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TRANSLATING RESEARCH INTO ACTION

Randomized Evaluation Start-to-finish

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Course Overview

1. What is Evaluation?
2. Outcomes, Impact, and Indicators
3. Why Randomize and Common Critiques
4. How to Randomize
5. Sampling and Sample Size
6. Threats and Analysis
- 7. Project from start to finish**
8. Cost-Effectiveness Analysis and Scaling Up

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Micro credit in rural Morocco

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The setting: Al Amana

- Al Amana is one of the largest Microfinance institution in Morocco
- Active loans 30,700
- Cumulated served loans 3,257,000
- Loans \$ 232,440,000
- Large number of branches 464

The setting: Al Amana's expansion to rural Morocco

- Mostly operated in urban areas up to 2006
- New policy started: expansion in rural Morocco
- An area where almost no financial services existed
- 10% have access to credit 6% through informal loans

The needs

- Many reasons for which people would like to borrow
 - Start / expand new business
 - Absorb chocks
 - Consumption durable/non durable
- Reduced borrowing possibilities
- People rely on informal loans or do not borrow

Intervention

- Al Amana opens a new branch in remote rural areas
 - Usually in a small town
 - Well identified nearby villages
 - Offer Al Amana microcredit products in the town and villages
- Loan officers visit villages, organize focus groups
- Al Amana microcredit product
 - Need an investment project
 - Not consumption loans
 - Need to have two activities
- Switch from group lending to individual lending during the experiment

Theory of change

- No access to financial services
- Households decisions about their activity are made in a constrained environment
- Supply of microcredit changes this environment by relaxing the constraint
- Many potential effects

Theory of change: investment

- Existing investment project not realized because of financial constraints
 - Take the microcredit
 - Do the investment
 - Reorganize household's work effort
 - Change in production, resources
 - Repay the loan
 - Change in savings and consumption
 - Can be different in the short run and the long run

Theory of change: side effects

- What about the quality of the initial project
 - Problems in loan repayments
 - Negative effect on consumption or savings
- What about education decision
 - Potential long term negative effect if reduced school attendance: such an effect found in the Bosnia study
- Woman empowerment
 - Business started by women who get therefore their own money and autonomy

Theory of change: what is the motivation for investment ?

- Common view is that poor people are all potential talented entrepreneurs
 - They have the desire and the skills to run entrepreneurship projects
 - Investment projects are entrepreneurship projects to make business and to earn money
- But poor people in rural Morocco also have a painful work
 - Large share of work done outside as daily laborers
 - Purpose might not be to make business but to reduce the share of outside painful work

Theory of change: insurance

- A substitute to insurance: no insurance products available
- Shocks: economic lives in rural villages subject to large shocks:
 - 14% lost more than half the harvest or livestock in the preceding year
- Absorption of these shocks frequently implies to take on household's assets
 - Either monetary or physical assets
- Microcredit is a way to accommodate these shocks
 - Taking a microcredit in case of a shock allows to keep household's asset

Theory of change: inter-temporal constraints removed

- Current decisions can be taken with in mind the knowledge that financial constraints may occur in the future
- Even if people do not take a credit now the environment in which they take their decision has changed
- **Potential effect also on non takers**

Why Evaluate?

- Strong debates surrounding the impact of microfinance
 - For some the silver bullet to fight poverty
 - For other a path to over-indebtedness
- Need evidence based study

Why Evaluate?

- Almost no knowledge about microcredit effect
- Strong selection effect
 - Individuals self select into microfinance programs
 - Microfinance institutions select also individuals
- Difficult to find suitable empirical strategies to deal with selection biases
 - Some attempts using non RCT methods but not convincing
- Large value added by RCTs

Why Evaluate?

- Several RCTs launched at almost the same moment:
 - India (Banerjee & al, 2013),
 - Mexico (Angelucci et al,2013)
 - Bosnia (Augsburg et al. 2013)
 - Ethiopia(Tarrozzi et al. 2013)
- Mostly in urban areas
- These studies take place in areas where there exists several alternative borrowing possibilities
 - Interventions made cheaper credit more easily available

Why Evaluate?

