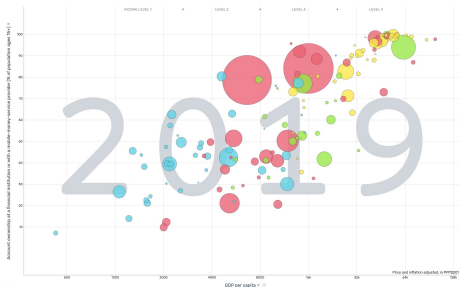1963: GNP/cap. vs. FIR (ratio of tot. financial
instrument value to wealth) (Goldsmith 1969)

2019: Financial account ownership vs. GDP/cap
(Gapminder, Findex, World Bank WDI)

Financial access and firm development: what does the recent evidence say?

Esther Duflo , MIT and College de France

STEG Lecture

Thank you to Emily Breza who put most of these slides together for the STIAS Nobel Symposium.

What Does Finance Do? (Levine 2005)

1. Mobilizes and Pools Savings
   - Overcomes costs of collection from many small households
   - Provides the trust to feel comfortable storing money at bank
2. Allocates capital, produces information ex ante about possible investments (screening), produces information ex post (monitoring)
3. Facilitates the trading, diversification, and management of risk
4. Facilitates temporal reallocation of consumption

- Problem: Many of these functions costlier/more difficult in development country settings
- Potentially wide-ranging and *heterogeneous* impacts on firms and HHs
   - Substantial body of research exploring barriers to expansion
   - And also work looking at impact on firms

Microcredit: Expanding and Refining Formal Credit Supply

Microcredit Rare Formal Product to Achieve Scale
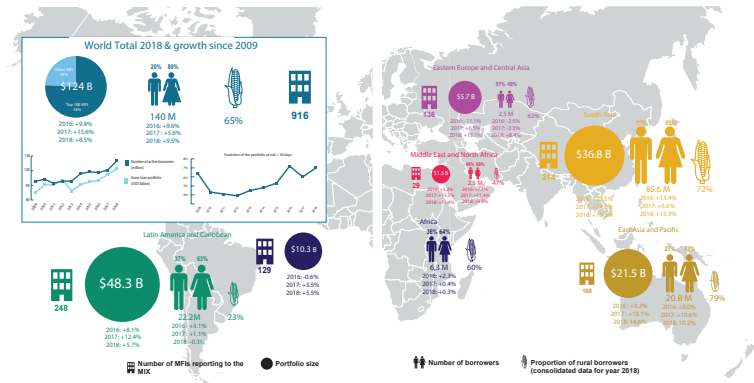
Source: Microfinance Barometer 2019

- Collateral-free loans targeted to women
- Many MFIs require loans be used for business purpose
- Low default rates indicate that microfinance has found a way to "solve" the moral hazard problem

Microcredit and "Gung Ho" Narrative

International Year of **Microcredit** 2005

**Building Inclusive Financial Sectors to Achieve
the Millennium Development Goals**

Microcredit and "Gung Ho" Narrative

- Discussion of "silver bullet" in fighting poverty
- Dominant narrative: "Gung-ho" entrepreneurship
  - Profitable business opportunities, scope for expansion
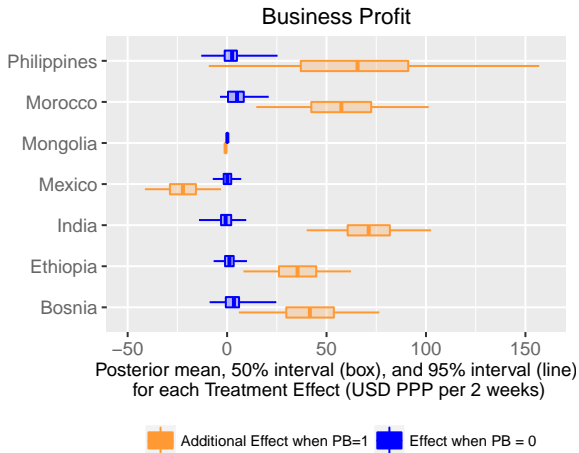 - Relaxing credit constraints may jumpstart firm growth

Returns to Microcredit?

