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INNOVATIVE FINANCING USING MICROEQUITY CONTRACTS: EVIDENCE FROM AN ONGOING EXPERIMENT IN INDIA

RESEARCH CONFERENCE ON ACCELERATING GROWTH FOR WOMEN-LED SMES

Sanghamitra Warrier Mukherjee International Monetary Fund

(with Muhammad Meki, Karthik Narayan, and Simon Quinn)

The views expressed herein are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

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A statement from our funder – USAID



This research was conducted with support and assistance from American People through the U.S. Agency for International Development's Development Innovation Ventures Program. The information provided in this presentation is not official U.S. Government information and does not represent the views or positions of the U.S. Agency for International Development or the U.S. Government.

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Constraints to productive investments

Desian

Informal microenterprises in low and middle income countries (LMICs) are characterized by low growth and profitability.

Two big solutions have been explored to enhance business performance and improve key livelihood indicators:

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Constraints to productive investments

Design

Informal microenterprises in low and middle income countries (LMICs) are characterized by low growth and profitability.

Two big solutions have been explored to enhance business performance and improve key livelihood indicators:

1. Large grants to microenterprises have large and persistent increases (De Mel et al., 2008; Bandiera et al., 2017).

A key drawback is the limited sustainability as grants do not allow the money to be redeployed to other firms (Bari et al., 2021).

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Constraints to productive investments

Design

Informal microenterprises in low and middle income countries (LMICs) are characterized by low growth and profitability.

Two big solutions have been explored to enhance business performance and improve key livelihood indicators:

- 1. Large grants
- 2. Access to microcredit has mixed evidence on the sustained impact of microcredit on microenterprise profits and key livelihood indicators. (Banerjee et al., 2015).

A key drawback is that rigid repayment requirements limit a firm's ability to channel money to lumpy assets. (Field et al., 2013).

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Constraints to productive investments

Informal microenterprises in low and middle income countries (LMICs) are characterized by low growth and profitability.

Two big solutions have been explored to enhance business performance and improve key livelihood indicators:

- 1. Large grants
- 2. Access to microcredit

 \Rightarrow Can we enhance business performance and improve key livelihood indicators, while also recouping the initial investment amount for future investments?

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This paper

Desian

Research question: Can a big-push microequity contract generate sustained improvements in business performance and household welfare, while also recouping the initial investment amount for future investments?

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This paper

Research question: Can a big-push microequity contract generate sustained improvements in business performance and household welfare, while also recouping the initial investment amount for future investments?

Setting: We work with women-led microenterprises in rural and peri-rural areas in India.

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This paper

Research question: Can a big-push microequity contract generate sustained improvements in business performance and household welfare, while also recouping the initial investment amount for future investments?

Setting: We work with women-led microenterprises in rural and peri-rural areas in India.

What we do: We run a field experiment where we randomise the offer of large microequity financing (about 11 times the average monthly revenue) to finance productive assets and working capital.

• We provide no additional financing to the control group.

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What do we mean by microequity?: Microequity financing (or "equity-like microfinancing") allows for performance-contingent repayments through revenue sharing for a fixed duration.

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What do we mean by microequity?: Microequity financing (or "equity-like microfinancing") allows for performance-contingent repayments through revenue sharing for a fixed duration.

Small N and Large T: We work intensively with a small sample of firms and collect high frequency daily data over a long time horizon (Bloom et. al., 2009, McKenzie, 2012).

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What we find (27 months into a three year intervention)

High take-up:

- 1. We document high demand for microequity contracts in the selected sample.
- 2. All firms demand the maximum microequity financing amount of Rs. 100,000 (USD 1200) .

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High take-up:

- 1. We document high demand for microequity contracts in the selected sample.
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Sustained improvements in business performance:

- 1. We find a 47% increase in fixed assets and a 123% increase in inventories (stable over time).
- 2. We see a 63% and 60% increase in weekly revenues and profits (stable over time).

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Recouping the initial investment amount:

- 1. We observe no missed repayments (yet).
- 2. We document broadly accurate reporting of revenues.

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Contributions

Desian

• Banerjee et al., 2015 highlight the need to explore innovations to conventional microcredit contracts (Banerjee et al., 2015; Gamba and Triantis, 2008; Field et al., 2010; Bari et al., 2021; Battaglia et al., 2021).

 \Rightarrow We allow for performance contingent repayments and document improvements in business and household outcomes, while maintaining low rates of default.

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Contributions

Design

• Banerjee et al., 2015 highlight the need to explore innovations to conventional microcredit contracts (Banerjee et al., 2015; Gamba and Triantis, 2008; Field et al., 2010; Bari et al., 2021; Battaglia et al., 2021).

 \Rightarrow We allow for performance contingent repayments and document improvements in business and household outcomes, while maintaining low rates of default.

• The literature on microinsurance products finds evidence of low take-up rates even when heavily subsidised (Cole et al., 2013).

 \Rightarrow We document high take-up and compliance for microequity products, which unlike a conventional insurance product, has less "binary" downside risk sharing.