- No knowledge about how people adapt their decisions and working life when the financial constraint is relaxed
- The setting here is unique
- Compare
 - A world without financial services
 - With a world in which these services are made available

Design: operational constraints

- In 2006 Al Amana decided to expand progressively in remote rural areas
- Progressive move
- Process is to have several new branches located in a small town
 - Serving the town and well identified nearby villages

Design: operational constraints

- Al Amana Progression in waves
- Schedule was to have a first wave in march 2006 with 10 new branches
- One additional wave in July 2006 with 30 branches
- One last wave in October 2006 with 40 branches

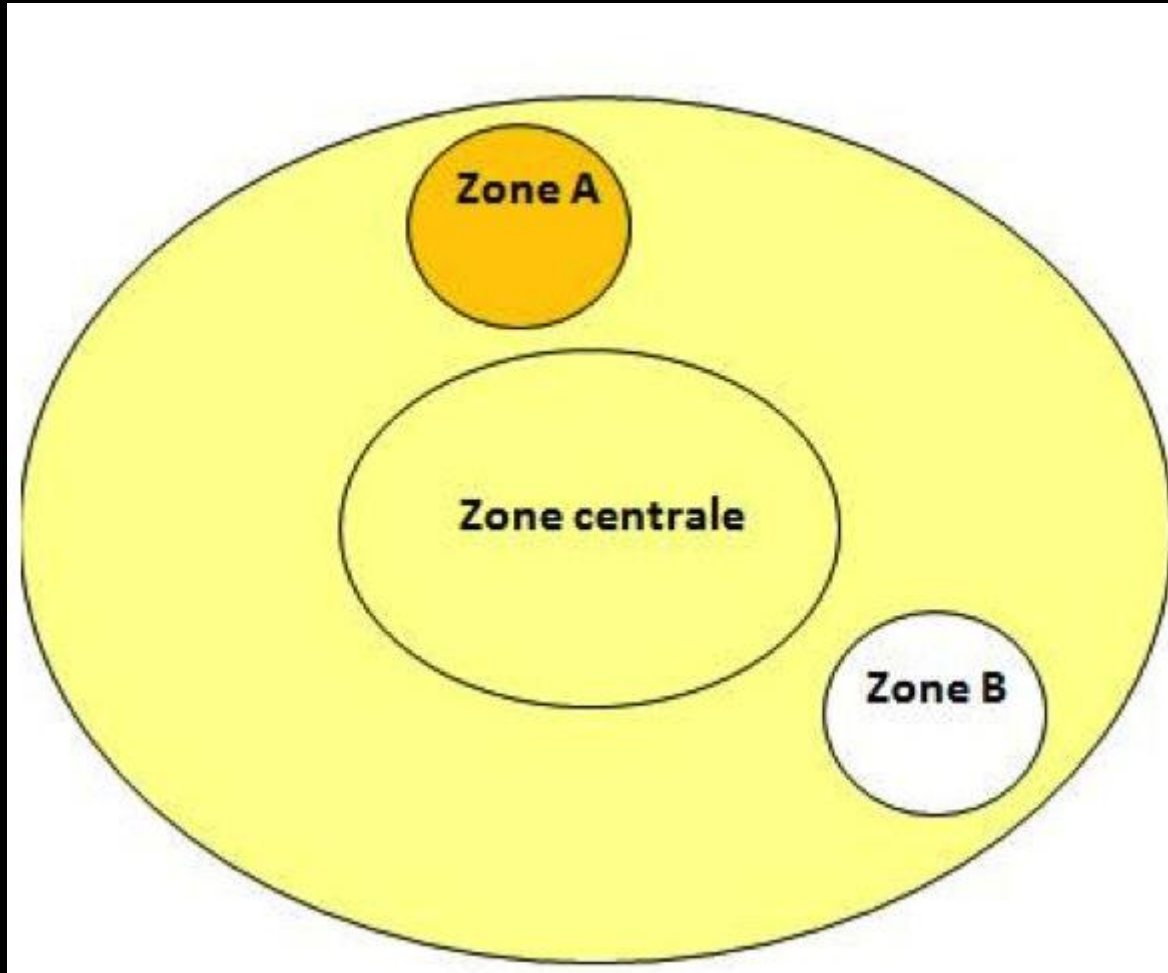
Design: idea

- For each new branch select a pair of villages within the set of villages served by the new branch
- Randomly assign one village of the pair to be a treatment village:
 - microcredit is offered
- The second village of the pair is the control village
 - The offer of microcredit services is postponed for two years

