

Breakout Session B:
In-depth Research Results

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Session agenda

- Research design revisited
- Findings in greater detail
 - Effect of subsidies
 - Effect of incentives
 - Effect of monitoring
 - Results by farmer type
- Discussion throughout!

Reminder: Research design

		Variation in input cost (A) in ZMK			
		A = 0	A = 4000	A = 8000	A = 12000
Reward before take up	Continuous variation in the reward for keeping at least 35 trees alive				
Reward after take up					
		1/5 th receive ongoing monitoring			

Research questions

- Do input subsidies increase adoption of long run technologies?
 - Do they reduce follow through (increase wastage)?
- Do performance incentives lead to greater adoption?
 - Do they increase effort or attract high-risk farmers?
- What explains low adoption of agroforestry?
 - Are farmers more sensitive to short run costs or delayed benefits?

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 implementation

- Input cost treatments
 - Randomized at farmer group level using computer program to balance characteristics
- Incentive treatments
 - Randomized at individual level using simple lottery
 - Scratch card used to make process transparent
- Surprise reward treatment
 - Randomized at individual level based on registration time

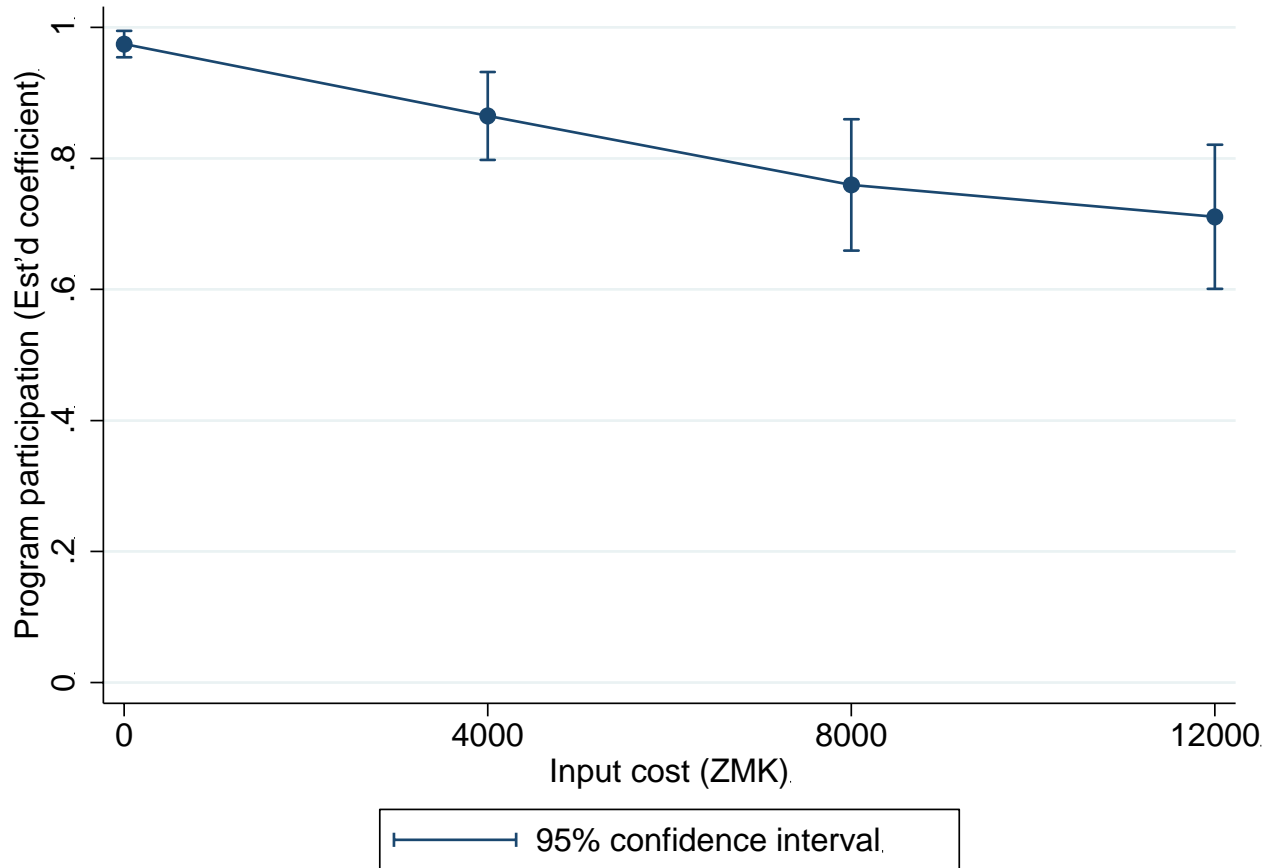
Randomization check

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

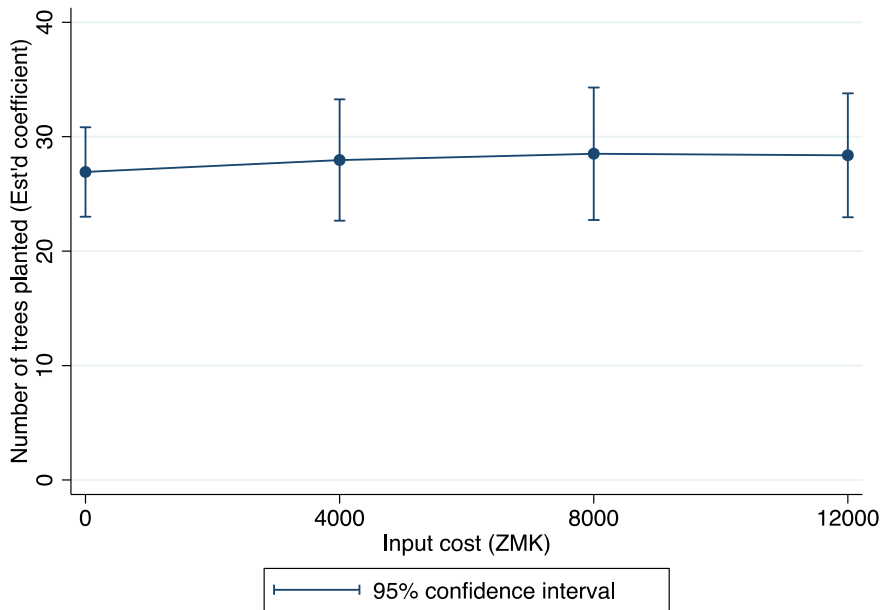
Results I

- Compare across input cost conditions
 - **Take up:** Do liquidity constraints / input costs deter adoption?
 - **Tree planting and survival:** Do subsidized inputs decrease follow through?
 - **Combined:** As input costs increase, do total surviving trees fall?

