The Impacts of Microfinance: A Randomized Evaluation of Spandana’s program in Hyderabad

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The Question

• The most visible anti-poverty innovation in past 20 years

• “There is mounting evidence that the availability of financial services for poor households - microfinance - can help achieve the MDGs.” – CGAP

• “Evidence for”
  – reduction in poverty & hunger
  – universal primary education
  – promotion of gender equality & empowerment of women
  – reduction of child mortality
  – improvement in maternal health

• “In twenty five years of academic and consulting work in local economic development, my experience has been that the microfinance programs often spell the death of the local economy.” Microfinance critic in FT
Why do we need an evaluation?

Microfinance supporters: people are borrowing and we are making money

No evaluation of apple-sellers. Why us?

Two answers:
1. Microfinance is often subsidized, example: India
2. Self-control problems: loans can be tempting → debt trap
Why do we need a randomized evaluation?

• Cannot compare recipients with non-recipients
  – MFIs target the poor
  – More enterprising (or more short-sighted) might self-select

• Cannot compare recipients before and after
  – these are potentially enterprising people

• Cannot compare trends for microfinance recipients and non-recipients
  – Morduch does this and finds a negative impact of Grameen Bank
What do we already know?

- Much experimental work on how to make microfinance work better:
  - Group vs. individual liability (Giné and Karlan 2006)
  - Contract structure (Fischer 2008)
  - Repayment frequency (Field and Pande 2008)
- Non-experimental evidence on the intensive margin impact of microfinance (Kaboski and Townsend 2008)
- No randomized evaluations of the impact of microcredit
- This study: answer some of the basic questions
  - business creation
  - durable goods purchase
  - consumption smoothing
  - etc.
Outline

1. **Overview** of Spandana program and survey
2. What was the **take up** of microcredit?
3. What impacts of microcredit should we **expect**?
4. Impact **results**
   - Average impact of the program
   - Different impacts for different groups?
   - The impact of borrowing
5. **Conclusion**
1. OVERVIEW

- Traditional microcredit program
  - Group liability
  - Weekly or monthly repayment
  - Starting loan is Rs. 10,000 (~$250)
  - Interest rate changed over the period but was around 12% per year (nondeclining balance; ~24% APR)
  - A few individual-liability loans were also given

- Spandana was already a large MFI in South India
- Not previously operating in Hyderabad.
- Agreed to randomly phase in operations in Hyderabad.
Data collection

• Baseline survey: 2005
  – 20 or 40 households per slum; 2,800 total
  – Intentionally did not do a panel (i.e. resurvey in the endline)

• Census: 2006-7: sample frame for endline

• Endline survey: 2007-8
  – 15-24 months after loan disbursement started in a slum
  – Spandana borrowers were oversampled; we adjust for this in all results
Endline sample

- 104 slums: 52 treatment, 52 control
- ~7,200 households total
- Households with the following characteristics were surveyed (more likely to become microfinance clients):
  - At least one woman aged 18-55
  - Household has lived in the slum at least 3 years
  - Not rated as someone Spandana wouldn’t lend to
- Measures impact for households with these characteristics
  - results for other types of households could be different
Outcomes

• Baseline and endline surveys:
  – Household debt
  – Consumption
  – Durable purchases
    • businesses
    • household
  – Business activities and profits
  – Decision-making (“empowerment”)
  – Education, health, etc.
Households at baseline

- Family of 5
- Monthly expenditure of ~Rs 5,000 (~$125)
- 98% of 7-11 year olds, 84% of 12-15 year olds in school
- Borrowing (from friends, moneylenders, etc.) is common (69% of households); average interest rate 3.85% per month
- Almost no MFI borrowing.
Entrepreneurship at baseline

• 31% of the households run at least one small business (vs. OECD average of 12%)
  – Of these, 9% of households run more than one business

• But these businesses had few…
  – Specialized skills (mostly general stores, tailors, fruit/vegetable vendors)
  – Employees:
    • Only 10% have any employees; none has more than 3
  – Assets
    • 20% use no productive assets whatsoever.

• Scale of businesses:
  – Sales: Rs 13,000 (~$325) per month
  – Profits: Rs 3,040 (~$75) per month
Millions of Entrepreneurs...
Treatment-Control Balance: Slum Level

Population
- Treatment: 300.3
- Control: 316.6

Debt (Rs.)
- Treatment: 45,538
- Control: 50,430

Business per capita
- Treatment: 28.5%
- Control: 29.9%

Expenditure per capita (Rs. / month)
- Treatment: 1,006
- Control: 981

Literacy
- Treatment: 68.2%
- Control: 68.0%

No differences are statistically significantly different.
No differences are statistically significantly different
Why do you want a loan?