Design: making the idea concrete

- How to select the villages
- They have to be close to the border of the area served by the new branch
 - Get a map of the area with roads and villages and identify potential villages
- They have to be quite similar
 - Do a survey to collect all suitable information: size, activity, # farmers, wealth,...
 - Match the potential villages

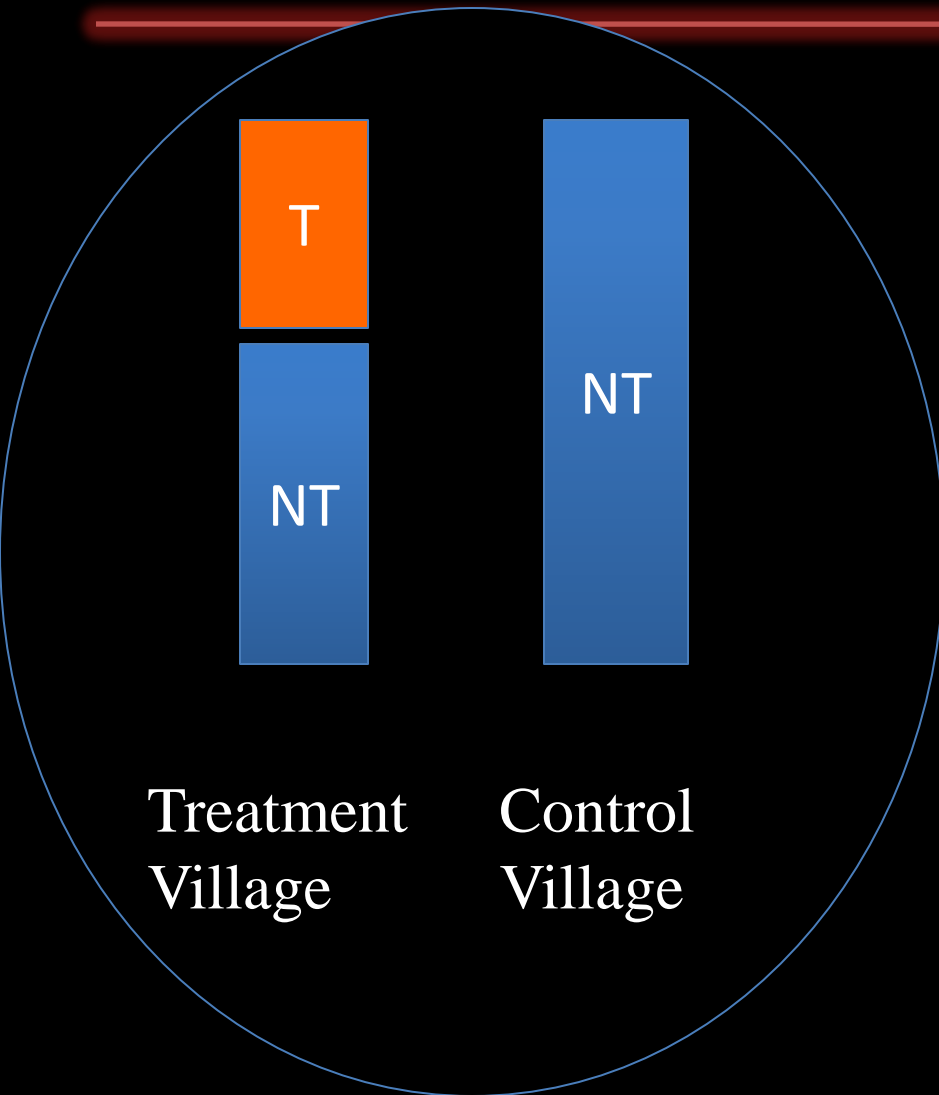
Design: selection of villages



Design: an encouragement design

- All the households will not become micro clients of Al Amana
- Some will, but some others not
- We followed randomly selected people in treatment and control villages
- Do that independently from the fact that they are or not client

Design: an encouragement design



- This is for one pair
- We have many pairs
- Clustered experiment: we need lots of clusters
- Follow everybody randomly selected in T and C villages

ITT or TOT?