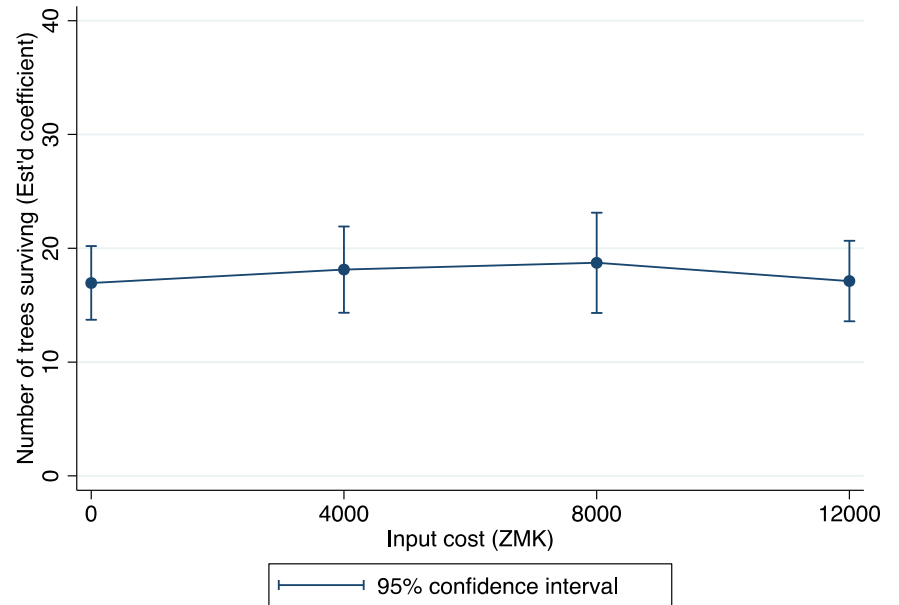
Program take up, by input cost



Tree planting and survival, by input cost

