Experimentation to Inform Product and Policy Design

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Discussion Agenda

- **Experimentation to improve products**
  - Capital One
  - Micro-finance grace periods
  - Joint vs. individual liability lending
- **Experimentation to *evaluate* social impact of products**
  - Why and how of evaluating?
  - Credit
  - Insurance
  - Savings
  - Entreprenuership

Example: Capital One Credit Cards, USA

- **Co-Founder Rich Fairbank's Vision:**
  - Turn a business into a scientific laboratory where every decision about product design, marketing, channels of communication, credit lines, customer selection, and cross-selling decisions could be subjected to systematic testing using thousands of experiments
- **Examples of randomization:**
  - 14-point font vs. 12-point font on envelope
  - Deadlines for response
  - Interest rate offered
  - Credit line offered
  - Nearly every business decisions: currently conducts 80,000 experiments per year
- **Results:**
  - Became the fastest growing credit card company in the world
  - $35 billion equity valuation

Example: Grace Period in Microfinance Lending

- **The Claim: Rigid lending structure, requiring immediate repayment, unduly limits investments with longer-duration payback period**
- **The Experiment (Field et al., 2013):**
  - 845 microfinance clients in Kolkota, in 169 five-member groups
  - All receive individual-liability loan for Rs. 4,000-10,000
  - "Control group" – normal repayment, beginning two weeks after disbursal
  - "Treatment group" – two month grace period
- **The results:**
  - "Grace period" group invests 6% more in business
  - Three years later: "grace period" group reports 900 Rs. more average weekly profits
  - Default is higher among those with a grace period

Example: Group vs. Joint Liability Lending

- **The Question: Is group liability an essential feature of microfinance? (Gine and Karlan, 2016)**
- **The Experiment: Among 169 borrowing centers of Green Bank in the Phillipenes, randomly assign half to individual liability, while other half remain as group liability**
- **The results:**
  - **No change in default in the short- or long run**
- **Follow-up**
  - **Open up new centers either under individual or joint-liability**
  - **No difference in default; individual liability attracts more clients**

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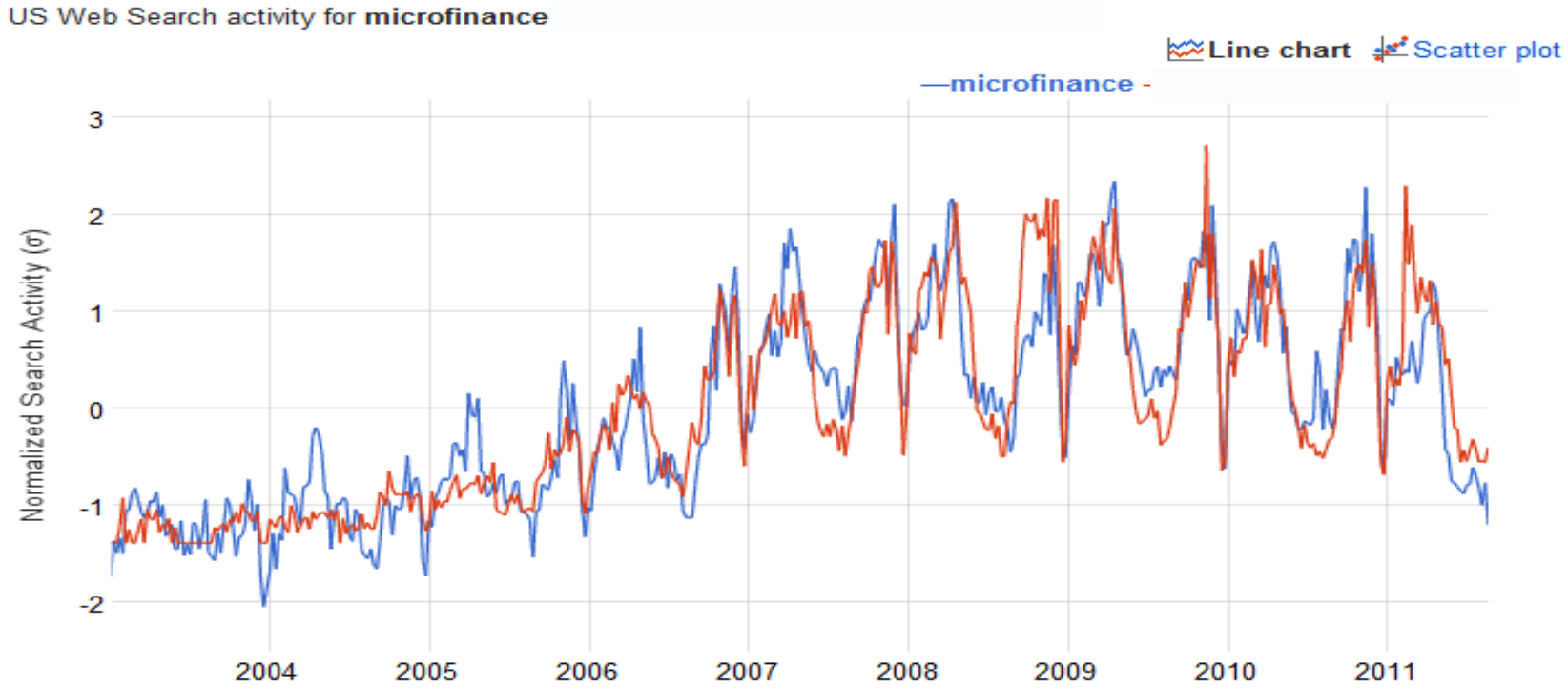
  - **Insurance**
  - **Savings**
  - **Entreprenuership**