Seven(!) RCTs launched by different researchers from 2005-2010:

Outcome	Bosnia and Herzegovina	Ethiopia	India	Mexico	Mongolia	Morocco
Business revenue	—	—	—	↑	—	↑
Business inventory/ assets	↑	no data	↑	no data	↑	↑
Business investment/ costs	—	—	↑	↑	no data	↑
Business profit	—	—	—	—	—	↑
Household income	—	—	—	—	—	—
Household spending/ consumption	—	↓	—	↓	↑	—
Social well-being	—	—	—	↑	—	—

Source: Hou

- Studies primarily set up to measure causal impacts of microfinance on businesses
- Modest impacts on investment, general nulls on profits
- Similar conclusions in formal meta-analysis Meager (2019, 2022 AER)
- Borrowers must be spending loans, but after 18 mos, no lasting business or consumption benefits

Does anyone benefit? Short run differences

Business Profit

Posterior mean, 50% interval (box), and 95% interval (line)
for each Treatment Effect (USD PPP per 2 weeks)

Additional Effect when PB=1   Effect when PB = 0

Source: Meager

Scope for Any Transformative Impacts?

Impacts likely heterogeneous for numerous reasons

- In India study, only 49.7% of MF borrowers have *any* business
  $\implies$ many borrow for **consumption**, not business growth.
- Among business owners, heterogeneous motives:
  - **"Gung-ho" entrepreneurs (GEs)**: scope and desire to scale
  - **"Reluctant" entrepreneurs (REs)**: business may be response to limited insurance, poor labor market prospects (Adhvaryu et al 2015, Breza et al (2021), microfinance may further induce **negative selection**

Banerjee et al (2023): 6 yr follow-up of MF RCT

- Proxy for GEs: pre-MF entrepreneurs who entered when cost of capital high

# Production, Transition Dynamics and Financial Inclusion

I: Possible wealth dynamics (concave production function)

W'

45°

$F(W)$

0 W^* W
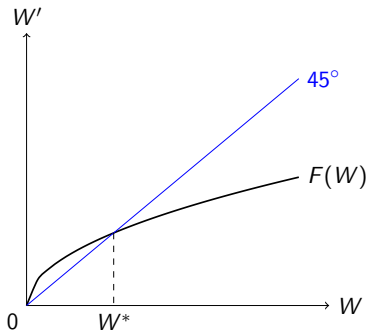
- Unique steady state, small optimal scale
- Financial access may help reach it faster, but benefits limited
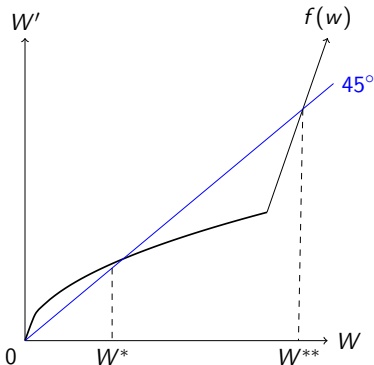- Model of REs?

Production, Transition Dynamics and Financial Inclusion

II: Alt. wealth dynamics (convex region in production frontier)
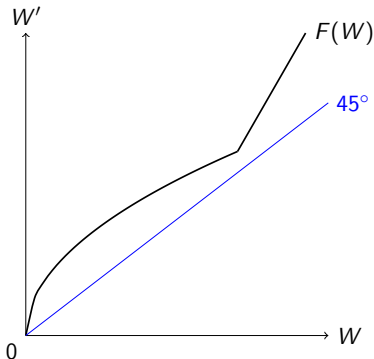
- No steady state
- Financial access → faster growth
- Generates persistent impacts of increased credit supply
- Model for GEs?

A poverty trap (III)

- Similar convex region in production frontier
- Where you start determines where you end up
- Temporary changes in financial access can push some households (and their businesses) onto a path to *permanently* higher incomes
- Model for GEs?

