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

Research Methods and Results

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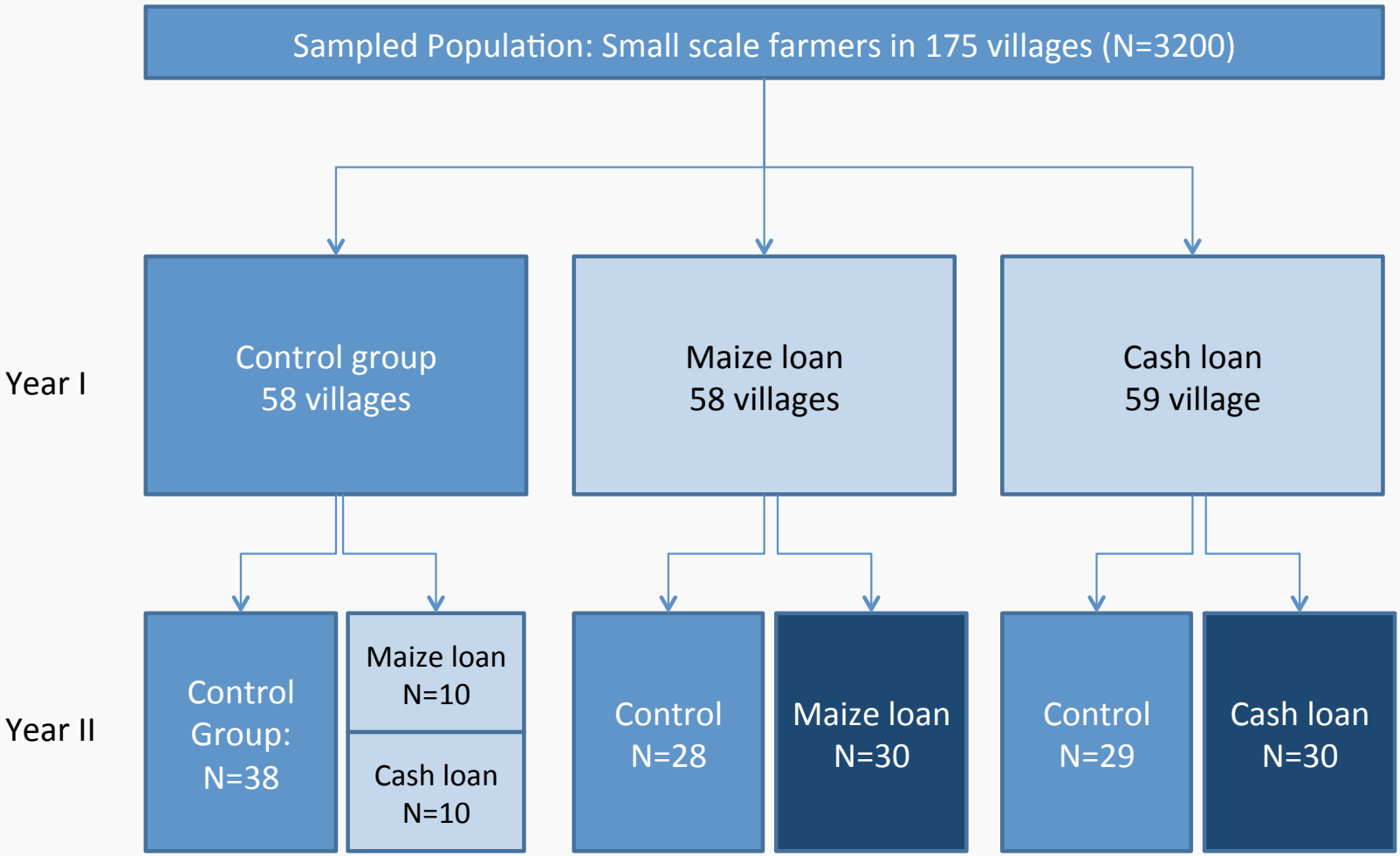
Key Objectives

- Introductions
- Research design revisited
- Data collection
- Additional findings
- Discussion throughout!