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Contributions

Desian

In the absence of fully functional financial markets in LMICs, relational contracts (and credible threats) play a major role (McMillan and Woodruff, 1999; Banerjee and Duflo, 2000; Antras and Foley, 2015; Macchiavello and Morjaria, 2015; Macchiavello et al., 2015; Kleven et al., 2011, 2016; Brockmeyer et al., 2019; Slemrod et al., 2001; Pomeranz, 2015; Perez-Truglia and Troiano, 2018).

 \Rightarrow We highlight the opportunities relational contracts might create in innovations to conventional microcredit contracts.

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Partner organisations

Design

Buzz Women: Working with over 200,000 women they aim to empower entrepreneurs in Karnataka by providing access to training, financial knowledge, credit and support systems.

Yunus Social Business (YSB): They are a prominent nonprofit financing institution who fund over 17 million people in East Africa, Latin America and India. In Karnataka, they fund over 3.2 million low income customers.

Sample

Desian

- 1. Representative of the average women-led firm in the region:
 - The sample comprises of 28 informal women led micro-firms in the Bangalore and Tumkur districts of Karnataka in India.
 - Firms are drawn from two sectors of particular relevance for rural and peri-rural areas: (i) animal husbandry and (ii) tailoring.

Sample

- 1. Representative of the average women-led firm in the region:
- 2. Established "micro" enterprises:

Desian

- · The average firm has no employees.
- The average firm earned monthly profits of Rs. 7,500.
- The average entrepreneur has over 10 years of experience.

Sample

- 1. Representative of the average women-led firm in the region:
- 2. Established "micro" enterprises:

Desian

- 3. The business profits form a significant share of household income:
 - The average household has a total monthly income of Rs. 27,000.
 - The average household has 2.4 members who earn any form of income.
 - The average household runs two businesses.

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Sample

- 1. Representative of the average women-led firm in the region:
- 2. Established "micro" enterprises:

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- 3. The business profits form a significant share of household income:
- 4. Firms have volatile revenues:



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Results 00000000000000

Design

Intervention: Participants were randomised into two treatment arms:

- 1. The control group (13) continued to receive business as usual support from Buzz Women.
- 2. The treatment group (15) was offered a take-it-or-leave-it opportunity to receive microequity financing.

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Design

Intervention: Participants were randomised into two treatment arms:

- 1. The control group (13) continued to receive business as usual support from Buzz Women.
- 2. The treatment group (15) was offered a take-it-or-leave-it opportunity to receive microequity financing.

Randomisation: At the individual level and stratified based on the sector.

- 1. Animal husbandry (21): We further stratify on above and below median of monthly business revenue (three month average) earned by the firm
- 2. Tailoring (7): We do not further stratify on above and below median revenue, as the sample size is too small here.

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Microequity contract

Desian

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Maximum amount offered: Rs. 100,000 (70% on assets and 30% on inventories).

- + $\,\approx$ 11 times their average monthly revenue.
- + $\,pprox$ 3.5 times the average loan taken.
- + $\,\approx$ 1.4 times their average fixed assets

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Microequity contract

Design

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- + $\,\approx$ 3.5 times the average loan taken.
- + $\,\approx$ 1.4 times their average fixed assets

Duration: 36 month contract with a three month grace period.

Monthly repayments: (i) a fixed payment of Rs. 1,000; and (ii) a flexible payment of 15% of the monthly revenue for the duration of the contract.

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Microequity contract

Design

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Duration: 36 month contract with a three month grace period.

Monthly repayments: (i) a fixed payment of Rs. 1,000; and (ii) a flexible payment of 15% of the monthly revenue for the duration of the contract.

Liability type: Individual liability

Deposit: No financial deposit was required

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Sample selection

1. We identified entrepreneurs using the local knowledge of Buzz staff.

Number of firms: 200 Timeline: 2019

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Sample selection

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- 1. We identified entrepreneurs using the local knowledge of Buzz staff.
- Entrepreneurs remained in the sample if they invested time in the project.
 Number of firms: 55
 Timeline: Mid-2019 to September 2021

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Sample selection

Desian

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- 1. We identified entrepreneurs using the local knowledge of Buzz staff.
- 2. Entrepreneurs remained in the sample if they invested time in the project.
- Entrepreneurs who were interested in microequity applied for financing.
 Number of firms: 43

Timeline: October to December 2021

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Sample selection

Desian

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- 1. We identified entrepreneurs using the local knowledge of Buzz staff.
- 2. Entrepreneurs remained in the sample if they invested time in the project.
- 3. Entrepreneurs who were interested in microequity applied for financing.
- 4. YSB selected entrepreneurs who met their lending criteria. **Number of firms:** 28

Timeline: December 2021 to April 2022

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Data					

		1	Pre-	Inte	rvei	ntio	n									Po	ost Int	erv	enti	ion							_
		2021 203					2022	22 2023									2024						2025				
Daily financial data	F	M A M J	J A	S C	N D	J F	M	A M	1 1	A	SON	N D	JF	MAN	I I	AS	5 O N	I D	FM	AM	1 1	AS	5 O N	D	J F	MAM	A L L
Short phone survey											Δ		Δ	Δ	Δ		Δ	Δ		Δ	Δ	2	Δ		Δ	Δ	Δ
Repayments																											
Monitoring																											
Detailed field survey					Δ												Z	7									Δ

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Estimation of treatment effects

Design

We estimate using ANCOVA and use randomisation inference.

$$Y_{ir} = \beta_0 + \beta_1 \cdot T_i + \beta_2 \cdot Y_{i0} + \gamma_r + \omega_s + \varepsilon_{ir},$$

We cluster at the firm level, and re-sample according to the underlying stratification scheme.

