The Impact of Seasonal Food and Cash Loans on Smallholder Farmers in Zambia

Günther Fink (Harvard SPH)
Kelsey Jack (Tufts University)
Felix Masiye (UNZA)

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UNZA School of Veterinary Science
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Project Background

- Small scale farming remains the primary income source in many developing countries.
- In Zambia more than 60 percent of households are engaged in agriculture.
- Most with farms are small (<5 hectares) and farming income is limited (< K 1000 per hectare).
- Most farming households live substantially below the poverty line.
Seasonal Constraints

• Main crops generally become available around April

• By September, some households start to run out of food and cash reserves

• By January, a majority of households struggles to cover basic consumption needs (peak “hungry season” begins)
Seasonal Food Shortage

Share of households reporting food shortages

- September
- October
- November
- December
- January
- February
- March
- April
- May
- June
How Do Households Do When They Run out of Food Reserves

- Do ganyu: 56.0%
- Borrow money/food: 28.0%
- Use savings: 22.0%
- Sell/trade assets: 17.0%
Ganyu Labor and Poverty

- While ganyu labor is a relatively easy way to get money or food in the short run, it may be costly for farms in the long run
- Time spent on other farms on average implies less time spent on primary farm land
- Less time on farms likely means reduced harvest ➔ more ganyu next year (dynamic poverty cycle)
Study Objectives

To rigorously assess whether..

1. …access to seasonal credit reduces ganyu labor as well as other costly coping strategies

2. …access to seasonal credit can increase agricultural output
Study Overview

• 1 year pilot in 2012/2013

• Main study: November 2013 – September 2015

• Target population: Rural small scale farmers (2-12 acres of land)

• Sample size: 3200 farmers across 175 villages
## Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did ganyu</td>
<td>0.62</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Hired ganyu</td>
<td>0.32</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Acres cultivated</td>
<td>4.53</td>
<td>4</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>HH size</td>
<td>5.33</td>
<td>5</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Female headed</td>
<td>0.25</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Age of hh head</td>
<td>42.84</td>
<td>40</td>
<td>17</td>
<td>93</td>
</tr>
<tr>
<td>Harvest value (USD)</td>
<td>584.76</td>
<td>456</td>
<td>0</td>
<td>8954</td>
</tr>
<tr>
<td>Number of crops</td>
<td>3.01</td>
<td>3</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Livestock value (USD)</td>
<td>686.94</td>
<td>150</td>
<td>0</td>
<td>15000</td>
</tr>
<tr>
<td>Any borrowing</td>
<td>0.14</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Sampled Population: Small scale farmers in 175 villages (N=3200)

Year I

Control group: 58 villages

Control Group: N=38

Maize loan: N=10

Cash loan: N=10

Maize loan: 58 villages

Cash loan: 59 villages

Year II

Maize loan: N=28

Maize loan: N=30

Control: N=29

Cash loan: N=30
Randomization Results

Legend
- Chipata Town Outline
- Group
  - Cash
  - Control
  - Maize
- Chipata District

Map showing the distribution of different groups across the Chipata District.
Seasonal Loan Interventions

Cash loan
- Receive: 200 Kwacha in January
- Pay back: 260 Kwacha or 4 x 50 kg bags of maize in June/July

Food loan
- Receive: 3 x 50 kg bags of maize in January
- Pay back: 260 Kwacha or 4 x 50 kg bags of maize in June/July
Intervention Timing

![Bar chart showing intervention timing for planting and weeding phases with loan intervention and repayment periods.]
Results 1: Uptake and Repayment

Year 1 | Year 2
--- | ---
Take up: 98.5% | 97.1%
Repayment: 95.0% | 79.5%
Results 2: Impact on Food Security

<table>
<thead>
<tr>
<th></th>
<th>Worry about food</th>
<th>No food in household</th>
<th>Sleep hungry</th>
<th>Went 24 hours without eating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any loan treatment</td>
<td>-0.129***</td>
<td>-0.106***</td>
<td>-0.108***</td>
<td>-0.048***</td>
</tr>
<tr>
<td></td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.021)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>Observations</td>
<td>2775</td>
<td>2776</td>
<td>2775</td>
<td>2776</td>
</tr>
<tr>
<td>Control group mean</td>
<td>0.679</td>
<td>0.269</td>
<td>0.261</td>
<td>0.127</td>
</tr>
</tbody>
</table>

- 19% reduction in food concerns
- 39% reduction in food scarcity in household
- 39% reduction in sleeping hungry
Results 3: Impact on Labor