Research design: Overview



Research design: Treatment arms

Two treatment arms:

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

2. 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

Research design: Designing comparable loan treatment arms

- How do these loans compare?
  - value in January: maize more valuable
  - value in June: repay maize cheaper
  - other considerations: transaction costs
- Choice experiments
  - suggest indifference between the two loan types at the value offered
- Income effect control: sub-sample of control villages received a 60 Kwacha gift

Research design: Additional sub-treatments

Additional “cross cutting” treatments in year 2 only

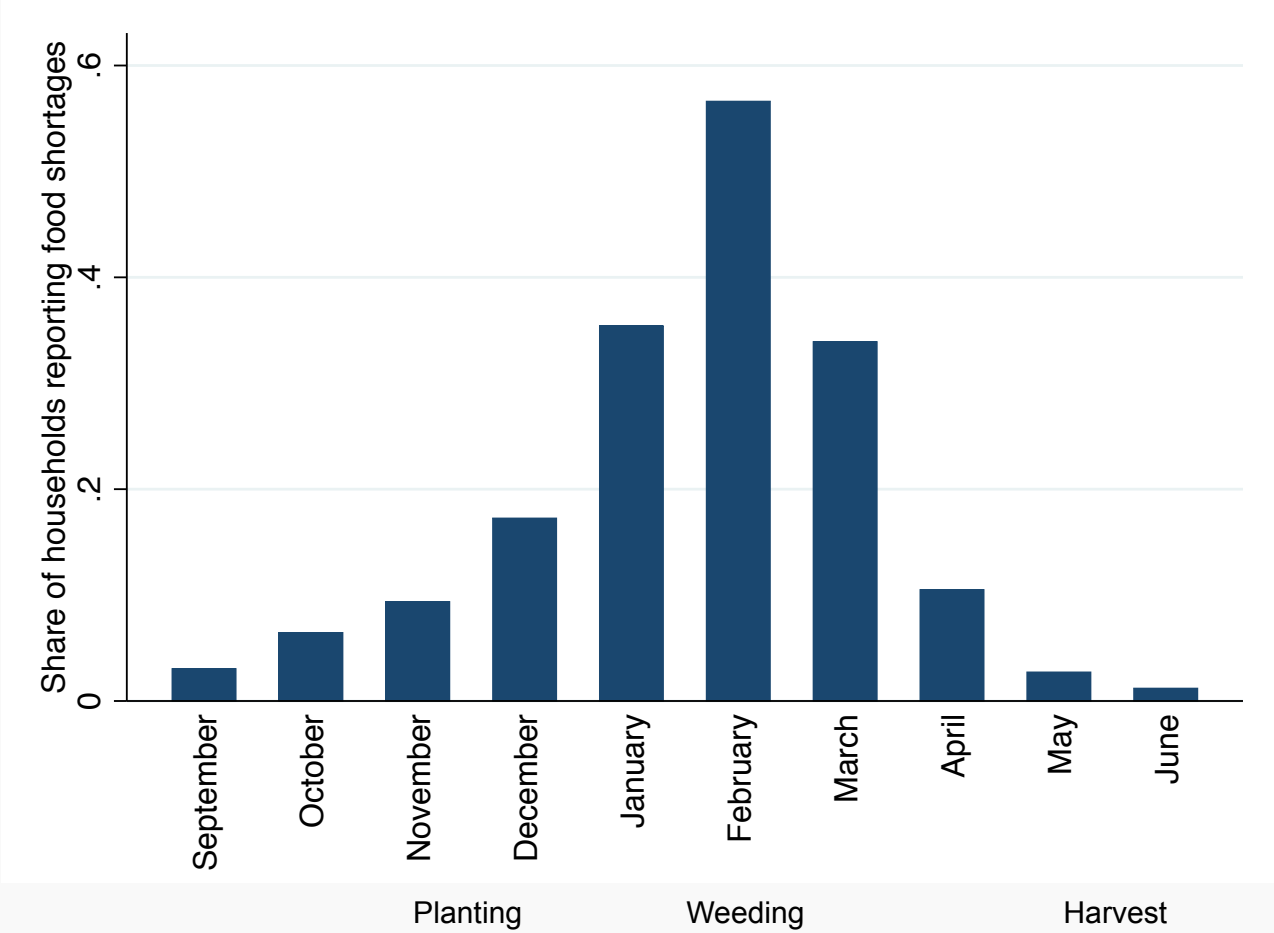
1. Early announcement

   Half of the treated villages in year 2 were informed about the loan in September; other half had year 1 timing (January)