The evidence gap on microfinance

1. **We have know a lot about some aspects of microfinance**
   - Numbers of clients
   - Repayment rates
   - Even information on clients
   - Demand from the poor for microfinance

2. **What is missing?**
   - To what extent are clients and communities better off than they would have been in the absence of microfinance?
   - Are there ways to structure the product to preserve the good but bring down the price?
   - How beneficial is training etc?

Correlations are not always what they seem…



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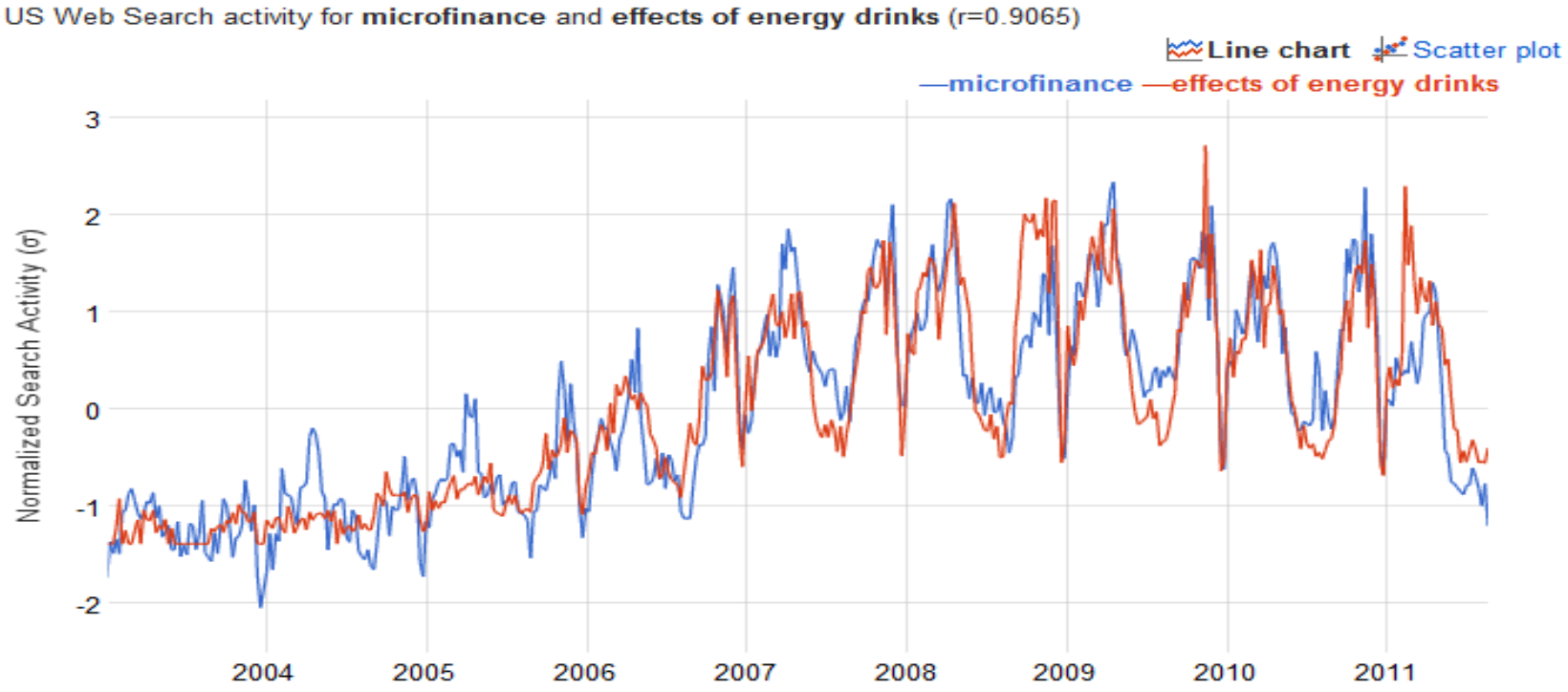


