The extperimeneting sister:

Using framed field experiments (FFE) for *ex-ante* evaluation

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What is an experiment in economics?

- **Experiment**
  - Not the real word, but a model of it
    - "all models are wrong but some are useful"
  - Sterile environment to limit contamination
    - Control the external factors, high internal validity
  - Introduce treatments (policies) randomly
    - Ensures identification, i.e. we have **causality** (if properly done)
- Use ***real*** **rewards** to (hopefully) get real-world behaviour
  - Monetary payment, or similar
    - Non-trivial, 1-2 rural day-wage
  - Participants' choices affect the rewards: incentive to reveal preferences
  - Avoid "cheap talk"
    - For example: may express more pro-social preferences
- **Private decisions**
  - Anonymity to avoid spill-over to real life
  - Limits the type of studies done, e.g. CFM

Motivation for *ex ante* evaluations

- Test out different designs of interventions before costly implementation and roll-out start
- Low costs, but potential high gains

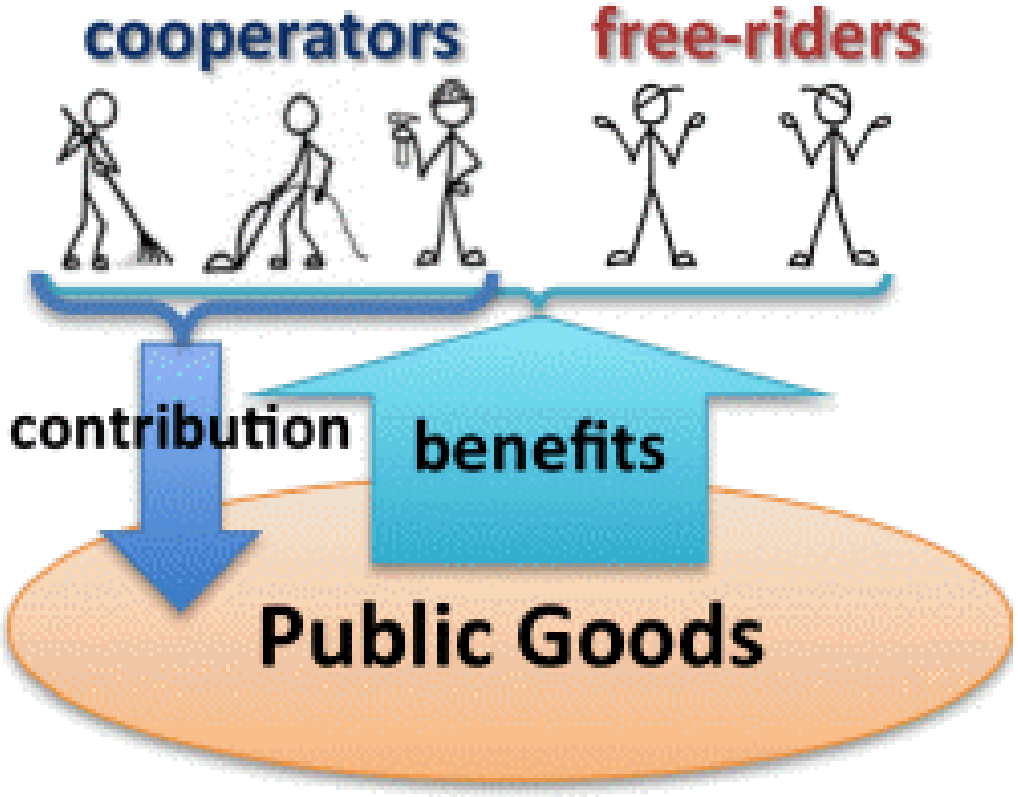
	Questionnaire, choice exp.	**Experiments *(ex ante)***	**Impact assessments *(ex-post)***
Real incentives	no	yes	yes
«Real world»	no	no	yes

