

Targeting of Agricultural Credit Programs: Private Agents v. Local Governments

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Motivation

- Debate about centralized v. decentralized governments
- local governments have better information & incentives than central bureaucrats
- but decentralization is not a panacea (WDR 2004, Mansuri & Rao 2013)
 - local govts. subject to elite capture
 - low competence & training
- a third alternative: to use local but private agents
- private agents may have their own agendas
- but with judicious mechanism design can one curb those problems?
- education & health: privatization as an alternative to state-run

Agent-Intermediated Lending (AIL)

- We conduct a field experiment where such a method is used to select borrowers for agricultural credit
- AIL: an agent from the local community is asked to recommend borrowers to an outside lender
- ...through commissions that depend on repayments
- The agent may
 - select borrowers on their type/creditworthiness
 - monitor borrowers' actions/repayment behaviour
 - provide technical/other assistance to borrowers

Characteristics/Incentives of the Agent

- Trader-Agent-Intermediated Lending (TRAIL)
 - agent is a trader/shopkeeper with a history of economic relationships within the community
- *Gram Panchayat*-Agent-Intermediated Lending (GRAIL)
 - agent is selected by local government
 - embedded within the community
 - likely to have political connections/motivations

Goal of this project

- Effects of the loans on borrower outcomes
- Borrower selection patterns
- Effect of GRAIL loans on political support for agent's party
 - ...which in turn may affect selection

Experimental Setting

- Two potato-growing districts: Hugli & West Medinipur
 - TRAIL scheme: 24 villages
 - GRAIL scheme: 24 villages
 - (GBL scheme: 24 villages)
- Experiment lasted 8 4-month cycles over the period: Sept 2010 - July 2013

The Agent-Intermediated Lending Scheme

- Agent recommends 30 landless or marginal landowners (≤ 1.5 acres)
 - subset of these are chosen randomly to receive offer of individual liability loans
- Agent plays no further role:
 - MFI sets loan terms, directly lends to and collects repayments from borrowers
- No group meetings, savings requirements or gender restrictions

Loan Features

- Loan interest rate pegged below average rates on informal credit
- Dynamic borrower incentives
 - start with small loans
 - future credit access grows at fast rate based on current repayment
- *Loan durations/timing: 4 months, match key-crop cycles
- *Insurance against covariate (price-yield) risks
- *Doorstep banking, no bank accounts

(*: non-standard)

Agents & Their Incentives

- TRAIL: agent is randomly drawn from list of established traders/shopkeepers
- GRAIL: local government council chooses the agent
- Agent's incentives:
 - forfeitable deposit (= 2.5% of first loan amount)
 - commission = 75% of interest payments received from borrowers
 - termination if $\geq 50\%$ of borrowers defaulted
 - paid holiday at the end of 2 years in the scheme

Agent Characteristics

	GRAIL (1)	TRAIL (2)	Difference (3)
Male	1.00 (0.00)	0.958 (0.042)	0.042 (0.042)
SC/ST	0.208 (0.085)	0.083 (0.058)	0.125 (0.102)
Non-Hindu	0.125 (0.069)	0.083 (0.058)	0.042 (0.090)
General caste	0.667 (0.098)	0.833 (0.078)	-0.167 (0.125)
Occupation: Cultivator	0.375 (0.101)	0.042 (0.042)	0.33*** (0.109)
Occupation: Shop/business	0.292 (0.095)	0.958 (0.042)	-0.667*** (0.104)
Occupation: Government job	0.125 (0.690)	0.000 (0.000)	0.125* (0.690)
Owned agricultural land	2.63 (0.198)	3.29 (0.244)	-0.667** (0.314)
Total owned land	4.08 (0.248)	5.04 (0.292)	-0.958** (0.383)
Has <i>pucca</i> house	0.375 (0.101)	0.458 (0.104)	-0.083 (0.145)
Educated above primary school	0.958 (0.042)	0.792 (0.085)	0.167* (0.094)
Weekly income (Rupees)	1102.895 (138.99)	1668.75 (278.16)	-565.855 (336.78)
Village society member	0.292 (0.095)	0.083 (0.058)	0.208* (0.111)
Party hierarchy member	0.167 (0.078)	0.000 (0.00)	0.167** (0.079)
Panchayat member	0.125 (0.069)	0.000 (0.00)	0.125* (0.069)
Self/family ran for village head	0.083 (0.058)	0.000 (0.00)	0.083 (0.058)