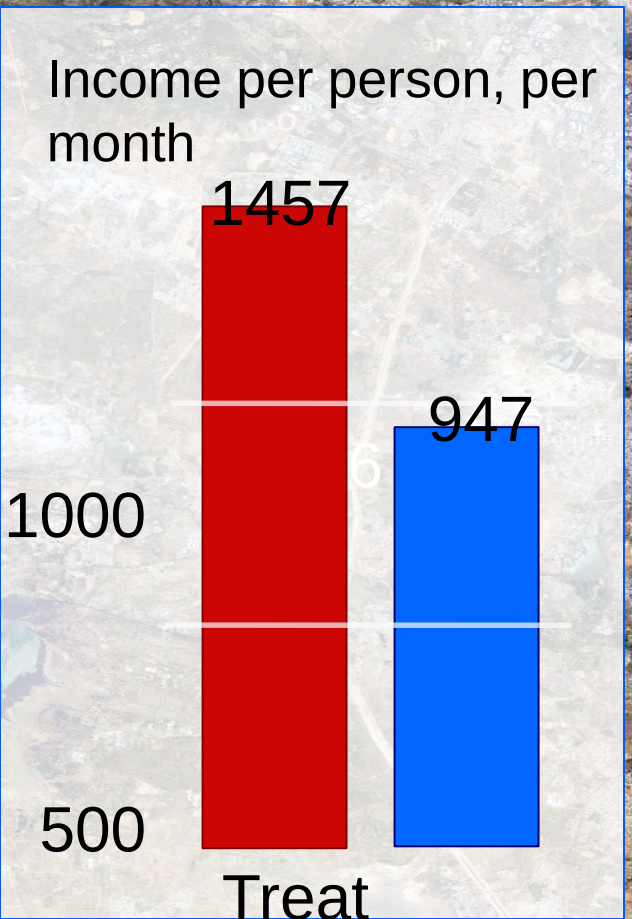
What do we mean by Impact?