Production non-convexities and poverty traps

Key to Cases II and III: production non-convexities:

- Could arise from lumpiness in assets
- Need to invest to reach a higher level of productivity

Production non-convexities and poverty traps

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- Could arise from lumpiness in assets
- Need to invest to reach a higher level of productivity

Production nonconvexities, together with binding credit constraints, can *theoretically* generate a poverty trap (Dasgupta and Ray (1986); Banerjee and Newman (1993); Ahgion and Bolton (1997); Lloyd-Ellis and Bernhardt (2000))

- But rigorous empirical support for this idea in context of credit and entrepreneurship has been elusive (McKenzie and Woodruff (2006); Kaboski and Townsend (2011))
- Evidence complementary to ours: Balboni et al. (2022) [livestock]; Kaboski, Lipscomb, Midrigan, Pelnik (2022) [land purchases], Advani (2019) [network level pov traps]

Banerjee, Breza, Duflo and Kinnan (2024)

We analyze the *long-run* impacts of the India RCT that introduced microfinance to neighborhoods across Hyderabad.

- MFI Spandana entered 52 of 104 neighborhoods **(treatment)** at t_1
- Spandana entered remaining neighborhoods **(control)** at $t_1 + 2$
- Andhra Pradesh (AP) ordinance outlawed microfinance at $t_2 = t_1 + 4$
- New followup data collected at $t_3 = t_1 + 6$

Any effects seen at t_3 reflect *persistent* effects of *past* MF access

Eyeball evidence of non-convexities
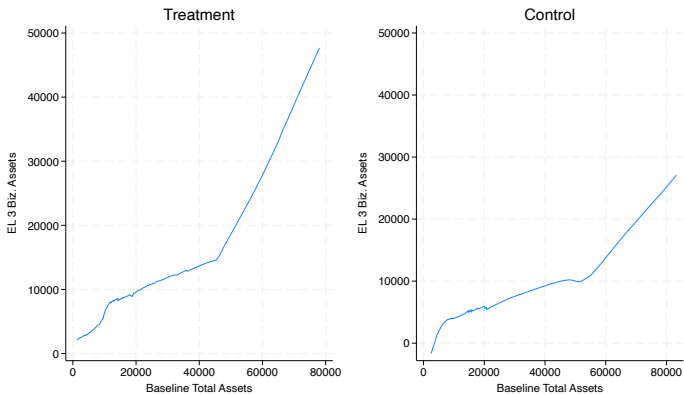
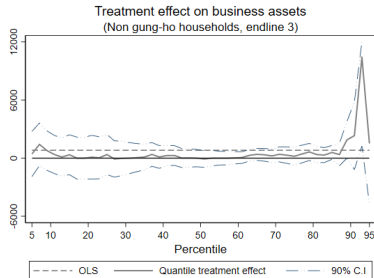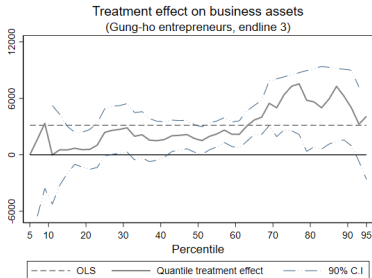Leftward shift in the kink in the initial assets - EL3 assets mapping

Results summary

(Past) additional access to microfinance $\Rightarrow$ large effects *for those who started their business before MF entered* (gung-ho entrepreneurs):

- Investment increases throughout the distribution
- Profits increase *on average*, driven by top $1/3$
- Non-business durables increase
- Consumption increases for middle 50%

No effects ($+$ or $-$) for those who entered entrepreneurship later.