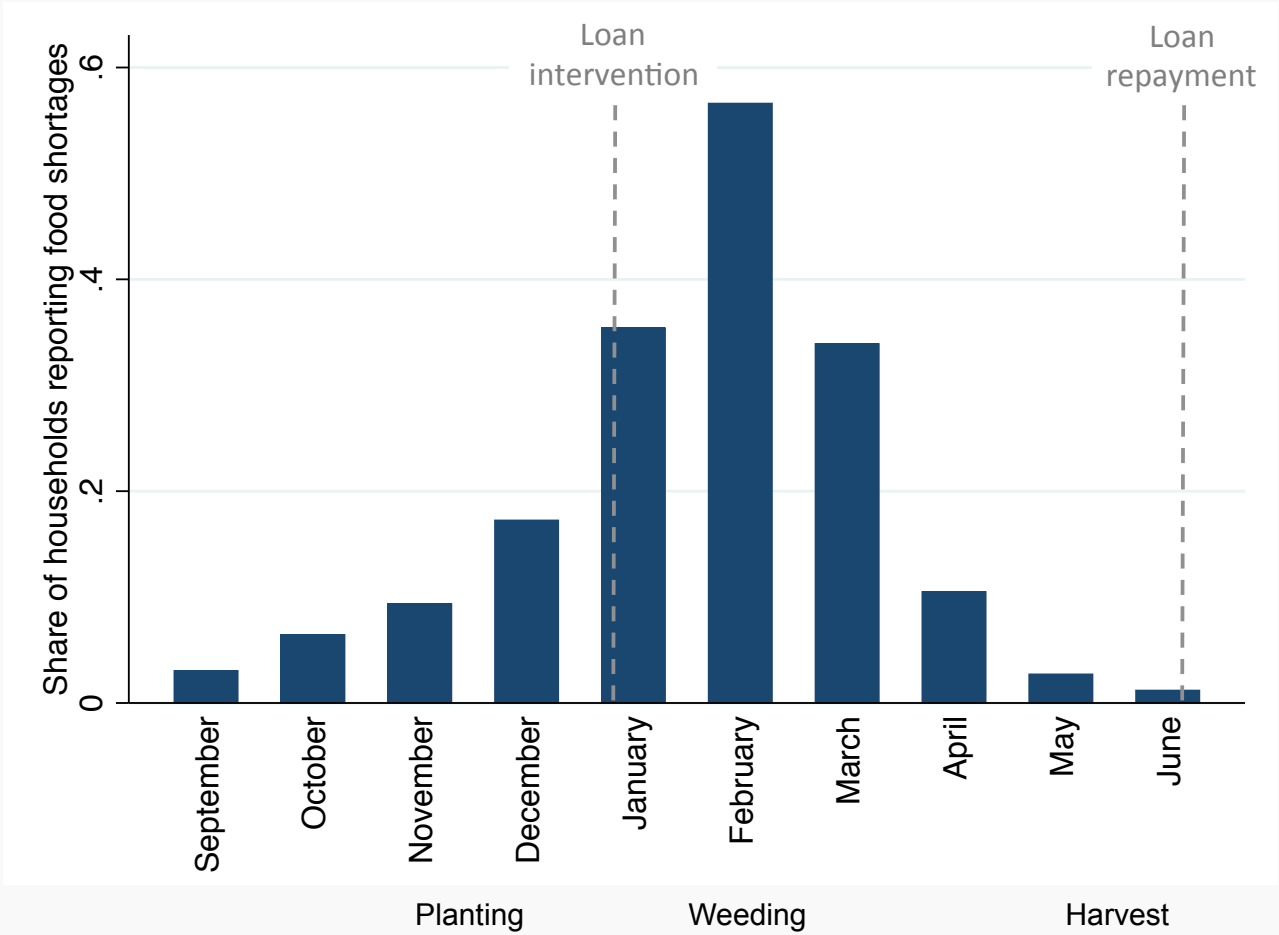
2. Cash-only repayment

   Half of the treated villages in year 2 were required to repay in cash (informed of this before take up)