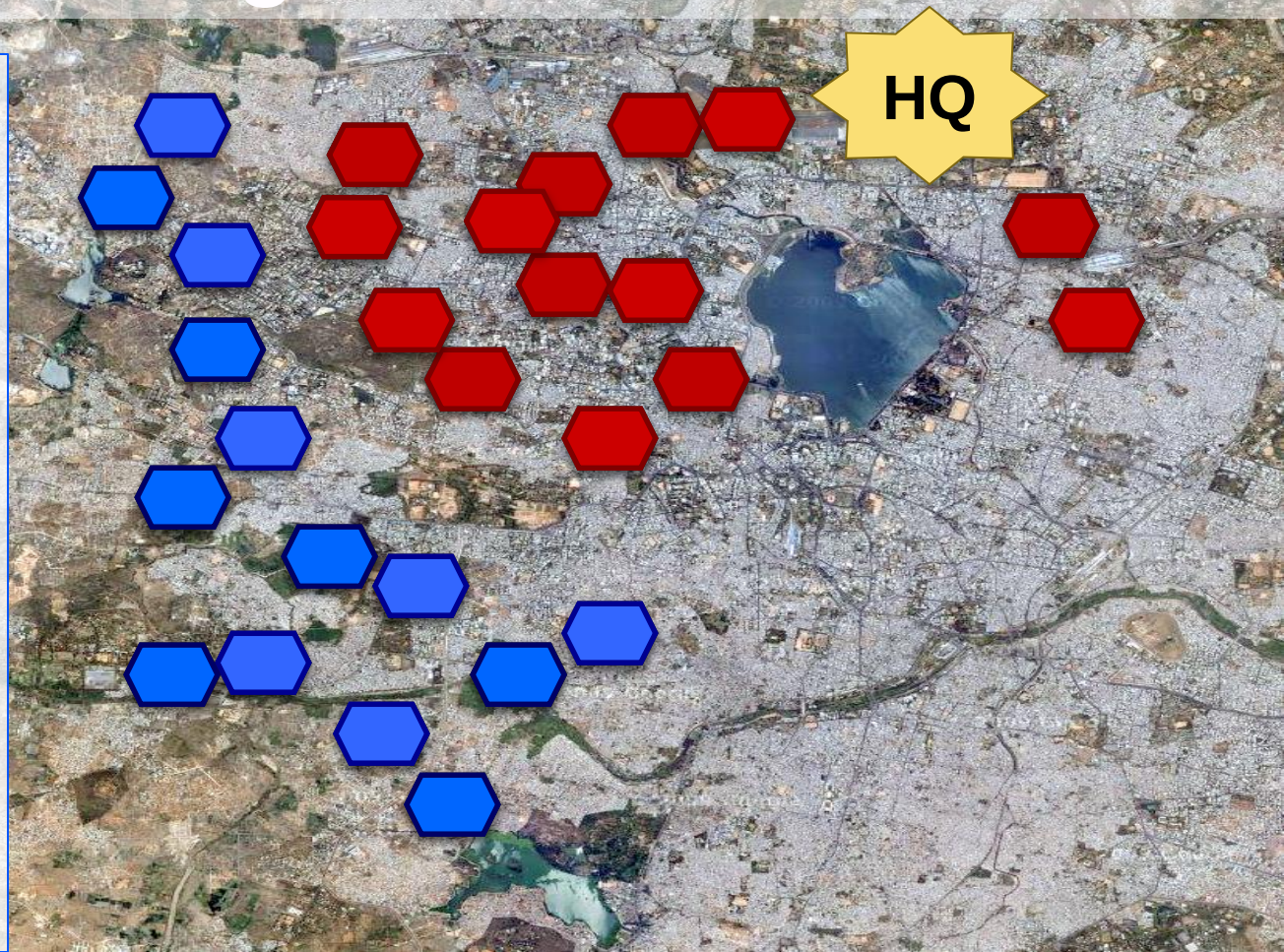
- **Impact evaluation measures:**
- **How have the lives of clients changed compared to how they *would have changed* in the absence of the program**
- **Note this is different from "How have their lives changed"**

Measuring impact of microfinance is hard

1. **Standard ways**
   - Compare those with and without microfinance in the same community
   - Compare communities with and without microfinance
2. **Those who sign up for microcredit are different from those who don't**
3. **Communities where microfinance organizations go first are different**
4. **Want to compare those who did sign up with someone who would have signed up if given the chance**
5. **But don't know who would have signed up**