Business Assets

Treatment effect on business assets
(Gung-ho entrepreneurs, endline 3)

Treatment effect on business assets
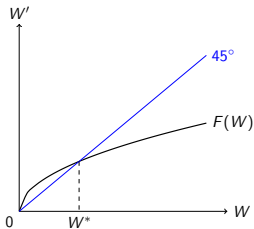(Non gung-ho households, endline 3)

- GEs (left): increase in biz assets throughout distribution
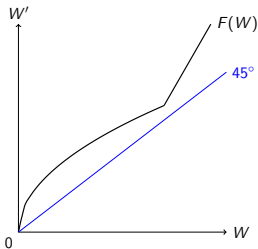- non-GEs (right): no effect, except maybe in the right tail

Results: Business Profits
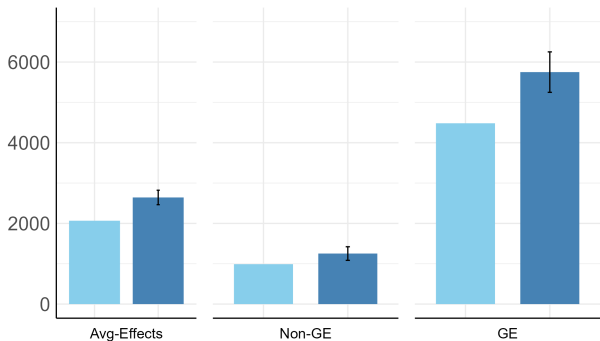
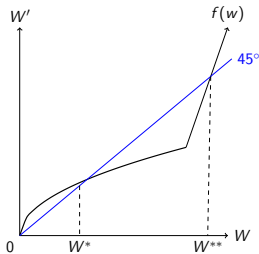- Large significant increase in long-run profits for GEs only

I: Concave prod. function

II: Non-convexity, no pov. trap

III: Non-convexity, poverty trap

- II, III can both deliver persistent $\uparrow$ in business outcomes
- Informal borrowing impacts can help distinguish cases
    - II: always prefer to exhaust credit supply, no effect of MF on informal credit
    - III: HHs stuck in trap might borrow less than credit limit if can't get out of the trap. Entry of MF can *crowd in* borrowing.

Credit Impacts

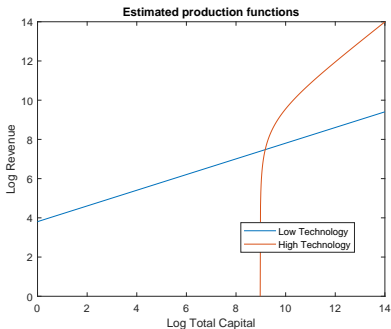|	(1) Borrowed from MFI in last 3 years (EL1 1)	(2) Borrowed from MFI between 2004-10	(3) Outstanding MFI loan (EL 2)	(4) Total MFI loan amt (EL2)	(5) Informal credit (EL3)
Exposure to credit by entrepreneurial status					
Treatment	0.109***	0.036	0.003	677.234	-1683.957
	(0.021)	(0.026)	(0.021)	(508.180)	(4226.917)
Treatment × GE	-0.002	0.020	0.013	754.962	14085.007*
	(0.030)	(0.032)	(0.031)	(929.289)	(7387.176)
Gung-ho entrepreneur (GE)	0.163***	0.110***	0.093***	2557.957***	3647.067
	(0.023)	(0.022)	(0.020)	(671.712)	(5833.084)
Treatment + Treat × GE	0.107	0.057	0.016	1432.197	12401.050
P(Treat + Treat × GE ≠ 0)	0.001	0.091	0.617	0.102	0.046

Col (5): Substantial crowd-in of informal credit for GEs

- Inconsistent with Case II, suggestive of poverty trap*

*Note: can alternately generate empirical patterns with non-convexity, interest rate wedge

What drives patterns for GEs? Simple structural exercise

Step 1: estimate production function

Estimated production functions

(Plot axes: Log Revenue vs. Log Total Capital; legend: Low Technology, High Technology)

Revenues cross at $K = 9,414$.