For direct measures of business performance, we also exploit the large time series of around 52 rounds of weekly pre-intervention data and the rounds of weekly post-intervention data.

assets					
	Fixed assets			Current assets	
	(1)	(2)	(3)	(4)	(5)
	Total	Total	Cash	Accounts receivable	Inventories
Treatment	62.0*	-0.3	1.3	-5.7*	2.6**
	(32.2)	(5.0)	(1.3)	(3.3)	(1.0)
Observations	152	152	152	152	152
Number of firms	28	28	28	28	28
Mean Dependent Variable	131.3	19.5	6.8	8.8	2.2
SD Dependent Variable	125.6	25.5	6.8	18.9	1.9
P value RI test	0.08	0.95	0.30	0.05	0.05
P value KS test	0.03	0.16	0.34	1.00	0.00

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Firm finances

	(1)	(2)	(3)
	Revenue	Expenditure	Profit
Treatment	1.4**	0.4*	0.9**
	(0.6)	(0.2)	(0.4)
Observations	3304	3304	3304
Number of firms	28	28	28
Mean Dependent Variable	1.7	0.7	1.1
SD Dependent Variable	2.4	1.0	1.8
P value RI test	0.04	0.10	0.02
P value KS test	0.00	0.00	0.00

Notes: All values are in '000 Rs.

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Revenue



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Revenue



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Results on business performance

Business performance:

- 1. **Increase in assets:** We find a 47% increase in fixed assets and a 123% increase in inventories.
- 2. Increase in revenues and profits: We see a 63% and 60% increase in weekly revenues and profits respectively.
- 3. **Treatment effects persist over time:** The high frequency daily financial data allows us to document how the treatment effects evolve.
- 4. Increases across the distribution: We observe a clear shift of the CDFs to the right.
- 5. No significant effects on employment: We do not see a significant effect on paid or unpaid employment.

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Results on repayments

Desian

There are two measures we are interested in:

- 1. Repayment amounts: Do firms pay the amount due at the end of the month?
- 2. Monitoring slippage: Do firms under-report their revenues?

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Repayment amounts



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Repayment amounts



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Repayment amounts



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Monitoring slippage

In an informal economy, we cannot perfectly observe revenues and state verification is costly.

Self reports are verified using:

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Monitoring slippage

In an informal economy, we cannot perfectly observe revenues and state verification is costly.

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Desian

1. Visits from secret shoppers (with permission obtained from all participants in advance).



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Desian

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- 2. For animal husbandry, using receipts from the dairy.



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Monitoring slippage

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Self reports are verified using:

Desian

- 1. Visits from secret shoppers (with permission obtained from all participants in advance).
- 2. For animal husbandry, using receipts from the dairy.
- 3. For tailoring, using motion sensors for a subset of automatic sewing machines.

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Cost benefit analysis

Desian



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Other questions

Desian

1. What types of firms is microequity suited for?

- Do "high-type" or "low-type" firms select into micro-equity contracts?
- Do "risk-averse" or "risk-loving" firms select into micro-equity contracts?
- We are considering running a lab-in-field experiment to get at these questions.

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Design

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- Do "high-type" or "low-type" firms select into micro-equity contracts?
- Do "risk-averse" or "risk-loving" firms select into micro-equity contracts?
- We are considering running a lab-in-field experiment to get at these questions.

2. Scaling-up:

- How does microequity compare with microcredit?
- · Records of digital transactions can reduce monitoring cots substantially.



We are two-third of the way through repayment period, and are interested in exploring the policy implications that may follow if the repayment patterns continue.

Policy implications

Design

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1. Growth of women led microenterprises: This paper presents evidence of a large and sustained growth in women led microenterprises in contrast to the microfinance literature that has found limited evidence of business growth for women led microenterprises (De Mel et al., 2008; Attanasio et al., 2015; Fiala, 2018).

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- 2. Immense potential and interest from policy partners to scale-up: Microenterprises (enterprises with fewer than 10 employees) account for over 97.88% of the population of firms (Hsieh and Olken, 2014).

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Determining sharing ratios

Design

The terms of the microequity financing contract was calculated by comparing it to the terms of a standard debt contract in the region.

The standard contract we considered is a three year contract with a 15% interest rate (compounded annually).

Our partner, YSB wanted to recover 30% of the principal in fixed payments. So we fixed the fixed payments to Rs. 1000 per month for a period of 33 months.

To compute the revenue sharing ratio for the flexible payments, we projected revenues for firms in our sample and computed the sharing ratio required for our contract to closely resemble the total payments made in a standard debt contract.

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Expenditure



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Expenditure



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Profit



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Profit



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Cumulative repayment



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Repayment for average firm

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Repayment by sector

