Est. (S.E.)</td>
<td>M.E</td>
<td>Est. (S.E.)</td>
<td>M.E</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.147 (0.276)</td>
<td></td>
<td>-0.774 (0.191)</td>
<td></td>
<td>-1.073 (0.331)</td>
<td></td>
</tr>
<tr>
<td>Strangers</td>
<td>0.122 (0.078)</td>
<td>0.122</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asymmetric</td>
<td>1.541 (0.210)</td>
<td>0.546***</td>
<td>1.616 (0.252)</td>
<td>0.581***</td>
<td>1.425 (0.426)</td>
<td>0.496***</td>
</tr>
<tr>
<td>Pseudo $R^2$</td>
<td>0.242</td>
<td></td>
<td>0.259</td>
<td></td>
<td>0.200</td>
<td></td>
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<tr>
<td>Observations</td>
<td>2560</td>
<td></td>
<td>1520</td>
<td></td>
<td>1040</td>
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<tr>
<td>Clusters</td>
<td>34</td>
<td></td>
<td>8</td>
<td></td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>
Experimental Results: MFI Profits

- Asymmetric contracts
  - Require additional information rents to the leader
  - But avoid losses associated with no-monitoring equilibrium
  - Therefore an inquiry is on MFI profits resulting from the experiment
**Experimental Results: MFI Profits**

- Asymmetric contracts
  - Require additional information rents to the leader
  - But avoid losses associated with no-monitoring equilibrium
  - Therefore an inquiry is on MFI profits resulting from the experiment

### Table D.2: Effect of asymmetry on MFI profits

<table>
<thead>
<tr>
<th></th>
<th>(1) All Est. (S.E.)</th>
<th>(2) Random partners Est. (S.E.)</th>
<th>(3) Same partner Est. (S.E.)</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.262 (0.075)***</td>
<td>-0.126 (0.077)</td>
<td>-0.248 (0.095)**</td>
</tr>
<tr>
<td>Strangers</td>
<td>-0.146 (0.075)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asymmetric</td>
<td>0.337 (0.071)***</td>
<td>0.355 (0.0.083)***</td>
<td>0.309 (0.131)***</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.222</td>
<td>0.246</td>
<td>0.142</td>
</tr>
<tr>
<td>Observations</td>
<td>2560</td>
<td>1520</td>
<td>1040</td>
</tr>
<tr>
<td>Clusters</td>
<td>34</td>
<td>8</td>
<td>26</td>
</tr>
</tbody>
</table>
Experimental Results: Borrower Welfare

- Asymmetric contracts do not reduce borrower welfare

<table>
<thead>
<tr>
<th>Table D.3: Effect of asymmetry on profit of borrowers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>Strangers</td>
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<tr>
<td>Asymmetric</td>
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<tr>
<td>$R^2$</td>
</tr>
<tr>
<td>Observations</td>
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<tr>
<td>Clusters</td>
</tr>
</tbody>
</table>
Overview of Theoretical & Experimental Results

Compared to symmetric contracts, asymmetric contracts are:

1. Financially more stable

2. More profitable - without coming in expense of borrower welfare

3. These results are robust to whether borrowers are partners or strangers to each other (experimental) and to the structure of monitoring and MFI market competition (theoretical)

Thus, asymmetric contracts might be a way to address concerns related to group-lending schemes and could alter the recent decline in interest in such contracts.
Design for the Field Research
Motivation for field research

- How would asymmetric group loans perform with actual borrowers?
Upcoming Field Research in Bolivia

Sembrar Sartawi - Bolivia

MFI focus on rural and semi-urban areas
Upcoming Field Research in Bolivia

Sembrar Sartawi - Bolivia

MFI focus on rural and semi-urban areas
Joint-liability lab-in-the-field experiment and RCT

- Sembrar Sartawi - Bolivia
  MFI focus on rural and semi-urban areas
  Joint-liability lab-in-the-field experiment and RCT
Upcoming Field Research in Bolivia

Sembrar Sartawi - Bolivia
MFI focus on rural and semi-urban areas
Joint-liability lab-in-the-field experiment and RCT
Joint work with F. Carli, F. Cecchi, M. Fritz, and R. Lensink
Lab-in-the-Field Theory and Design

- We extend the baseline model (of ex-ante investment moral hazard) and incorporate ex-post moral hazard
  - **Motivation:** Sartawi notes both ex-ante and ex-post moral hazard issues