Randomisation Check

	TRAIL (1)	GRAIL (2)	GBL (3)	TRAIL-GRAIL (4)	TRAIL-GBL (5)	GRAIL-GBL (6)
Head: More than Primary School	0.407 0.015	0.420 0.015	0.433 0.015	-0.013	-0.026	-0.013
Head: Cultivator	0.441 0.015	0.415 0.015	0.437 0.015	0.026	0.004	-0.022
Head: Labourer	0.340 0.015	0.343 0.015	0.323 0.015	-0.003	0.017	0.02
Area of house and homestead (Acres)	0.052 0.001	0.052 0.002	0.054 0.002	0.000	-0.002	-0.002
Separate toilet in house	0.564 0.015	0.608 0.015	0.552 0.015	-0.044	0.012	0.056
Landholding (Acres)	0.456 0.013	0.443 0.013	0.473 0.013	0.013	-0.017	-0.03
Own a motorized vehicle	0.124 0.010	0.126 0.010	0.129 0.010	-0.002	-0.005	-0.003
Own a Savings Bank Account	0.447 0.015	0.475 0.015	0.446 0.015	-0.028	0.001	0.029
F-test of joint significance (p-value)				0.996	0.994	0.976

Design and Sample

- In each scheme
 - In each village, the agent recommends 30 borrowers...
 - ...and the lender offers the loans to a *randomly chosen subset* of 10 individuals (Treatment, T)
 - 10 recommended but not chosen to receive the loans are Control 1 (C1)
 - 30 of those not recommended are sampled & called Control 2 (C2)

Average Treatment Effects

$$\begin{aligned}
 y_{ivt} = & \beta_0 + \beta_1 \text{TRAIL}_v + \beta_2(\text{TRAIL}_v \times \text{Treatment}_{iv}) + \beta_3(\text{TRAIL}_v \times \text{Control } 1_{iv}) \\
 & + \beta_4(\text{GRAIL}_v \times \text{Treatment}_{iv}) + \beta_5(\text{GRAIL}_v \times \text{Control } 1_{iv}) \\
 & + \beta_6(\text{GBL}_v \times \text{Treatment}_{iv}) + \beta_7(\text{GBL}_v \times \text{Control } 1_{iv}) \\
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- Run on households with ≤ 1.5 acres of land in TRAIL, GRAIL & GBL villages
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 - TRAIL: $\beta_2 - \beta_3$
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 - GBL: $\beta_6 - \beta_7$