<table>
<thead>
<tr>
<th>Any loan treatment</th>
<th>Any ganyu sold</th>
<th>Ganyu hours per week</th>
<th>Any ganyu hired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any loan treatment</td>
<td>-0.027**</td>
<td>-1.139***</td>
<td>0.051***</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.325)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>Baseline mean</td>
<td>0.609</td>
<td>3.417</td>
<td>0.321</td>
</tr>
<tr>
<td>Observations</td>
<td>6012</td>
<td>5799</td>
<td>6032</td>
</tr>
</tbody>
</table>

- 5% reduction in doing ganyu
- 33% reduction in hours ganyu
- 15% increase in hiring ganyu
### Results 4: Impact on Borrowing

<table>
<thead>
<tr>
<th></th>
<th>Formal loan</th>
<th>Informal loan (kaloba)</th>
<th>Sold asset</th>
<th>Sold livestock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any loan treatment</td>
<td>-0.012</td>
<td>-0.019***</td>
<td>-0.001</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.005)</td>
<td>(0.008)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>Baseline mean</td>
<td>0.440</td>
<td>0.070</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Observations</td>
<td>6030</td>
<td>6033</td>
<td>6032</td>
<td>6033</td>
</tr>
</tbody>
</table>

- 32% reduction in high interest rate loans
- No impact on formal loans or assets
Results 5: Impact on Self-Rated Health

<table>
<thead>
<tr>
<th></th>
<th>Overall health</th>
<th>Walk 5k</th>
<th>Carry 50kg</th>
<th>Carry water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any loan treatment</td>
<td>0.076***</td>
<td>0.023*</td>
<td>0.030**</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.013)</td>
<td>(0.013)</td>
<td>(0.012)</td>
</tr>
<tr>
<td>Control group mean</td>
<td>3.1</td>
<td>0.70</td>
<td>0.60</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Statistically significant but small increases in self-assessed health and fitness (reported in harvest season)
## Results 6: Agricultural Output

<table>
<thead>
<tr>
<th></th>
<th>Acres harvested</th>
<th>Quantity harvested</th>
<th>Value (constant prices)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any loan treatment</td>
<td>0.155**</td>
<td>106.6**</td>
<td>202.1**</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(50.5)</td>
<td>(93.4)</td>
</tr>
<tr>
<td>Observations</td>
<td>9171</td>
<td>9172</td>
<td>9172</td>
</tr>
<tr>
<td>Year 1 control group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>4.4</td>
<td>2185</td>
<td>3640</td>
</tr>
</tbody>
</table>

- 3.5% increase in harvest field size
- 106 kg (4.8%) increase in total harvest quantity
- KR 202 (5.5%) increase in harvest value
Other Results

• No impact was found for other agricultural inputs such as seeds for fertilizer – loan amount likely too small to alter these.

• No impact found on height and weight of children or adults; overall improvements in nutrition not sufficient to compensate for seasonal shortages.

• Overall prevalence of undernutrition remains very high in this population; up to 50% among children under-5 in our sample.
Year 1 vs. Year 2 Differences

• Overall, the 2015 (Year 2) harvest was about 15% lower than the 2014 (Year 1) harvest, mostly due to less favorable rainfalls

• Weaker harvests were associated with lower repayment (particularly in areas with repeated programs)

• Weaker harvests were also associated with lower intervention impact on agricultural output
Cash vs. Maize Loans

- No major differences in take up and repayment
- Maize loans appear to have marginally bigger effects on nutrition and food security
- Cash loans have larger impact on
  - labor selling (doing ganyu)
  - labor hiring (hiring ganyu)
  - agricultural output
Cash vs. Maize Loan Implementation

- For the project, all activities were closely coordinated with local headmen/women, who supported collection.

- Net loan returns was positive (IR 30% requires 77% repayment).

- Implementation cost for our project was substantial:
  - ~ K 1800 per village for cash.
  - ~ K 4000 per village for maize (maize is bulky!).
    - very large compared to loan volume handled (20*200).

  ➔ More effective delivery platforms would be needed for larger programs.
Summary and Conclusions

• Rural farmers face substantial seasonal resource shortages, which result in inefficient labor allocation and output losses

• Seasonal loan programs can reduce constraints, reduce hunger and increase wellbeing

• The loan program tested worked well overall, but is relatively costly from an implementation perspective

• Alternative delivery options as well as saving mechanisms should be considered and evaluated