- The full investment-game, where borrowers monitor theirs peers on
  - investment choices
  - repayment behavior upon completion of production output (separate monitoring decisions)

- Presence of ex-post moral hazard reinforces the equilibrium multiplicity issue and asymmetric loans with lead-borrowers gets rid off bad equilibrium
# Overview of Sartawi Contract

## REG-COM-002
### REGLAMENTO DE CRÉDITOS Y ADMINISTRACIÓN DE CARTERA – BANCA COMUNAL

**Firma Secretaria:**

*Elaborado por: Comercial*

*Fecha de vigencia: 03/01/2023*

## Control de cambios

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<th>Comité de Aprobación</th>
<th>Dirección de Aprobación</th>
<th>Responsable de Embolsamiento / Inmovilización</th>
<th>Modificaciones Revisadas</th>
<th>Motivo</th>
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<td>CC 016-01</td>
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<td>Juan Marcelo Quiles – Comercial</td>
<td>12.3.1 Monto de Préstamo, Plazo y Liquidación, Ampliación de un monto a un tope a 8x20.000, Adjuntos de Sito y depósito con respectivas intercambios y plazas. Disminución del importe mínimo a 5x5.000 para cuentas de trabajo. 12.5.2 Aprobación. Modificación del Nivel Gerencia/Encargado de Surtido y Encargado de Créditos de Surtido con importe mayor a 8x30.000, eliminación del último pago. 17.3.1 Beneficios, Tasa de interés. Disminución de la tasa a un (1) punto respecto al tarifado. 22.1 Flexibilización de requisitos y/o condiciones crediticia para operaciones activas con cuentas distintas hasta el 31/12/2023. Ampliación de aplicaciones de flexibilizaciones a clientes que pagaron ciento cincuenta interbancarias hasta 31/12/2023 y Bancos Comunales que previeron marzo hasta 31/12/2023.*</td>
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*Elaborado por: Comercial*

*Fecha de vigencia: 03/06/2023*
Overview of Sartawi Contract - II

REG-COM-002
REGULATION OF CREDITS AND ADMINISTRATION OF BRIEFCASE – BANKING COMMUNAL
Overview of Sartawi Contract - III

12.3.3 Use of credit

The credits granted through Community Banking will be intended to increase the working capital.

The credit operations granted with Community Banking technology will be recorded with the Economic Activity and Credit Purpose Code (CAEDEC) 65920 "Other Credit Services," both for economic activity and for the credit purpose.

If Sembrar Sartawi IFD verifies that the funds have been diverted to third parties, violating one of the basic principles, which is indivisibility, the associate will be withdrawn from the Community Banking, the loan term will be deemed expired, and the outstanding balance could be immediately due, without prejudice to any other liabilities that the borrower may have incurred.

12.3.4 Interest rates: nominal and penalty

The nominal interest rate will be charged on the outstanding capital balance according to the current tariff.

The penalty Interest is an additional interest rate to the nominal one, which will be charged when the credit becomes overdue.

12.3.5 Guarantees

In addition to the joint, several, and indivisible guarantee presented by the Community Banking, the "Resources of the Common Fund" are also established as a self-liquidating guarantee.
1. Joint-liability structure + observational loan data from Sartawi to parameterize the experimental game

2. Characterize the incentivized lead-borrower(s)’ contract terms

3. Conduct the lab-in-the-field experiment

4. Test the impact of asymmetric loans relative to symmetric loans: monitoring, investment choice, repayment, and economic performance (individuals and MFI)
RCT Design

- Utilize the theoretical foundation to propose how asymmetries and lead-borrower terms can be built into the existing joint-liability contracts.

- Based on the structural lab-in-the-field results.
How to implement contractual asymmetry (i.e., addressing discrimination concerns)?

1. Alternate lead-borrower over different loan cycles (deterministically)

2. Equalize expected returns in one-shot loan case: keeps (m,m) as the unique equilibrium - but comes in expense of MFI profits (sub-optimal)
Assign groups into asymmetric and symmetric contract treatments in order to evaluate the performance of asymmetric contracting.

As part of sub-treatments, add e.g. dynamic (repeated vs. non-repeated borrowing) interaction to understand the confounding role of this channel for the performance of asymmetric contracts.
Among outcome effects to be captured:

1. Repayment likelihood

2. MFI profits / operational gains

3. Demand for asymmetric group loans (from borrowers), and borrower characteristics that relate to asymmetric contracts

- Inform MFIs and policy makers in developing countries about the outcome effects of asymmetric group-loan contracts
Thank You!