Non-random assignment





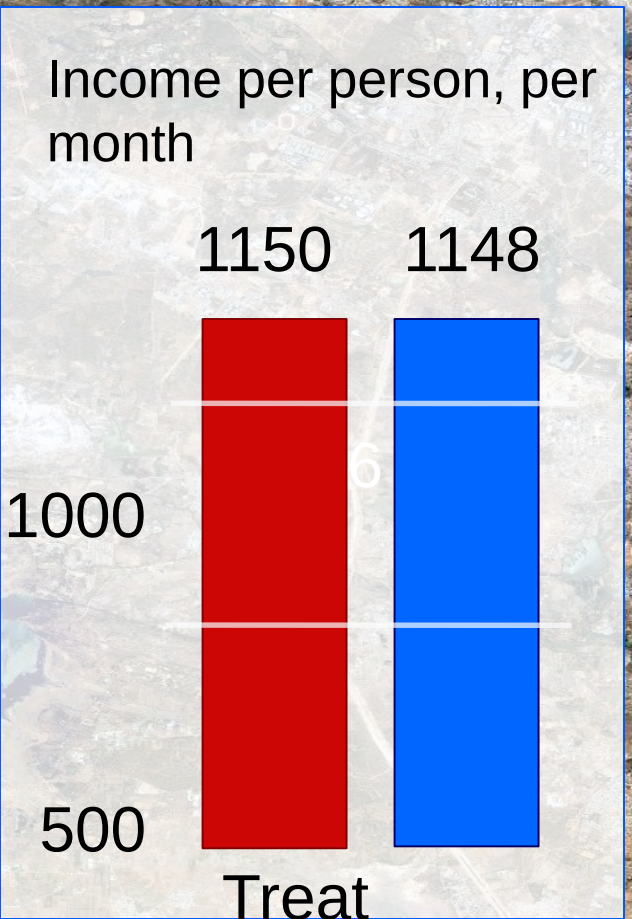
Randomized evaluation of microcredit

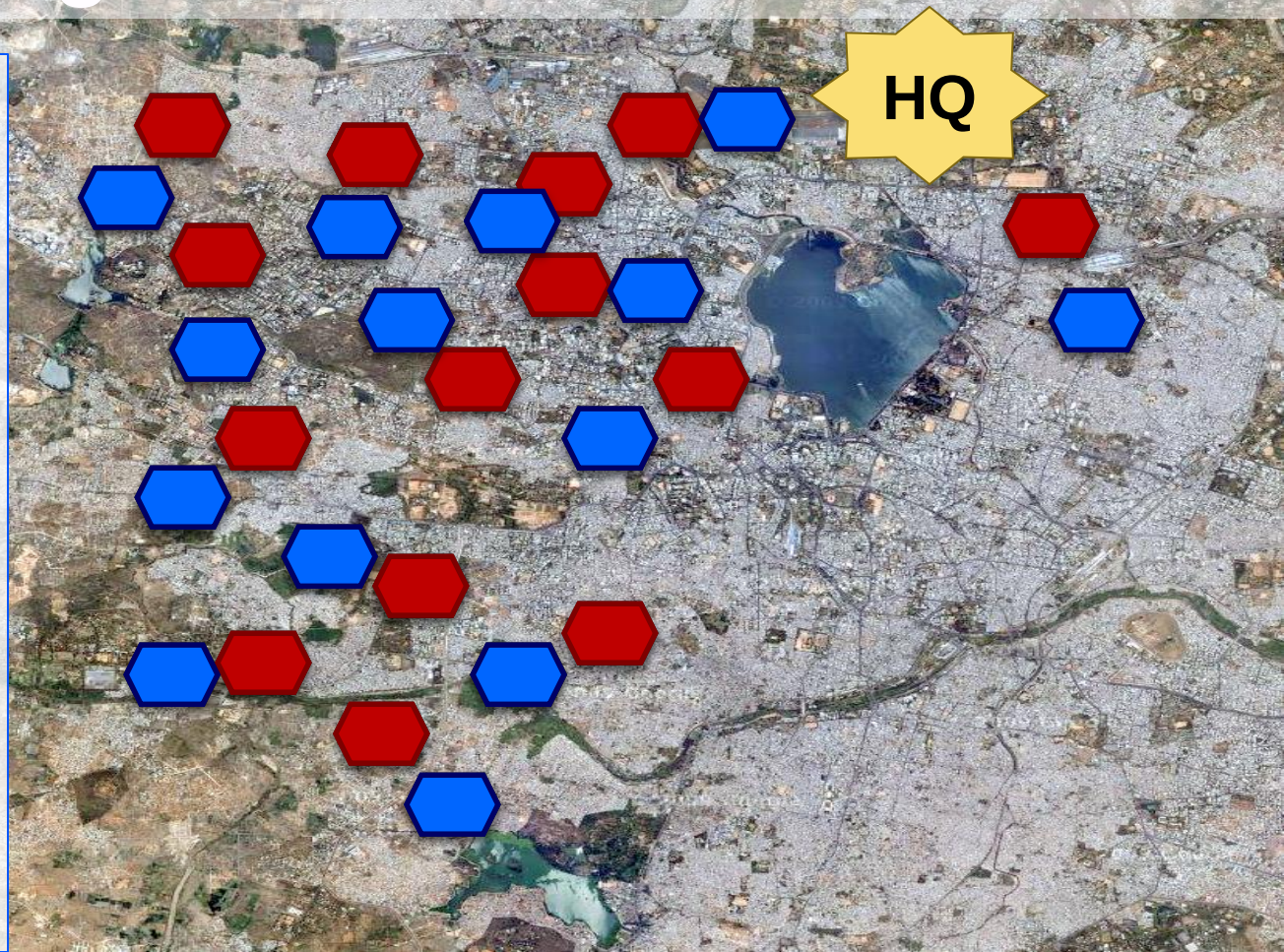
1. **Randomized evaluation solve the selection effect**
   - those that get the program and those that don't are the same on all dimensions (on average) because they are chosen at random