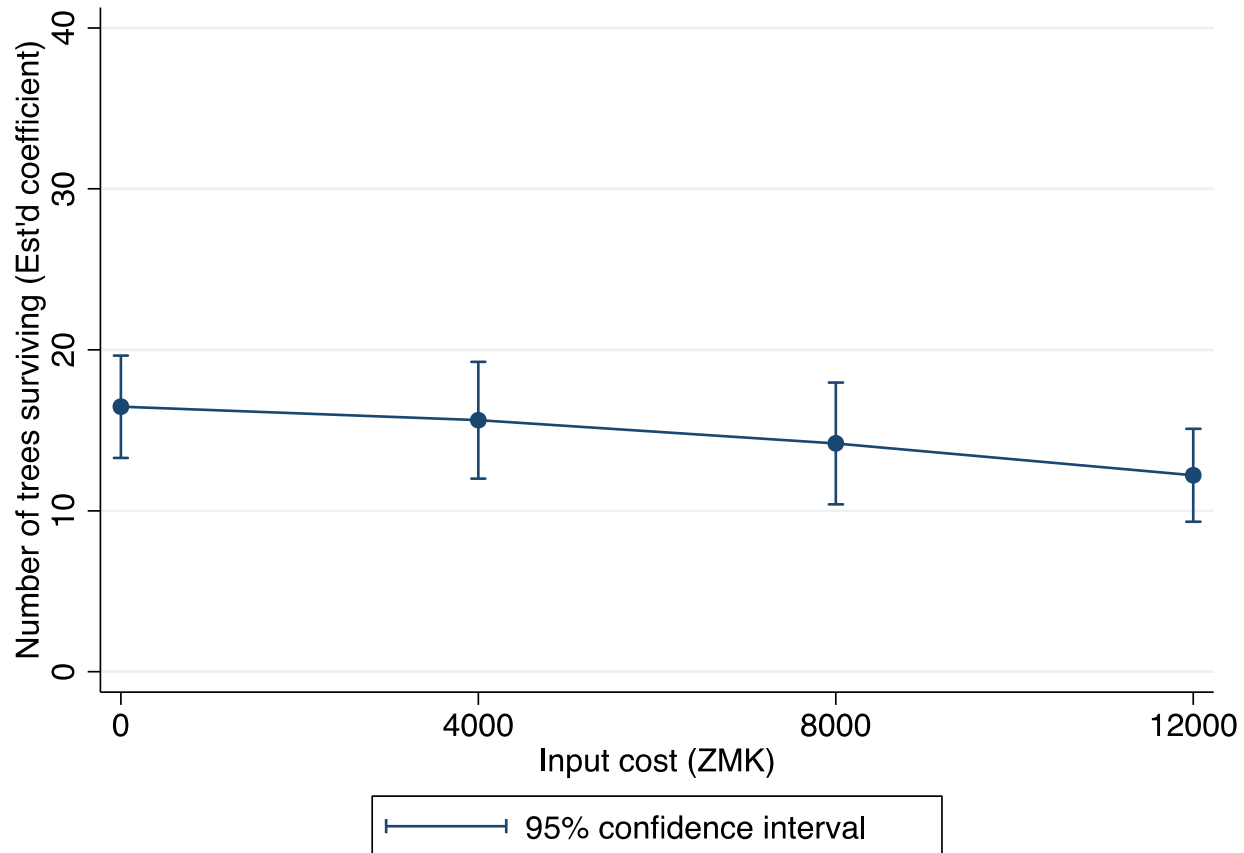


Tree planting



Tree survival

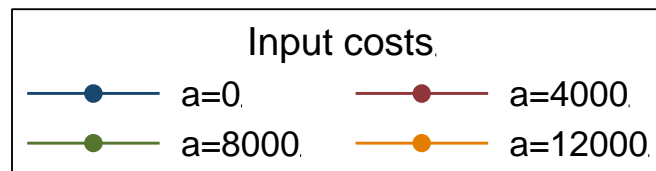
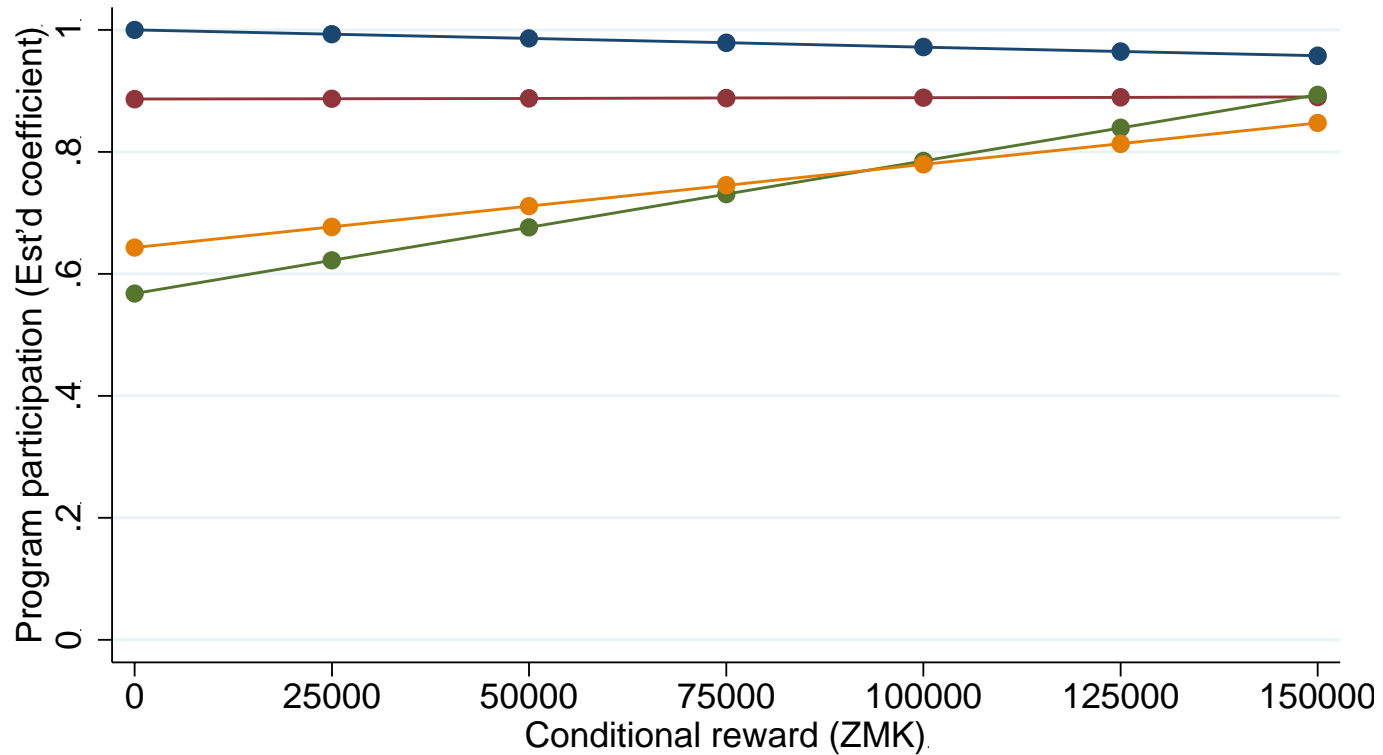