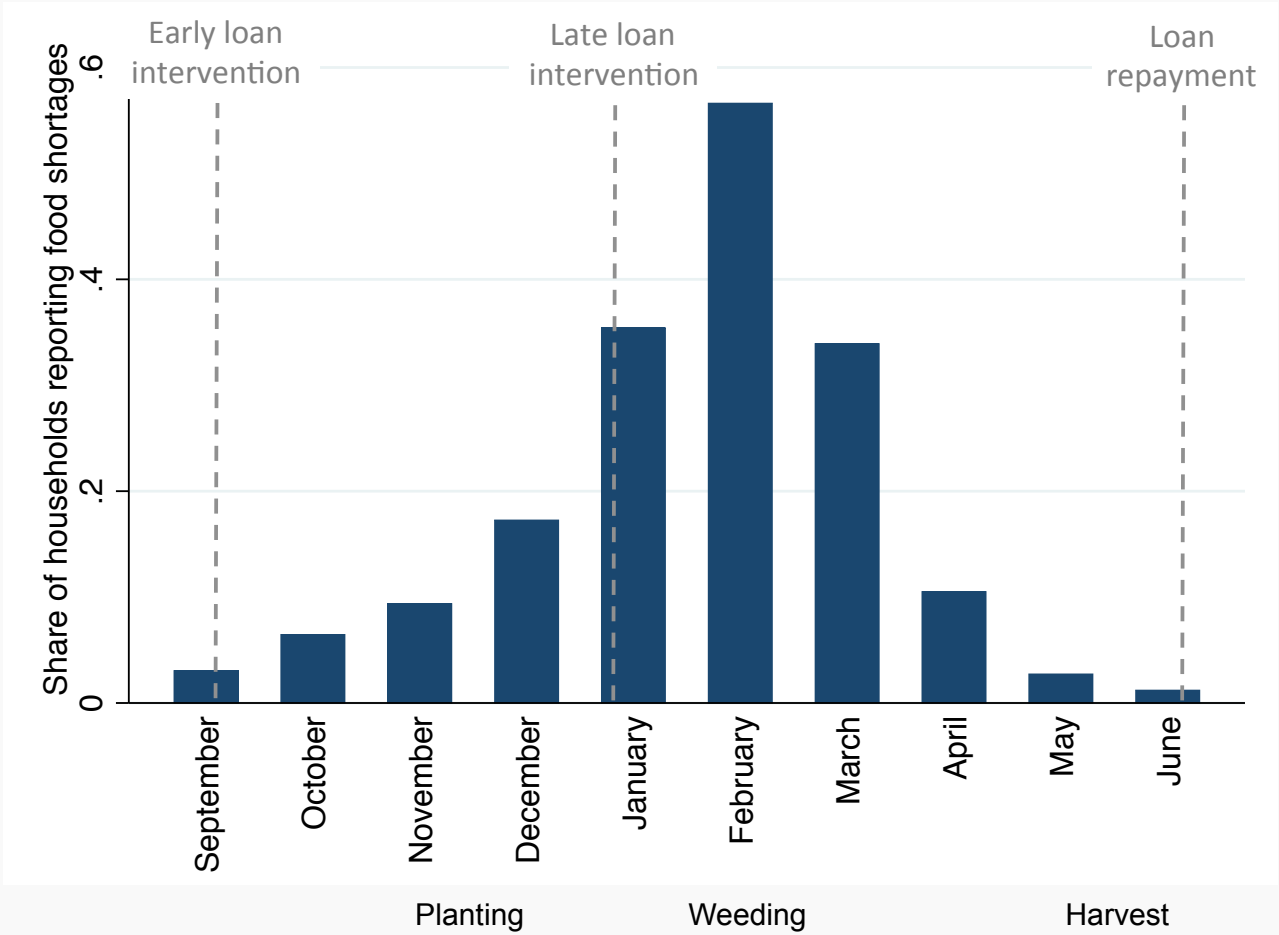
Research design: Timing



Research design: Timing, Year 1



Research design: Timing, Year 2



Randomization: why and how

- Impact evaluation is difficult!
  - Farmers who join a program are different from those who do not
  - Conditions change over time