- Repay old loan: 30%
- Start business: 30%
- Capital for existing business: 20%
- Household consumption: 15%
- Household durable: 15%
- Ceremony: 10%
- Education: 5%
- Crisis: 5%
- Health shock: 5%
(Control) households at endline

- The average household is a family of 6 (4.7 adu)
- Monthly expenditure of Rs 6,375 (~$160)
- 96% of the 7-11 year olds, and 85% of the 12-15 year olds in school
- Borrowing is very common (89% of households) – average interest rate ~2% per month
- 18.7% have an MFI loan
What should we expect

• Assume:
  – fixed cost of starting a business
  – variable cost of running it

• When credit access increases:
  – Those without an existing business decide
    • Some will start a business (richer, lower opportunity cost, those with better ideas)
      – Starting a business might involve cutting consumption
    • The rest will just finance consumption
  – Existing business owners don’t face a fixed cost: borrow to increase consumption and variable capital
    • Their profits should go up

• Overall consumption may go up or down
2. TAKE UP?

Spandana loan

- Treat: 18.6%
- Control: 5.3%

Any MFI loan

- Treat: 26.9%
- Control: 18.6%
Impact on borrowing

- **8.3** percentage points more MFI borrowers (Spandana or other) in treatment slums
  - **13.3** percentage points more Spandana borrowers

- Average of Rs. **1,260** of additional MFI borrowing per household in treatment slums (ITT estimate)

- These relatively low rates of MFI loan takeup are similar to those found in other J-PAL projects.
Impact on business

New business **

For those starting a business:

Profits **

Revenues

0% 5% 10% 15% 20% 25%

6,514 1,704

21,610 14,710

** For those starting a business:
Impact on expenditure

PCE

1,457
1,419

Durable PCE *

138
116

Business durables *

12.1
5.3

Temptation goods *

74.9
83.9
Child welfare and women’s “empowerment”

- **Woman's spending decision**: 93.0% and 93.0%
- **Kids in school**: 1.39 and 1.42
- **Health expenditure**: 138 and 140
- **Child's major illness**: 24.0% and 24.1%
Predicting who is a likely entrepreneur

- Own land in Hyderabad: 7.5%
- Spouse is literate: 7.5%
- Number of prime age women: 7.5%
- Own land in village: 5.0%
- Spouse works for wage: 2.5%
Expenditure of groups, by business status

Table 5: Expenditure for control households, by business status

<table>
<thead>
<tr>
<th>Did not have a business 1 yr ago</th>
<th>Old business owners (1)</th>
<th>High-business propensity (2)</th>
<th>Low-business propensity (3)</th>
<th>P value: (1)=(3)</th>
<th>P value: (2)=(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total PCE (Rs/mo)</td>
<td>1,479.56</td>
<td>1,430.31</td>
<td>1,347.56</td>
<td>0.014</td>
<td>0.011</td>
</tr>
<tr>
<td>Nondurable PCE (Rs/mo)</td>
<td>1,335.57</td>
<td>1,336.81</td>
<td>1,237.32</td>
<td>0.006</td>
<td>0.051</td>
</tr>
<tr>
<td>Number of control HHs</td>
<td>979</td>
<td>2,571</td>
<td>1,525</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: P-values computed using cluster-robust standard errors. Old business owners are those who own a business started at least 1 year before the survey. High-business propensity households are those who did not have a business 1 year before the survey.
Borrow from any MFI?

- New business propensity (treat): 16.9%
- New business propensity (control): 18.2%
- Any old business (treat): 39.3%
- Any old business (control): 30.8%
- No old business (treat): 28.3%
- No old business (control): 18.7%
Start a new business

- New business propensity (treat): 14.0%
- New business propensity (control): 9.2%
- Any old business (treat): 9.8%
- Any old business (control): 8.7%
- No old business (treat): 2.6%
- No old business (control): 5.3%
Durable expenditure

- New business propensity (treat): 192
- New business propensity (control): 137
- Any old business (treat): 235
- Any old business (control): 180
- No old business (treat): 80
- No old business (control): 116

** Asterisk indicates statistical significance.
Non durable expenditure

- New business propensity (treat): 1,329
- New business propensity (control): 1,587
- Any old business (treat): 1,639
- Any old business (control): 1,574
- No old business (treat): 1,517
- No old business (control): 1,305
Temptation
**Temptation goods**