Combined effect of input cost on survival



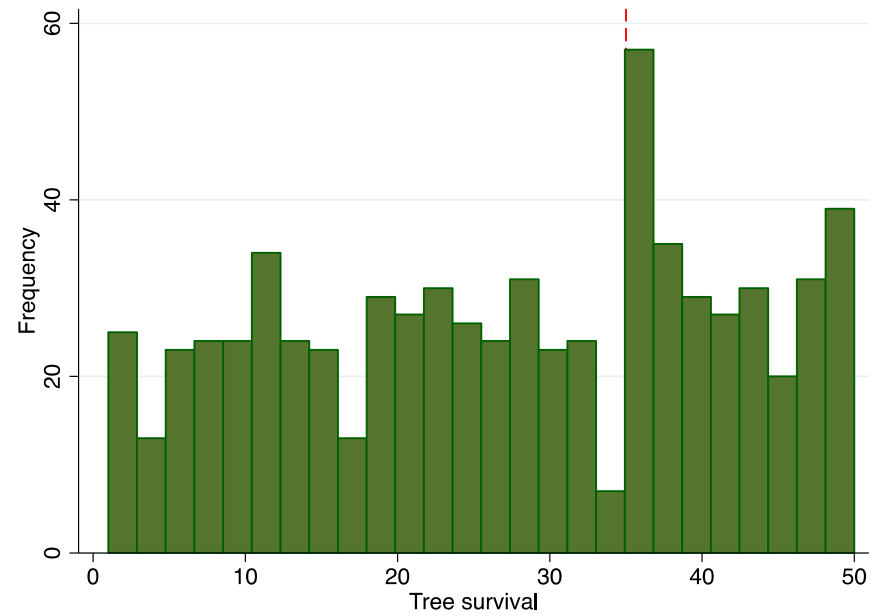
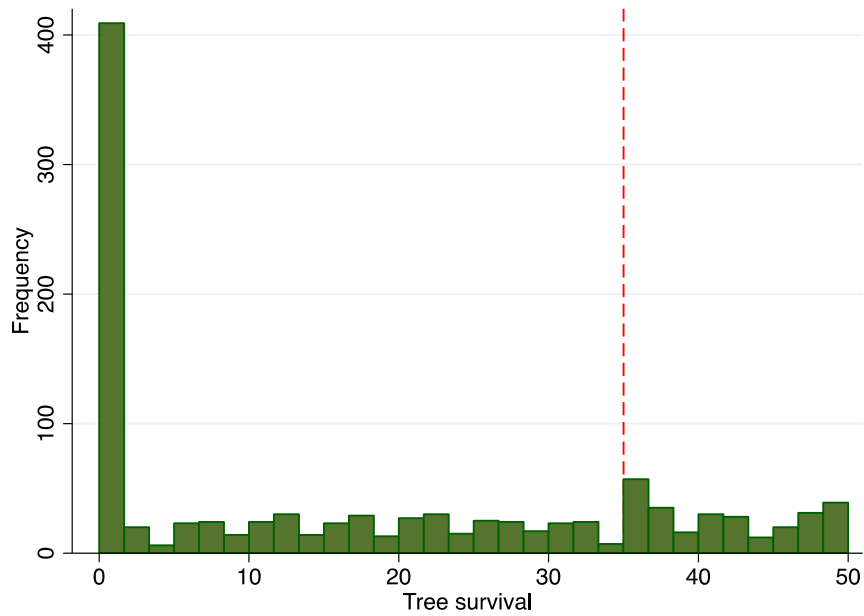
Results II