- Random assignment ensures that treatment and control group are – *but for the intervention* – statistically the same
  - With a large enough sample, compare outcomes and learn the *causal impact* of the programme

Randomization check

- Compare farmer and village characteristics by treatment
  - Randomization implies that observable characteristics are balanced
  - Assume unobservable characteristics are also balanced

Randomization implementation

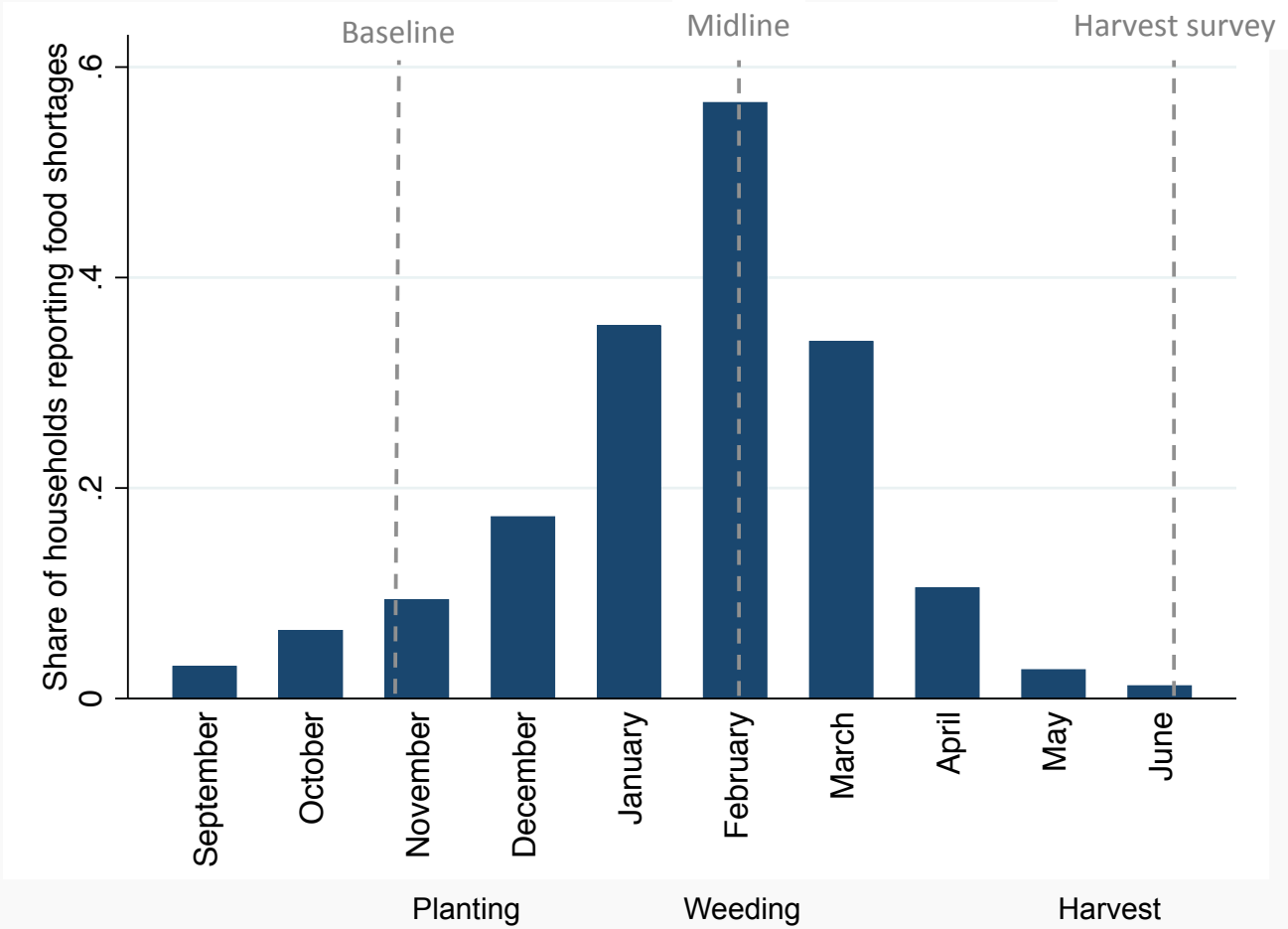
Year 1: Randomly assigned villages to control, cash and maize loans, checking for balance on variables measured at baseline