Classification of experiments

Name	Internal validity	External validity	Subjects	Framing	Subjects know?	Treatm. by researcher
Lab exp (LE)	High	Disputed	University students	No	Yes	Yes
Artefactual field exp. (AFE)	High	Disputed	"Real people"	No	Yes	Yes
Framed field exp. (FFE)	High/ medium	Medium	"	Yes	Yes	Yes
Natural field exp. (NFE)	Variable	High	"	Yes, the real thing	No (?)	Yes
Natural exp. (NE)	Variable	High	"	The real thing	No	No

The Public Goods (PG) game: a social dilemma

- 5 participants
- 1 million rupiah: keep or put in the public pot
- Contributions are doubled and divided equally
  - All contribute: 1*5*2/5 = 2 mill. each
- Dominant strategy: keep the money
  - None contribute: 1 mill. each
- But, some have social preferences and contribute
  - Example: 3 contribute, 2 free ride
  - Cooperators: (1*3)*2/5 = 1.2 mill.
  - Free-riders: (1*3)*2/5 + 1 = 2.2 mill.
- Better off if all contribute, but none have the incentive to do so
- A common forest:
  - The contribution is by not cutting down, a standing forest produce benefits for all



Amare & Angelsen (2018):
PES design for forest conservation, Tigray Ethiopia

Experimental design

- Played 5 rounds without PES (open access)

$$\pi_{it} = x_{it} + 2\left(\frac{60 - \sum x_{it}}{8}\right), where \;\; x_{it} \leq 5$$

- Each harvested tree (x_{it}) gives 1 ETB;
- One more standing tree gives apublic benefit of 2 ETB, shared equally among those in the group (8)
- A limit on harvest (5)
- Nash Equilibrium = 5; social optimum = 0