- **New business propensity (treat):** 29
- **New business propensity (control):** 69
- **Any old business (treat):** 68
- **Any old business (control):** 82
- **No old business (treat):** 111
- **No old business (control):** 85
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Borrows from any MFI</td>
<td>Started new business</td>
<td>Durable expenditure</td>
<td>Nondurable expenditure</td>
<td>&quot;Temptation goods&quot;</td>
</tr>
<tr>
<td><strong>Main effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New biz propensity (no old biz)</td>
<td>-0.0053004</td>
<td>0.039</td>
<td>20.71</td>
<td>282.37***</td>
<td>-15.83**</td>
</tr>
<tr>
<td></td>
<td>[0.0338]</td>
<td>[.0189]</td>
<td>[18.68]</td>
<td>[61.54]</td>
<td>[7.73]</td>
</tr>
<tr>
<td>Any old biz</td>
<td>0.121***</td>
<td>0.034</td>
<td>63.52</td>
<td>269.33***</td>
<td>-3.22</td>
</tr>
<tr>
<td></td>
<td>[0.0377]</td>
<td>[.0147]**</td>
<td>[17.77]***</td>
<td>[57.12]</td>
<td>[8.26]</td>
</tr>
<tr>
<td><strong>Interaction with treatment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any old biz</td>
<td>0.085*</td>
<td>0.011</td>
<td>55.42**</td>
<td>65.12</td>
<td>-13.4</td>
</tr>
<tr>
<td></td>
<td>[0.0464]</td>
<td>[.012]</td>
<td>[26.18]</td>
<td>[49.09]</td>
<td>[8.75]</td>
</tr>
<tr>
<td>No old biz</td>
<td>0.0959**</td>
<td>-0.027</td>
<td>-36.32</td>
<td>212.41**</td>
<td>25.56**</td>
</tr>
<tr>
<td></td>
<td>[0.0465]</td>
<td>[.020]</td>
<td>[23.25]</td>
<td>[100.52]</td>
<td>[11.39]</td>
</tr>
<tr>
<td>New biz propensity</td>
<td>-0.0176</td>
<td>0.048**</td>
<td>54.93**</td>
<td>-258.49**</td>
<td>-39.85***</td>
</tr>
<tr>
<td></td>
<td>[0.0473]</td>
<td>[.024]</td>
<td>[29.50]</td>
<td>[102.22]</td>
<td>[12.98]</td>
</tr>
<tr>
<td><strong>Control mean of LHS var</strong></td>
<td>0.187</td>
<td>0.053</td>
<td>116.174</td>
<td>1,304.79</td>
<td>85.079</td>
</tr>
<tr>
<td><strong>Control Std Dev</strong></td>
<td>0.39</td>
<td>0.25</td>
<td>332.563</td>
<td>852.40</td>
<td>130.751</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>5991</td>
<td>6733</td>
<td>6136</td>
<td>6136</td>
<td>6100</td>
</tr>
</tbody>
</table>

Note: New business propensity estimated using spouse's literacy, spouse working for a wage, number of prime-aged women, and land ownership (HHs with missing predictors dropped). New business propensity scaled to equal one at 75th percentile. "Temptation goods"
<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>95th quantile regression</th>
<th>Median regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Profits</td>
<td>Drop businesses with zero inputs or zero income</td>
<td>Drop businesses with inputs&gt;10x biz income, or inputs&lt;.10x biz income</td>
<td>Drop businesses with inputs&gt;10x biz income, or inputs&lt;.10x biz income</td>
</tr>
<tr>
<td>Treatment effect</td>
<td>5,386.906**</td>
<td>3,059.243**</td>
<td>2,783.215**</td>
</tr>
<tr>
<td></td>
<td>[2,248.648]</td>
<td>[1,501.998]</td>
<td>[1,401.219]</td>
</tr>
<tr>
<td>Control mean for existing businesses</td>
<td>776.161</td>
<td>1,947.90</td>
<td>1,660.74</td>
</tr>
<tr>
<td>Control Std Dev</td>
<td>56,960.961</td>
<td>26,426.04</td>
<td>27,476.15</td>
</tr>
<tr>
<td>N</td>
<td>2014</td>
<td>1821</td>
<td>1568</td>
</tr>
</tbody>
</table>

Note: Existing businesses are those started at least 1 year prior to the survey. Cluster-robust standard errors in brackets bootstrapped to account for generated regressor; regressions weighted to account for oversampling of Spandana borrowers. * means sta
Results by business status

• Old business owners borrow at (relatively) high rates, invest in durable goods and see increased business profits.