- Compare across reward (r) conditions
 - **Take up:** Do short run rewards for tree survival generate more program participation?
 - **Tree planting and survival:** Do short run rewards result in greater effort?
 - Do rewards interact with the input costs?
 - **Combined:** As rewards increase, do total surviving trees increase?

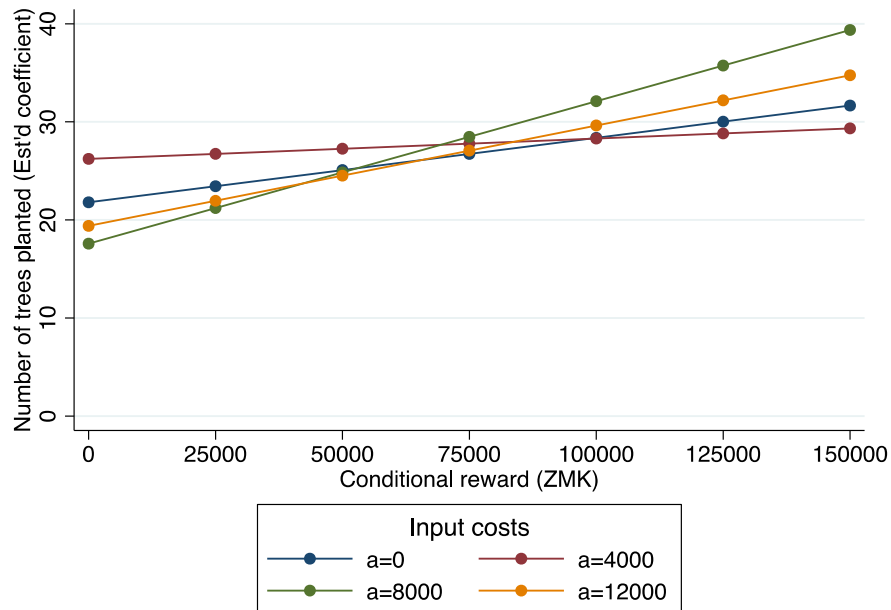
Program take up, by reward level