- Introduce a treatment in rounds 6-10

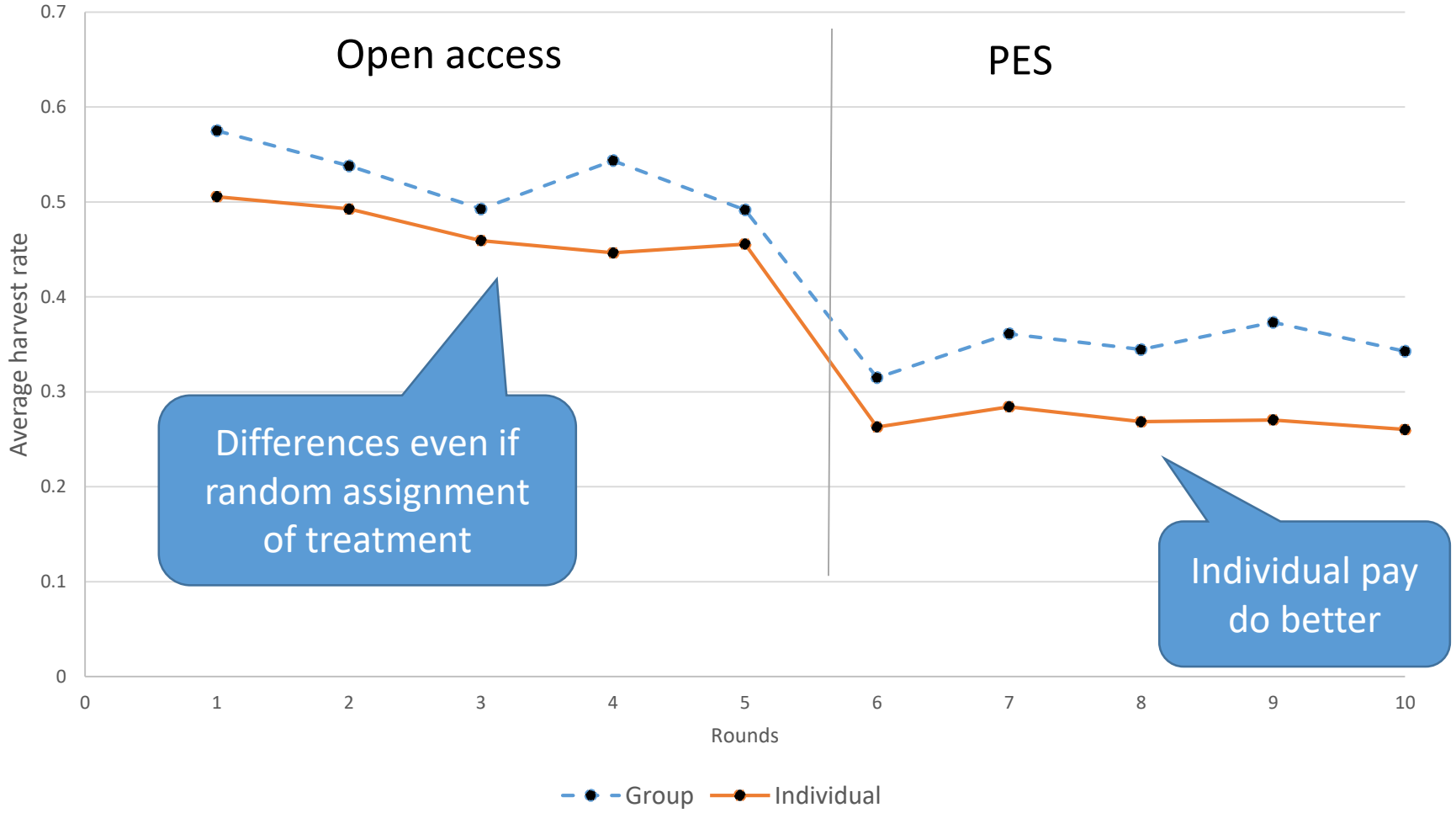
Treatment 1: Ind. vs group pay

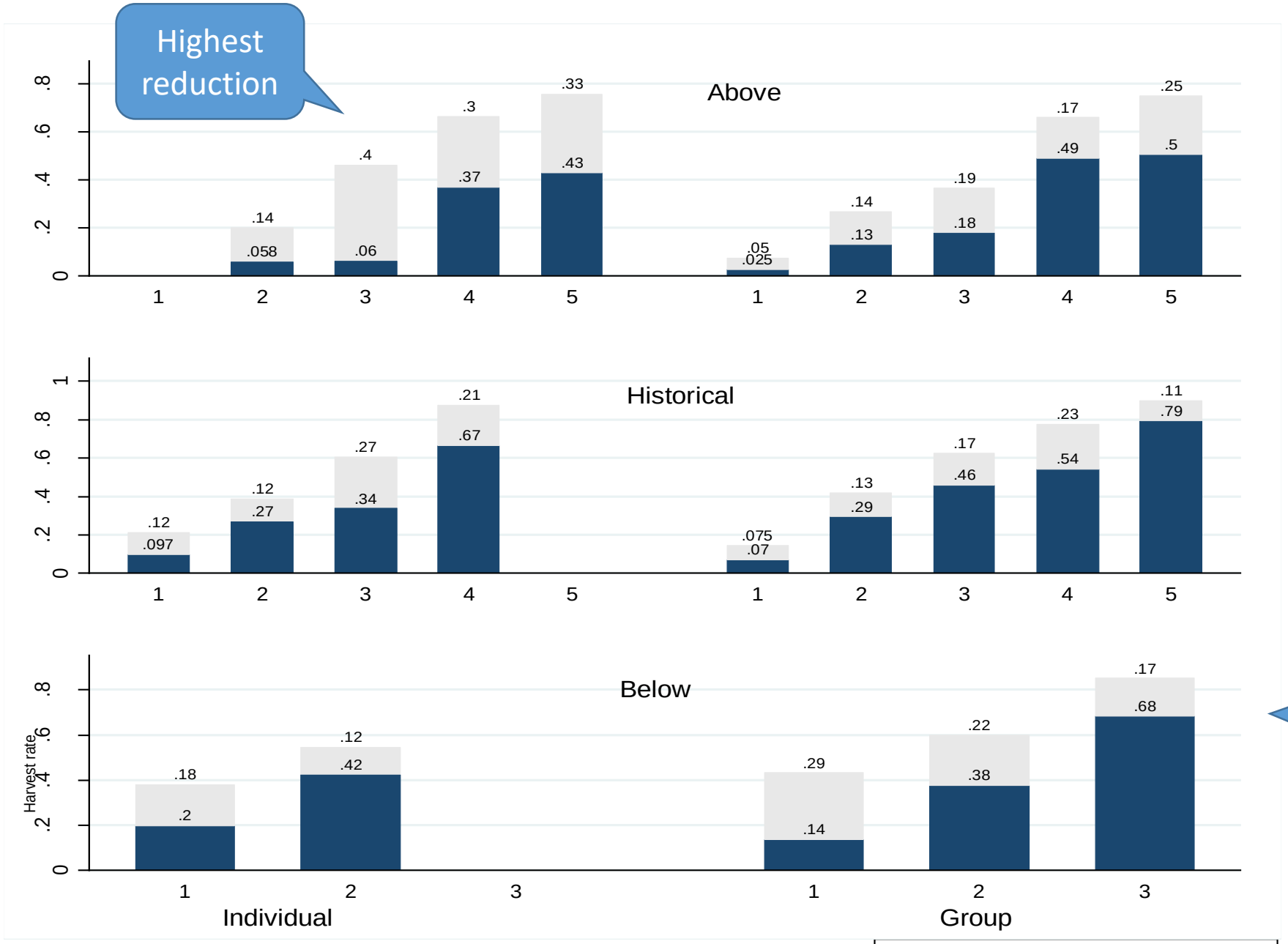
- PES based on individual harvest or average group harvest (equal sharing)
- Incentive effect
  - free riding when group pay
- Uncertainty effect
  - when have a threshold
- Mechanism effect
  - ‘separability assumption’: social preferences are independent of the mechanism design (Bowles and Polania-Reyes 2012)
- Practical considerations:
  - transaction costs