- Imperfect compliance: we can look at two types of parameters
 - Impact on households in treatment village: ITT
(Means we look at the impact of making microcredit available)
 - Impact on those who became clients: impact of taking a microcredit TOT
- Recovering ITT is easy: difference between mean outcome in treatment and control villages
- Recovering TOT is more complicated. Need assumption that those who were not client have not been affected
- **Only consider ITT here**

Design: schedule

- Get the map of the area
- Make surveys at the village level
- Match villages and select a pair
- Select households in the village and make the baseline survey
- Randomly assign within pair villages to be treatment or control

Design: Power calculation

- Two questions:
 - How many people do we need to follow in each village
 - How many pairs of villages
- Two important unknown parameters
 - Correlation intra village: villages from a same pair share a lot in common
 - Micro credit take-up: real unknown parameter
 - Use a guess value based on what the microfinance institution was expecting: **70%**

Design: Power calculation

- We are doing a test with $\alpha=0.05$
- **We want to detect a standardized effect of 20%**
- We want a power of 80%
- Rho was chosen low 0.05
- **Take-up assumed to be 70%**
- Choose to survey 25 households in average at the village level

Design: Power calculation

- Run optimal design
- Get the number of pairs of villages

81 pairs

162 villages

- An order of magnitude to keep in mind
- Risk: No real knowledge about the take-up
- Power strongly sensitive to take-up

- Vague 1
- Vague 2
- Vague 3
- Vague 4

Légende

- Structure
- Antenne
- Agence
- Route principale
- Route secondaire

Direction

- Kénitra-Tanger-Khénifra
- Oujda-Fes-Meknes
- Settat-Marrakech
- Casablanca-Marrakech-Safi
- Beni Mellal-Ouerzazate-Agadir
- Région Administrative



Principales villes

- Médina A1
- Ben Debab A2
- Bab Fosh A3
- Ben soude A4
- Anoult El Hejj A5
- Doukkarat A6
- Zouagha A7
- Ouled Tayeb AN
- Borj D1
- Riad D2
- Zitoune D3
- El Mechour D4
- Ouissane D6
- Riad Azzahonia D8
- Zitoune Bouzakri DZ
- Aln Jamaa DR
- M'Nabha Z5
- Souira Z6
- Médina C2
- Daoudiate C4
- Douar Laskar C5
- M'hamid C6
- Aali CA
- Oued Ennachef G3
- Koulouch G2
- Sidi yahya G9
- Oujda G1
- Al Khyam O3
- Anza T2
- Tikouline Y2
- Yacoub Al massour L1
- Takadoun L3
- Hay Salam L7
- Médina L6
- El Kasba I3
- Tanger Msnana F8
- Tanger Bab F7
- Médina I2
- Béni Makada I1
- Cité Jamaa K1
- Sidi Oumane K3
- Derb Soltane K4
- Drissia K5
- Sidi moumen K6
- Sidi maarouf KP
- Hay Hassani R1
- Derb Ghatal R2
- Anta R3
- Hay Mohammadi R4
- Bermoussi R6

Répartition géographique des points de vente d'Al Amana

Identify key players

- Top management at Al Amana
 - Fouad Abdelmouni head of Al Amana
 - Strongly support the research
- Other people working in Rabat. We mainly had to work with them
 - Al Amana a large institution with already bureaucratic procedures
 - Not a 100% responsive environment but however things went well

Identify key players: field staff

- Key they understand the experiment
 - Need to go very often in the field to monitor and listen
 - Check they understand what they have to do
 - Getting the maps was not easy: they didn't know the area
 - They just started a new activity with 100's of things to do
 - Experiment was just an additional thing, a bit weird
- No strong incentives to go to the treatment villages
 - Remote villages
 - Take sometimes one day to go
 - Obtain from Al Amana they get reimbursed for travel expenses and they have financial interest in having loans in treatment villages

Identify key player: funder

- The study was financed by AFD
- The agency in charge of development programs in France
- They have a large field experience
- Important to have them involved all along the process

Measurement

- Two large surveys conducted
 - Baseline and endline surveys, 2 years after
 - Very important to have a baseline: need to show that the sample is balanced
- The survey lasted almost 2 hours
- Based on existing household questionnaire used by many institutions
- Large set of information

Measurement: Intermediate outcomes

- Lending: we want to know whether offering microcredit indeed made a change in the amount household borrowed
- We want to know if the amount borrowed from various sources
 - Informal, formal, formal IMF
- We want to know also the repayment burden

Measurement: Final outcomes

- Activity: very detailed information, know the production of cherries, figs, olives, carrots... same for livestock, same for business
- Know detail of activities at a very detailed level
- Know also the amount self consumed, the amount sold, the amount stored
- Know by activity all expenses at a very detailed level
 - Wages, input
- Know also the investment
- Know productive assets owned by the household