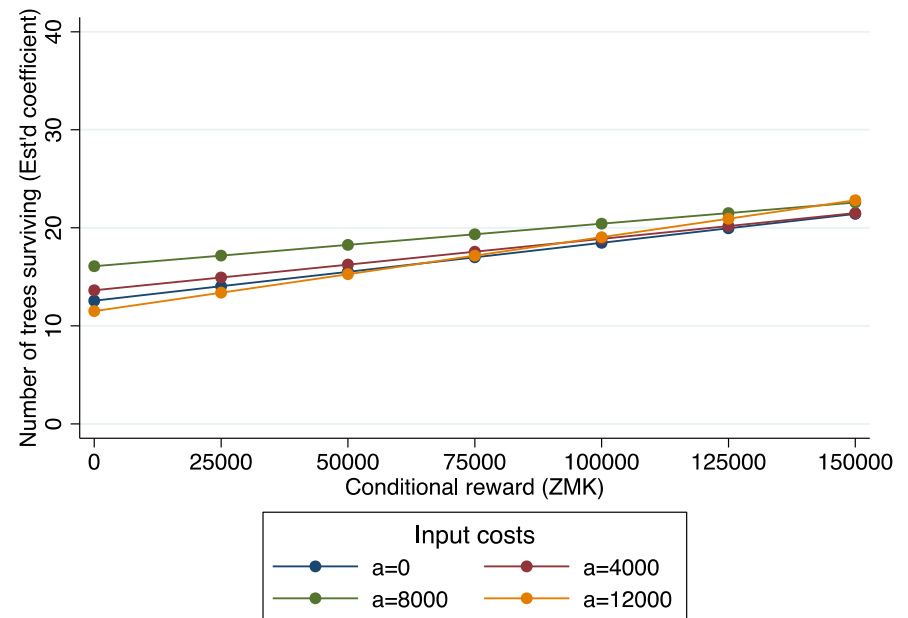
Tree survival



Tree planting and survival, by reward level

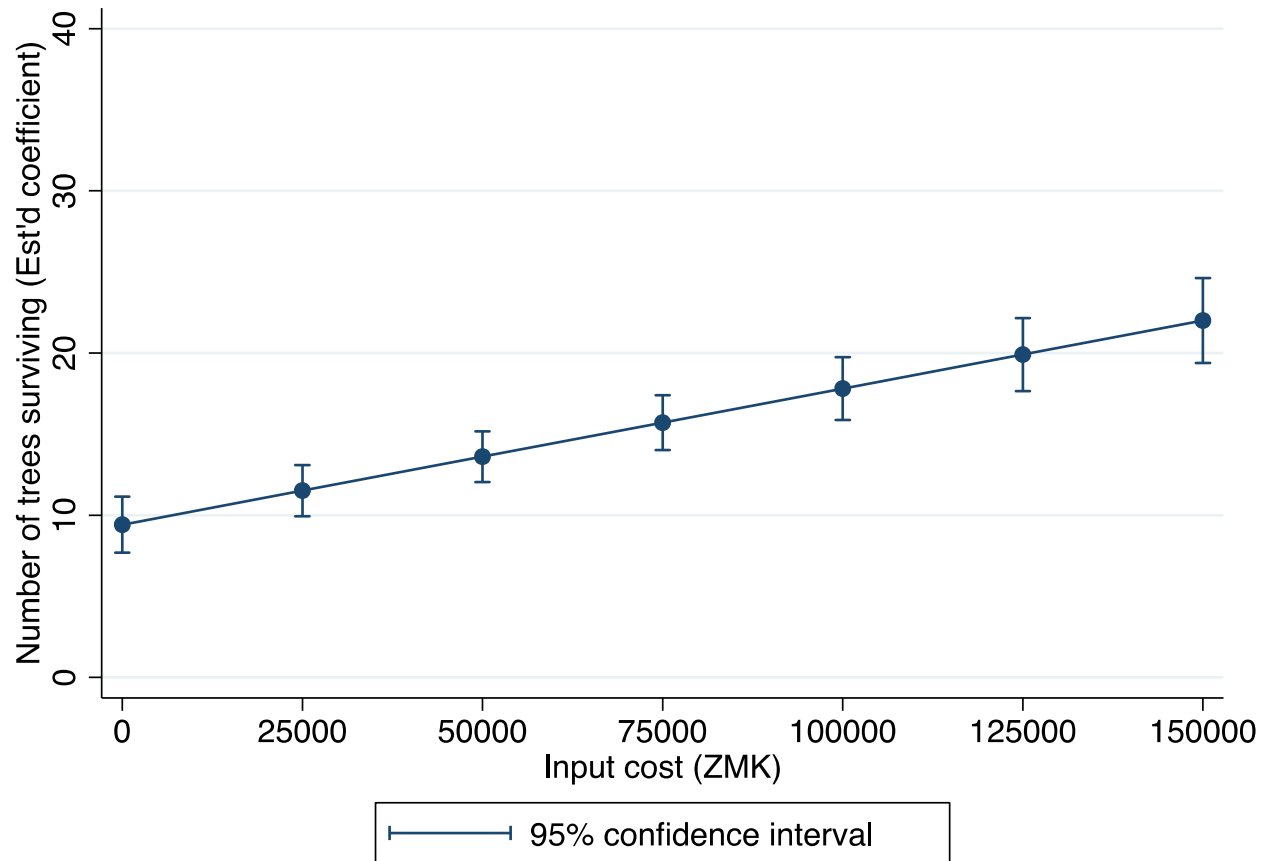


Tree planting



Tree survival

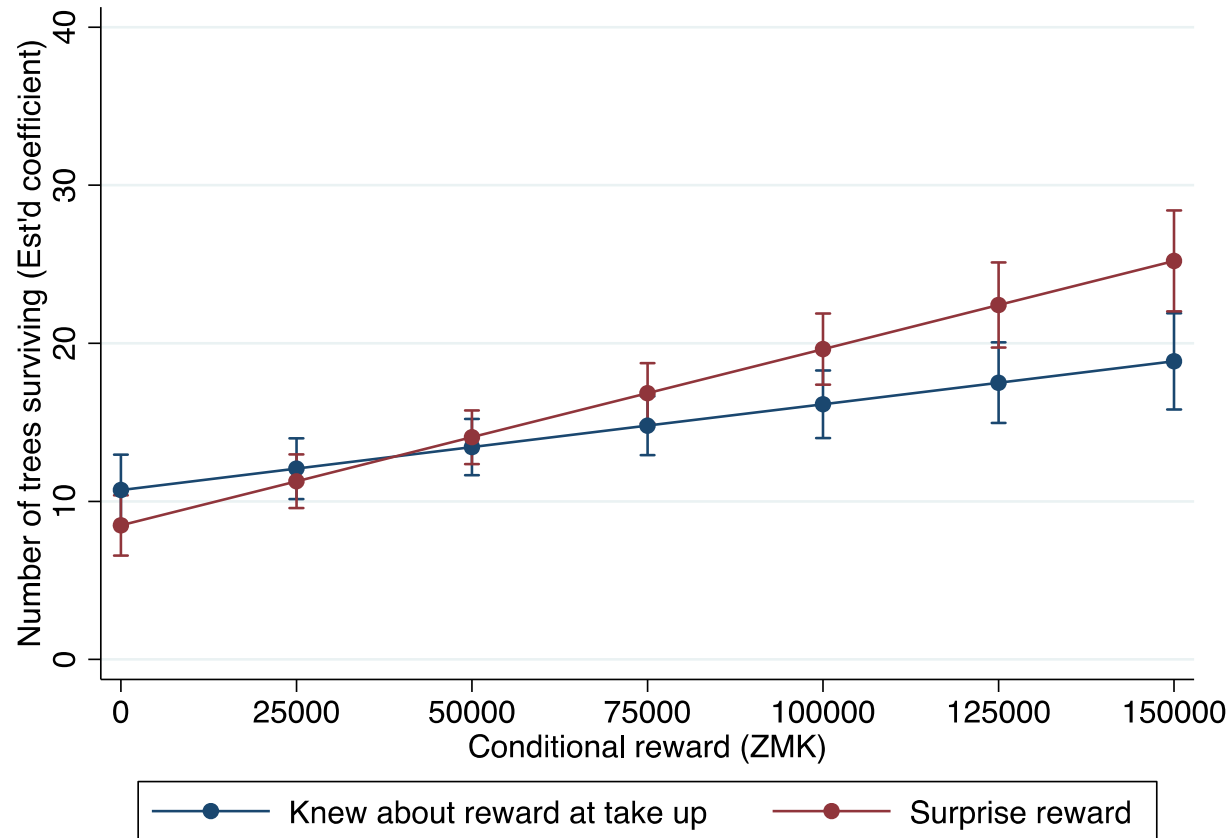
The combined effect of reward on survival



Results III

- Compare those who knew about the reward at take up with those for whom it was a surprise
 - Do short run rewards attract the “wrong” farmers?