• Among those who didn’t have a business 1 year ago:
  – Those with high propensity (literate, non-wage-working spouse) borrow and *reduce* nondurable consumption
  – Those with low propensity (illiterate and/or wage-working spouse) borrow and *increase* nondurable consumption
The impact of borrowing (TOT)

• If there are no GE/spillover effects of Spandana’s expansion, treatment is a valid instrument for borrowing from Spandana.

• IV effects will be an
  – over-estimate if the presence of Spandana also induced some who did not take a loan to start or expand a business (for example, due to social learning)
  – under-estimate if the presence of Spandana discouraged some who did not take a loan to start or expand a business (for example, due to competition)
## Impacts of borrowing on borrowers

<table>
<thead>
<tr>
<th></th>
<th>New business</th>
<th>Durables</th>
<th>Durables used in a business</th>
<th>Nondurable PCE</th>
<th>&quot;Temptation goods&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spandana borrower</td>
<td>0.130**</td>
<td>126.141</td>
<td>43.612</td>
<td>-77.076</td>
<td>-66.360*</td>
</tr>
<tr>
<td></td>
<td>[0.058]</td>
<td>[86.129]</td>
<td>[26.833]</td>
<td>[225.890]</td>
<td>[36.511]</td>
</tr>
<tr>
<td>Control Mean</td>
<td>0.071</td>
<td>138.554</td>
<td>12.085</td>
<td>1318.585</td>
<td>75.158</td>
</tr>
<tr>
<td>Control Std Dev</td>
<td>0.314</td>
<td>482.692</td>
<td>174.368</td>
<td>1054.137</td>
<td>125.905</td>
</tr>
<tr>
<td>N</td>
<td>6555</td>
<td>6570</td>
<td>6611</td>
<td>6570</td>
<td>6651</td>
</tr>
</tbody>
</table>

Note: Spandana borrowing instrumented with living in a treated slum. Cluster-robust standard errors in brackets.
Conclusions

• Takeup of MFI loans is lower than is often predicted
  – This matters for planning sample sizes
  – It also suggests microcredit is not for everyone

• Microcredit does have impacts, and they differ for different households:
  – 1 in 8 new borrowers start a new business
  – Those who already had businesses invest in durables and restrict their “temptation” consumption; their profits go up
  – Others consume more

• Microcredit may neither be the life changing experience that some have described, nor the new usury: the bottom line is that not everyone may want to become an entrepreneur.
Testing for spillovers

• Does living in a treated slum only affect its residents if they borrow?
• If so, the coefficients in the first stage and reduced form should be proportional.
• To test this, need a group with a differential first stage, e.g. old business owners. Estimate:
  \[ MFI_i = \pi_1 + \pi_2 \text{Treat}_i + \pi_3 \text{OldBiz} \times \text{Treat}_i \]
  \[ \text{Exp}_i = \theta_1 + \theta_2 \text{Treat}_i + \theta_3 \text{OldBiz} \times \text{Treat}_i \]
• No spillovers \[ \rightarrow \theta_2 / \pi_2 = \theta_3 / \pi_3 \]
Table A: Testing for spillovers

<table>
<thead>
<tr>
<th></th>
<th>Spandana</th>
<th>Nondurables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New biz propensity (no old biz)</td>
<td>-0.048*</td>
<td>334.729***</td>
</tr>
<tr>
<td></td>
<td>[0.025]</td>
<td>[77.959]</td>
</tr>
<tr>
<td>Any old biz</td>
<td>-0.006</td>
<td>334.652***</td>
</tr>
<tr>
<td></td>
<td>[0.024]</td>
<td>[64.141]</td>
</tr>
<tr>
<td><strong>Interaction with treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No old biz</td>
<td>0.114**</td>
<td>174.134</td>
</tr>
<tr>
<td></td>
<td>[0.045]</td>
<td>[110.349]</td>
</tr>
<tr>
<td>New biz propensity</td>
<td>-0.003</td>
<td>-234.064*</td>
</tr>
<tr>
<td></td>
<td>[0.042]</td>
<td>[120.672]</td>
</tr>
<tr>
<td>Any old biz</td>
<td>0.193***</td>
<td>37.848</td>
</tr>
<tr>
<td></td>
<td>[0.034]</td>
<td>[50.690]</td>
</tr>
<tr>
<td><strong>Chi-square stat</strong></td>
<td></td>
<td>1.359</td>
</tr>
<tr>
<td><strong>p value</strong></td>
<td></td>
<td>0.244</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>6415</td>
<td>6567</td>
</tr>
</tbody>
</table>

Note: Cluster-robust standard errors in brackets DO NOT account for generated regressor.