Measurement: Final outcomes

- Know each household member labor effort inside and outside the household
- Know if young people attend school
- Know the consumption of very detailed consumption items
- Get information about women autonomy

Measurement: Attrition

- We identified household at the baseline survey
- We then follow them two years later
- Some of the households were no longer in the village
- Attrition measure the share of households for which the endline survey was not passed
 - The average is 8%
- Differential attrition compare attrition rates between treatment and control
 - 7% in the treatment - 9% in the control
 - Small differential. Ignore it

Measurement: Implementation

- First RCT we did in Morocco
- Difficult to implement surveys
- Administrative procedure to access villages
- Need to get the authorization from local authorities
- Ask a private firm to do the job
 - Lots of problems however
- For the RCT we have since been conducting in Morocco we preferred to organize our own enumerator teams

Planning

- Al Amana progress in rural areas
- Schedule and reality
 - Initially planned to have three waves in March, July, October 2006
 - In the end four waves in March, October 2006, February and July 2007
 - 10 months delay: not bad in fact for such an organization!

Timing

- Al Amana send us the list of new branches
- New branches are created and a loan officer comes there
- Draw a rough map of the area, with villages and roads. Town is served but no villages
- Identify a list of potential villages
- Send the private firm to survey the villages
- Choose the pair
- Tell Al Amana to serve all villages but the pair

Timing

- Ask the private firm to do the surveys in the pair of villages
- Draw the treatment and control within pair
- Tell Al Amana which is the control
- Al Amana goes intensively in the treatment village to serve microcredit products

Result: loans

- Almost no credit available in control group
- Offering microcredit lead to a substantial increase in loans
- Al Amana clients: +16,7%
- Loans (from the survey): +9%

- Good but... far from what was expected: 70%
- Power at risk

Results: loans

- Large increase in borrowed amounts from Alamana
- Compute the difference between treatment and control villages
- **ITT estimate: 793 Dhs*****
- Mean that the additional amount for clients is
$$793/0.163=4865 \text{ Dhs}$$
- **Only look at ITT difference**, but keep in mind that only a small fraction get additional funding
 - Small take-up reduces apparent magnitude of effects

Results: loans

- Total amount borrowed by the household
 - IMF + all other channels
- Control mean 1,882: impact 1,193***
(Mean in treatment group is 1,882+1,193)
- No substitution with other existing channels
- **Real increase in available financial resources**

Substantial increase in activity

- Asset 15,982 control: impact 1,454**
- Sales+Self-consumption 39,450 control: impact 6,090***
- Expenditures 21,394 control: impact 4,079**
- Profit 4,934 control: impact 2,011*

Are these numbers large?

- This is ITT
- TOT effect would be obtained dividing by take-up.
Here for production :
$$6,090/0.16=38,062 (=96\% \text{ of control mean})$$
- Also compare to increase in available funds (1,193)
$$2,011/1,193=1.70$$

Contrast between the low take-up and the large impact!

Substitution among income sources

- Total income 27,670 control : impact 447ns
- Income from self activities 9,056 control: impact 2,011*
- Income daily labor 15,748 control: impact -1,052 **
- Sales of assets 709 control: impact -679**

Substitution among income sources

- Main effect is to do a substitution between income sources
- Households have members working as daily laborers
- They shift their activity from daily labor to self employment

Partial substitution in hours of work

- # hours of work per member per week
- Total 27.5 control: impact -0.6ns
- Household activity 9.0 control: impact 0.2
- Outside 6.5 control: impact -0.6**
- Chores 12.0 control: impact -0.3*

- Purpose is to re-allocate working hours partially to self employment activity
- Also a reduction ns in total hours

Consumption

- Do not see large effect on consumption
- A small ns reduction of total consumption
- Located in some specific items (social events)

Conclusion

- Not a huge effect of microcredit supply
- Far from ideas that take-up will be very high and households will all become entrepreneurs
- However large contrast with impact on beneficiaries
 - Huge impact on activity
- Why a so small demand!

Conclusion

- Another striking result:
 - Room to increase labor
 - But no increase in labor
- Mainly substitution of inside labor to outside labor
 - Improvement of utility do not come from increase in resources?
- About to get data for an additional survey 5 years after randomization