2. **Community based RE**
   - Randomize which community gets microfinance
   - Compare outcomes in one set of communities (with microfinance) to another set (without)
   - Allows you to measure spillovers—or whole community effects

3. **Individual based RE**
   - Take border line applicants and randomize who gets a loan
   - Only gets at the effect on the marginal person
   - Only gets the individual impact
   - Larger sample, more precise estimate

Random assignment





What do we really know about microfinance's social impact?

- **J-PAL and IPA Randomized Evaluations**

education
rural development
finance/ microfinance
environment
health
participation
gender/ discrimination
J-PAL offices

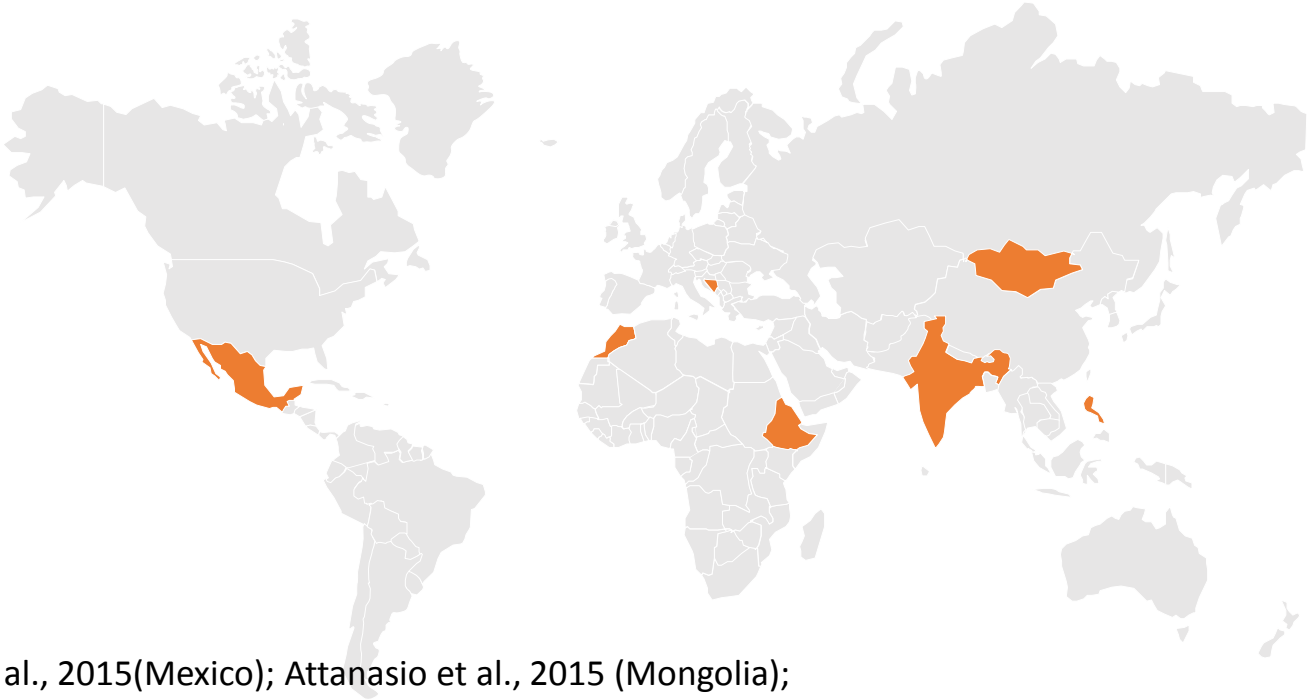
Classic microcredit model

Reduces MFI screening costs and minimizes defaults

- Group lending
- Immediate repayment
- Business-related loans
- Often women borrowers

Angelucci et al., 2015 (Mexico); Banerjee et al., 2015 (India);
Crépon et al., 2015 (Morocco); Tarozzi et al., 2015 (Ethiopia);

Evidence on classic microcredit model



Angelucci et al., 2015(Mexico); Attanasio et al., 2015 (Mongolia);
Augsburg et al., 2015 (Bosnia and Herzegovina); Banerjee et al., 2015(India);
Crépon et al., 2015 (Morocco); Karlan et al., 2015 (The Philippines); Tarozzi et al., 2015 (Ethiopia)

What does a classic microcredit model look like?

Product details	
Women Only	3 of 7: India, Mexico, Mongolia
Entrepreneurs Targeted	6 of 7: All except India, but no strict enforcement on loan use