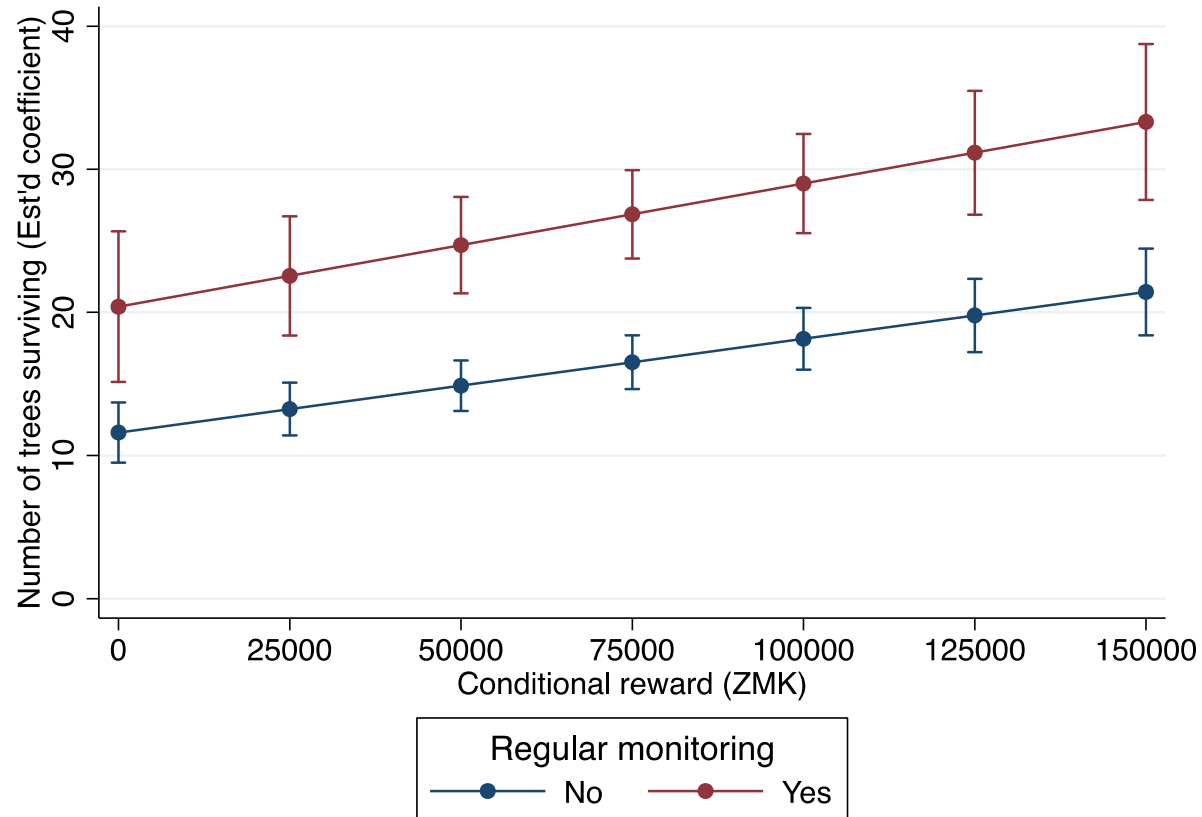
Tree survival, by reward timing



Results IV

- Compare by monitoring condition
 - Do regular visits improve tree planting and survival outcomes?

Tree planting, by monitoring



Results V

- What types of farmers are most interested in the program?
 - What types of farmers are most likely to earn the incentive?
- How much does the farmer group matter?
 - Are farmers less motivated if their neighbors got a higher incentive?

Results by farmer type

	Mean [SD]	Take up	Earned reward
	(1)	(2)	(3)
Household size	5.129 [2.214]	0.01** [0.0048]	0.0107* [0.0057]
Respondent age	37.238 [14.179]	0.0004 [0.0008]	0.002** [0.0009]
Female household head	0.135 [0.342]	0.0192 [0.0310]	-0.035 [0.0378]
Respondent education	4.897 [3.212]	0.0016 [0.0032]	0.0087** [0.0041]
Non-agricultural assets	8.676 [5.111]	0.0029* [0.0016]	0.003 [0.0027]

Results by farmer type

	Mean [SD]	Take up	Earned reward
	(1)	(2)	(3)
Total acres	2.683 [2.357]	0.0091** [0.0041]	0.0006 [0.0060]
Number of fields	2.867 [1.096]	0.019* [0.0100]	0.0052 [0.0121]
Knowledge of musangu	0.64 [0.481]	0.0481 [0.0294]	0.0636* [0.0328]
Planted musangu	0.09 [0.286]	-0.055 [0.0442]	0.0961* [0.0542]
Purchased fertilizer	0.648 [0.478]	0.01 [0.0219]	0.0919*** [0.0299]

Results by farmer type

	Mean [SD]	Take up	Earned reward
	(1)	(2)	(3)
Willingness to take risk	3.752	0.0372***	0.0098
	[1.186]	[0.0117]	[0.0134]
Discount rate	2.423	-0.011*	-0.007
	[1.621]	[0.0067]	[0.0081]
Years with Dunavant	3.842	0.0081**	0.008*
	[3.445]	[0.0040]	[0.0039]

Farmer group effects

- Effect of rewards is statistically the same within group as between
 - Suggests that farmer group effects are not driving the results