Year 2: Re-assign main treatments, rotating between treatment and control, balancing again on baseline variables + year 1 treatments and year 1 harvest output

Sub-treatments: Cross-randomize sub-treatments, balancing on baseline variables + main treatments in both years

Do all of this via computer code (Stata do-file), using baseline data as an input

Data collection: Timing, Year 1



Data collection: Survey rounds

- **Baseline survey** (N=3141): Pre-planting survey (Oct-Nov) of all eligible households
- **Harvest survey** (N=3031): Harvest season (July-Aug 2014) survey of all eligible households
- **Endline survey** (N=3005): Harvest season (July-Aug 2015) survey of all eligible households
- **Midline survey** (N=1193): Hungry season (Feb-Mar) survey of a random 1/3 sample of households
- **Labor survey** Rotating sample (Mar 2014-Aug 2015); ~14 households/day
- **Employer survey** Rotating sample (Mar 2014-Aug 2015); ~10 employers/week

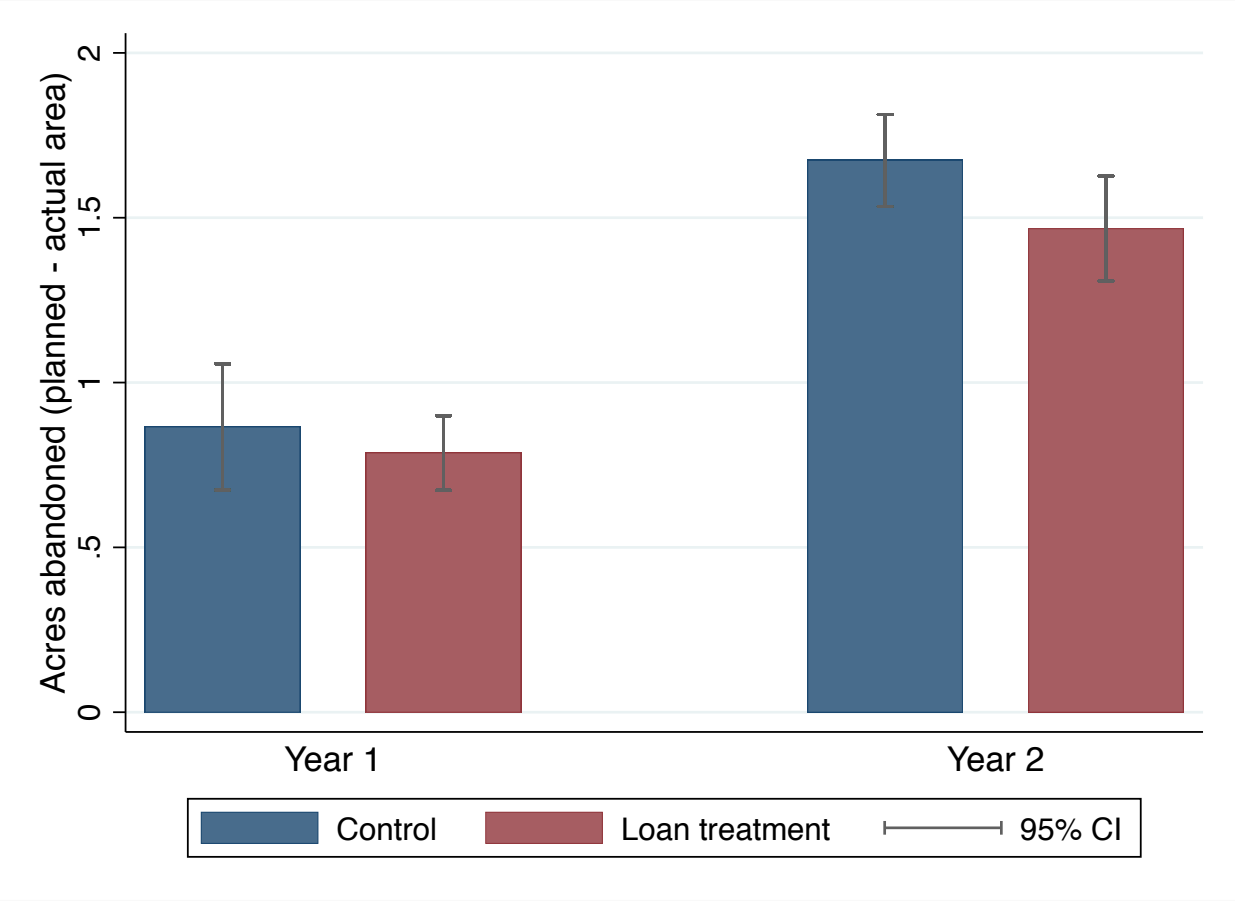
Data collection: Survey sampling

- Main surveys: Baseline, Harvest and Endline surveys censused all households
- Midline survey and Labor survey round 3 randomly sampled 7 households from all villages during lean season
- Other labor survey rounds also randomly sampled 7 households per village but with incomplete coverage

Data collection: Survey procedures

- Data collection via smartphone
  - Program survey into handheld device
  - Allows for
    - Real time data checking
    - Prepopulation of fields based on earlier survey rounds (e.g. household roster)
    - Population of later fields based responses earlier in same survey
    - Data collection to detect cheating (timestamps, GPS coordinates)

Results: Additional findings



Output effect driven partly by farmers cultivating less area than planned

- An effect that is decreased by the loan treatment

Results: Additional findings

Daily wage:	Individual	Village median