Joint Liability	5 of 7: Group size ranged from 3 to 4 members in Morocco to groups of 10 to 50 in Mexico
Collateral	3 of 7: Mongolia (savings), Bosnia-Herzegovina (co-signer), Ethiopia (informal)
Interest Rate (APR)	12% to 27%, excluding 60% (Philippines) and 110% (Mexico)
Loan as% of Income	6% (Mexico) to 118% (Ethiopia)
Repayment	Weekly, biweekly, or monthly
Maturation	4 months (Mexico) to 16 months (Morocco)

Key findings

- Demand for many of the microcredit products was modest
- Expanded credit access did lead some entrepreneurs to invest more in their businesses
- Microcredit access did not lead to substantial increases in income
- Expanded access to credit did afford households more freedom in optimizing how they earned and spent money
- There is little evidence that microcredit access had substantial effects on women's empowerment or investment in children's schooling, but it did not have widespread harmful effects either
- Variations on the traditional microcredit model can potentially improve the social impact of credit

Overall findings by country

Outcome	Bosnia & Herzegovina	Ethiopia	India	Mexico	Mongolia	Morocco	Philippines
Business ownership	↑	–	–	–	↑	–	–
Business revenue	–	–	–	↑	–	↑	–
Business inventory/assets	↑	No data	↑	No data	↑	↑	–
Business investment/costs	–	–	↑	↑	No data	↑	↓
Business profit	–	–	–	–	–	↑	–
Household income	–	–	–	–	–	–	–
Household spending/ consumption	–	↓	–	↓ ↑	↑	–	– ↓
Social well-being	–	–	–		–	–	