Treatment 2: Different Reference levels

- Set RL at Historical (period 1 average), H-1, or H+1
- When to start paying?
  - Low enough to satisfy the *participation constraint* (below RL)
  - High enough to not waste money (no additionality)
    - Minimize the information rent
- Behavioural economics
  - Anchoring effect (Tversky and Kahneman, 1974)
  - Pro-social and pro-nature preferences (Levitt & List, 2007)
  - Risk preferences, prospect theory and loss aversion
    - Starting point for your assessment
- Incentives vs. anchoring effects

Results: Ind. vs group pay




Highest reduction
Above
Historical
Below
Harvest rate
0
.2
.4
.6
.8
1
.14
.058
.4
.06
.3
.37
.33
.43
.05
.025
.14
.13
.19
.18
.17
.49
.25
.5
.12
.097
.12
.27
.27
.34
.21
.67
.075
.07
.13
.29
.17
.46
.23
.54
.11
.79
.18
.2
.12
.42
.29
.14
.22
.38
.17
.68
1
2
3
4
5
Individual
Group
Average harvest rate after treatment
Average reduction
More than ind pay
FRL

Cost efficiency

- The trade-off between good incentives and costs of high ref.levels (pay for non-additionality)
- Donor: minimize birr per saved trees

RL	Reward	(1) Avg.RL	(2) Sum: $RL - x_{it}$	(3) Sum: $H - x_{it}$	(4) PES (ETB)	(5=4/3) (ETB/tree)
Above (H+1)	Individual	3.4	672	376	543.00	1.44
	Group	2.9	538	232	402.00	1.73
Historical (H)	Individual	2.4	397	397	418.50	1.05
	Group	2.9	326	326	252.00	0.77
Below (H-1)	Individual	1.4	-12	308	158.25	0.51
	Group	1.9	19	326	60.00	0.18

- Clear result: generosity is costly!

Concluding thoughts

- **Collect covariates, to combine with survey data**
  - M2 example: collect preferences on social, env., risk, time and social pref. Can they explain REDD+ adoption and forest outcomes?
- **Pre-testing of policy measures/packages**
  - Community management: many elements (communication, use local knowledge, endogenous rules, social sanctioning, etc.) - few have been tested in the field
  - Social punishment: punish free riders (FRs), punishers of FRs, punishers of punishers of FRs, *ad infinitum* (anti-social punishment)
- **Mechanism testing,** in a theory of change
  - Example: How does decentralization work? Many steps in that argument
  - Example: Exposure to REDD+ projects has changed preferences …..