- Profitable to switch at $K = 13,500$ if opportunity cost is saving

- Switch at 18,500 if borrowing

Technologies:

$$Y_L(K) = A_L K^\alpha$$
$$Y_H(K) = A_H(K - \underline{K})$$

Estimated parameters:

$$A_L = 45$$
$$\alpha = 0.4$$
$$A_H \equiv 1$$
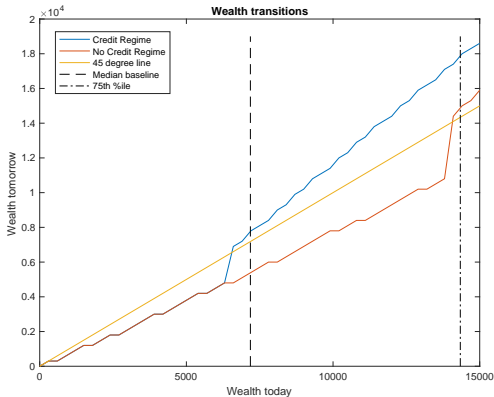$$\underline{K} = 7,900$$

Step 2: Wealth Policy Function

Estimated production function parameters consistent with a poverty trap!

- Wealth policy function S-shaped, crosses 45° line from below 73% of treatment effect is from unlocking poverty trap, 27% from allowing businesses on growth path to keep expanding

What drives patterns for non GEs?

The non-GEs show essentially no effect on assets, profits. Why?

MF has two offsetting effects

- a modest positive treatment effect
- a negative selection effect

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- businesses who entered entrepreneurship post-2006, pre-MF (no selection) $\Rightarrow$ **.148 standard deviation treatment** effect on business outcomes index ($p < .05$)

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- businesses who entered entrepreneurship post-2006, pre-MF (no selection) $\Rightarrow$ **.148 standard deviation treatment** effect on business outcomes index ($p < .05$)
- businesses who entered entrepreneurship post-2006, post-MF (no selection) $\Rightarrow$ -**.183 standard deviation selection + treatment** effect on business outcomes index ($p = 0.102$)

Discussion

Some—but not all—households face poverty-trap dynamics due to production non-convexities

- credit access, even in the short term, can help these households pay the fixed cost and escape the poverty trap
  - response of *informal* credit is key to understanding the overall impact
- but other households face other constraints (managerial ability, etc.)
  - and cannot transition to the "better" technology
- this heterogeneity makes it challenging to identify the fixed cost-based poverty trap empirically
- need to consider heterogeneity — and formal-informal interactions

Policy Implications

Borrowers are not monolithic, have heterogeneous goals:

- Credit as a way to finance entrepreneurship
- Credit as a way to consume sooner

Microfinance typically does not attempt to distinguish between these two groups.

- Screening technologies can be expensive
- Homogeneous contracts (e.g., loan size, payment structure) allow MFIs to economize on costs
- Contracts that limit risk-taking improve repayment

Refinement 1. Directing Credit to High-Return Bus.

- Bryan Karlan and Osman (2022): Large loans to businesses
  - Treatment: 4x typical loan size. Control: 2x typical loan size
  - Top quartile: ↑ 56% profits. Bottom quartile: ↓ 52% profits
  - Consistent with substantial misallocation
- Bari et al (2024, AER): Asset-based fin. for successful MF clients
  - Status quo (control): $500 microloan [30% take-up]
  - Hire-pay contract (treatment): asset purchase up to $2,000, 10% down, rent-to-own payments over 18 mos. [50% take-up]

Business total fixed assets — Business profits
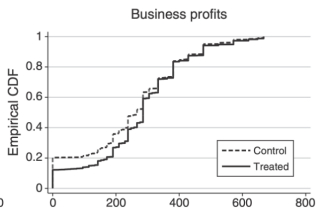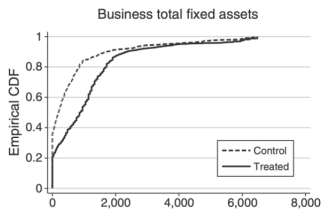
- Significant ↑: consumption, assets, education expenditure

Refinement 2. Prospects for Segmentation

- Self-selection: Beaman et al (2023 ECTA)
  - How about more choices? Better savings/insurance?