Impact Evaluations of Weather Index Insurance

- **The hypothesis: farmers under-invest because they are exposed to risk**
- **The treatment:**
  - **Cole et al. (2016): 1,500 farmers in AP, half of whom get free insurance**
  - **Mobarak and Rosenzweig (2015): ca. 3,000 farmers in India, some randomly offered discounts**
  - **Karlan et al. (2015): 2,300 farmers in Ghana, half offered free insurance**
- **The results:**
  - **Andhra Pradesh: 5 percentage points more likely to plant cash crops**
  - **Pan-India: farmers with insurance plant riskier varieties of rice**
  - **Ghana: Farmers with insurance plant more maize (increase investment)**

Targeting the Ultra Poor

- **Banerjee, Duflo, Chattopadhyay, and Shapiro (2013)**
- **Bandhan provides free asset transfer (animal) + trainint to "ultra-poor" in West Bengal**
- **After 18 months recipients "graduate" to microfinance borrowing**
- **Impact on treatment group:**
  - **Higher consumption (64 Rs/month)**
  - **More hours worked**
  - **More assets: 1.2 more goats, .3 more cows, and .5 more fruit trees**
- **Tested again in Ethiopia, Ghana, Honduras, India, Pakistan, and Peru**
  - **21,000 study participants over two years**
  - **Greater assets, more savings, more time working, and more food security**
  - **Income generated between 1.3 and 4.3 times cost of program**

Challenges of Impact Evaluation

- **Very expensive**
  - Household survey costs $10 (India) to $50 (South Africa)
  - Need large samples, 3000-4000
- **Household surveys are very noisy**
  - How much did you eat last week?
  - How much did you earn last month?
  - How profitable was your business?
- **Internal validity**
  - Need to ensure large difference in take-up between treatment and control groups
- **External validity**
  - Showing one program does not reduce poverty doesn't mean that a different program, or the same program in a different setting, may not be effective
- **Difficult to measure "general equilibrium" effects**
  - Do MFIs spur regional or national economic development

Challenges of not doing impact evaluation

- **Very expensive to spend resources on something that doesn't work**
- **Amount of money spend on interventions (hundreds of billions) vs. cost of evaluations (10s of millions)**

Digital Services and Evaluations

- **Can Religion be Used to Promote Repayment? (Burstzyn et al., 2016)**
  - Text messages to Indonesian credit card borrowers
  - Treatment: “The Prophet (Pease and blessings be upon Him) says “Non-repayment of debts by someone who is able to repay is an injustice. Your payment is due, please make a payment at your earliest convenience”
  - Control: “Your repayment is due. Please make a payment at your earliest convenience.”

Digital Services and Evaluations

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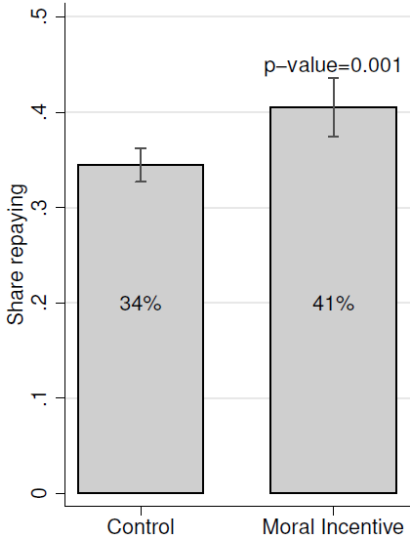

Reminders to Save

- **Large body of evidence that individuals face commitment problems: gym memberships, savings lock-boxes, etc.**
- **Can text messages promote saving?**
  - **Context: Bolivia, Peru, and the Phillipenes**
- **Results:**
  - **6% increase in savings (on average)**
  - **3.2% more likely to reach savings goal**
  - **(Evidence strongest in Bolivia)**
  - **No framing effects**

Conclusion

- **Randomized evaluations common and increasingly so**
  - Agronomic experiments
  - Medical trials
  - Business decision-making
  - A/B testing in Silicon Valley
  - Tamil Nadu government joint program with J-PAL
- **Digital financial services present unique opportunity to:**
  - Engage in constant experimentation to improve products
    - GoFundMe frustrated with PayPal
    - On one day, divert 10% of traffic to WePay
    - Next day, switched completely to WePay
  - Measure social impact of products
    - Example: Cooperation between firm and non-profit to evalaute advice services