- More of the variation in tree survival is explained by cross-group than cross-individual differences
 - A farmer who has seen his YGL > 10 times this year has significantly more surviving trees

Relative rewards

- Farmers with neighbors who are randomly assigned higher incentives *do better*
 - Controlling for farmer's own incentive
- Consistent with motivation spillovers – being near another farmer who is doing well (high incentives) results in higher own performance

Cost effectiveness

- Per tree costs vary with participation rates, share earning rewards, per farmer program costs
 - Tradeoff between enrolling more farmers and more trees per farmer
- High fixed programme costs + low variable costs
 - Subsidize take up without incentives
- High variable costs
 - Cost recovery through inputs, pay incentives

Summary of findings

- Input costs increase take up but not tree survival
 - No perverse impacts of subsidies
- Incentives increase survival conditional on participating
 - Selection into program because of incentives is minimal
- A diverse group of farmers joins the program and earns rewards
- Monitoring improves tree survival outcomes
- Lead farmers and peers matter, but do does individual effort
 - Higher rewards for neighbors has a positive spillover effect

Future research questions

1. What happens after rewards stop?
 - Persistent effects: Incentives motivate investments during difficult first year
 - Temporary effects: Farmers only perform to earn incentive
 - Proposal: Follow up survey in Oct/Nov 2013
2. Why does monitoring increase survival?
 - A number of plausible hypotheses: builds trust, reminder effect, accountability
 - How much monitoring is enough?
 - Proposal: A new study with current or new partners