- Peer selection: Hussam et al (2022 AER), study with 1,345 microentrepreneurs, lottery to receive $100 grant
  - *Who could grow their profits most if they received grant?*
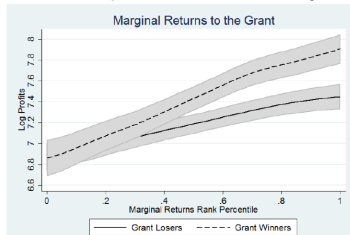
Source: Hussam, Rigol and Roth 2022

- Alternate data sources (will return to this below)
  - Bryan et al (2022) Large loans study: Psychometric chars. predictive of TEs

Refinement 3. Designing for Needs of Business

Flexibility: ↑ Profits in 4 out of 5 studies

	Country	Innovation	Profits	Income	Default
Karaivanov et al.(2020)	India	Repay Whenever	↑ 15% (INR 125) daily	-	-
Barboni et al. (2023)	India	Deferral Option	↑ (INR 5241) monthly	-	-
Battaglia et al.(2021)	Bangladesh	Deferral Option	↑ 27 % (USD 97) monthly	↑ 17% (USD 1,309) annualy	↓ 35%
Brune et al.(2022)	Colombia	Deferral Option	-	-	↓ 5%
Field et al.(2013)	India	Grace Period	↑ 41 % (INR 641) weekly	↑ 19.5% monthly	↑ 213-372%

Source: Hou, M., 2023. Microcredit: Impacts and promising innovations

Products that match timing of need/CFs have had success
- Farmer loans during hungry season (Zambia Fink et al 2020, AER); Loans to delay sale of maize harvest (Kenya Burke et al 2019 QJE); Agricultural loans (Mali Beaman et al 2023 ECTA)

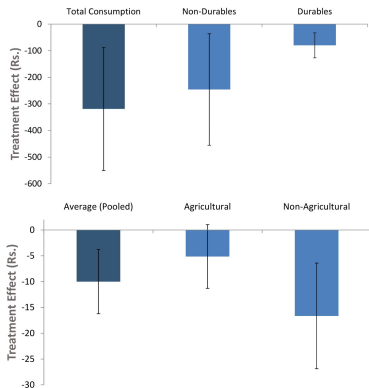# 4. General equilibrium Impacts and Rural Labor Markets

Breza and Kinnan (2021, QJE)

Potential GE impacts of MF:

- Business growth, job creation
- Consumption from MF loans → Aggregate demand

Natural experiment: Withdrawal of credit

- Equilibrium Outcomes:
  - Wages fall by 4%, ↓↓non-tradable wage
  - Consumption falls by 5%, Consumption multiplier > 2

Small loans to rural HHs can move the local economy, need for stable regulation

5. GE Impacts and Social Networks
Banerjee et al 2024, ReStud

How does MF change network?

- Data from 2 "experiments"
- Detailed social networks
  (Banerjee et al 2014, Science)

Are there impacts even for non-takers?

- Classify each HH into High (H) vs. Low (L) propensity borrower

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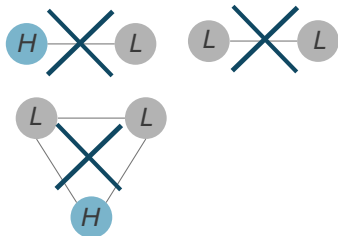
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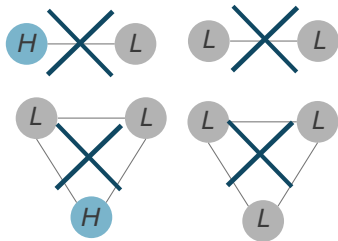
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  borrower

Ls experience worse consumption smoothing, ↑corr(inc,cons)

- Implications for credit policy. Direct credit toward places with
  less network-based credit. Bring better insurance to Ls

Moving from there

- Banks: Banks not good at reaching small firms and poor households, but have large impacts, and even medium /large firms are credit constrained (Banerjee and Duflo)
- Finance at inflexion point with digitization: wide open research space
- Impacts of new digital world on productive lending (and hence growth)? So far research on consumption loans.