Any loan treatment	1.990*	2.102*
	(1.098)	(1.150)
By treatment		
Cash	1.920	2.557*
	(1.493)	(1.538)
Maize	2.063	1.628
	(1.282)	(1.341)
Cash loan = maize loan (p-val)	0.200	0.098
Baseline mean	15.621	

Wages increase in treatment villages by around K2 or 12.8%

Results: Additional findings

Sub-treatments:

- Early notification:
  - No significant impact on main outcomes
  - Possibly because it was implemented only in year 2

- Cash-only repayment
  - Similar uptake and repayment rates
  - Much more cost-effective

Measurement: Self-reporting bias

- Main outcome measures are collected by survey → self-reported
  - Concern: If treatment households are more inclined to give favorable responses, then result might just be self-reporting bias, not real results
  - Investigating the concern:
    1. Collect data on a "social desirability index" and compare across treatment and control groups
    2. Collect objective agricultural output data and test whether it is better correlated with self-reported outcomes in treatment vs control groups

Measurement: Self-reporting bias

	A. Social desirability bias	
	Labor survey	Endline
Any loan treatment	-0.041	0.041
	(0.143)	(0.099)
Control group mean	21.639	20.578

	B. Self-reported maize yields	
	Year 1	Year 2
Objective measure	0.775**	0.053***
	(0.384)	(0.009)
Any loan treatment	-31.009	19.513
	(123.080)	(60.638)
Loan treatment x Objective measure	0.150	-0.002
	(0.623)	(0.019)
Control group mean	563.367	600.645

Future research questions

1. What are the returns to capital at different points during the agricultural season?
   - Do farmers benefit more if they receive a loan at planting, during the hungry season or at harvest?
   - For relatively small loans, each point during the season has clear up-side

2. What other approaches might effectively smooth seasonal variability?
   - Would savings accounts or better storage be a cheaper and equally effective solution? What about crop diversification?