Average Treatment Effects

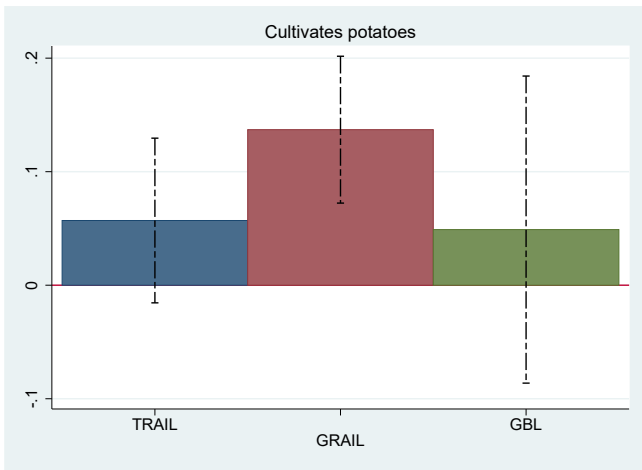
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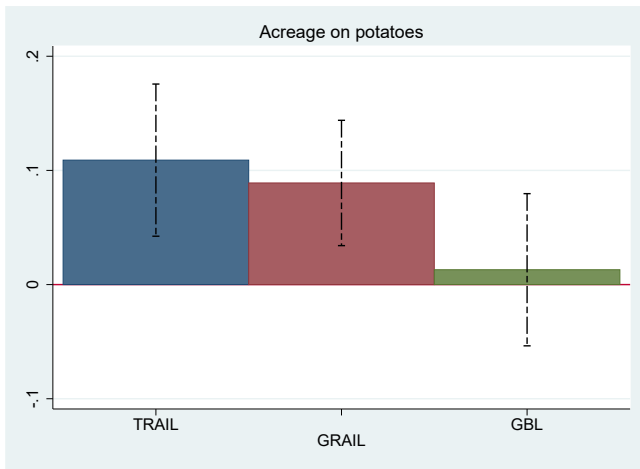
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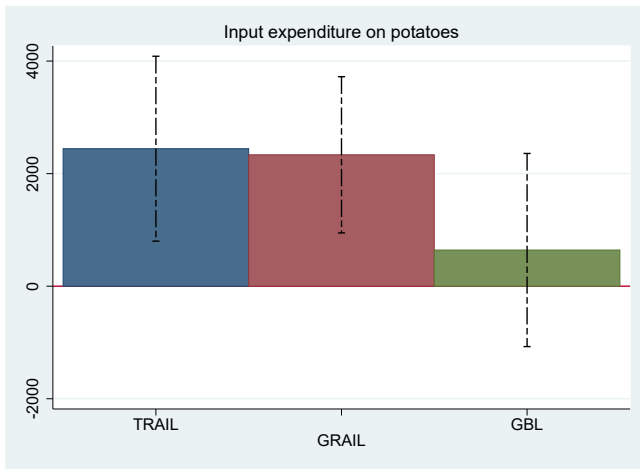
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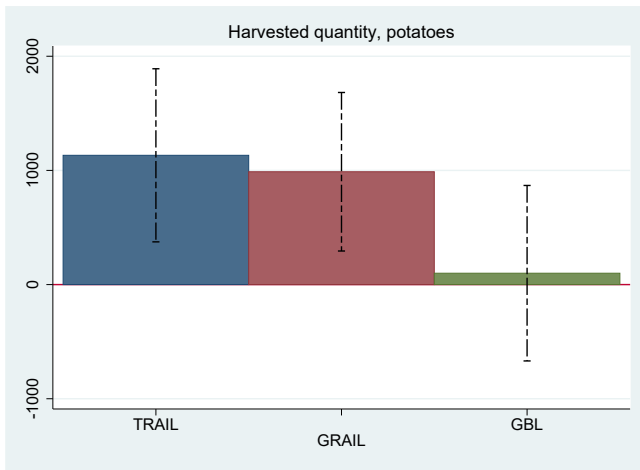
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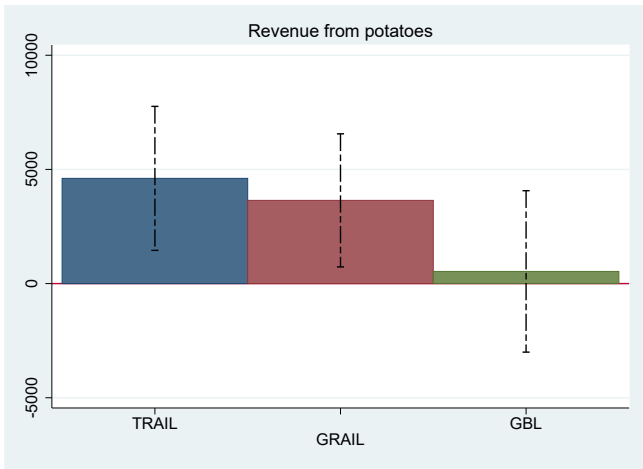
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- Standard errors clustered at the para level to account for spatial correlation

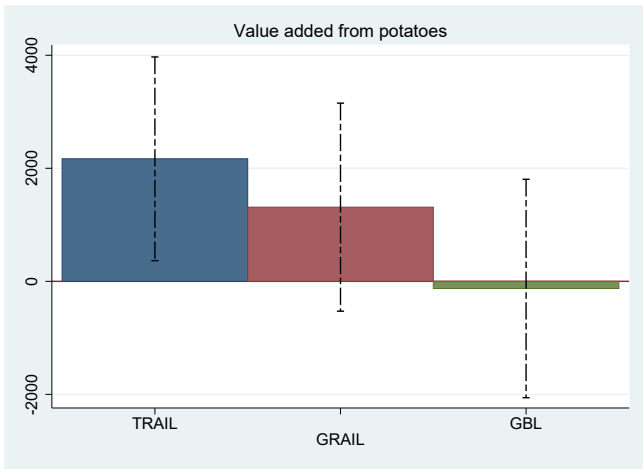


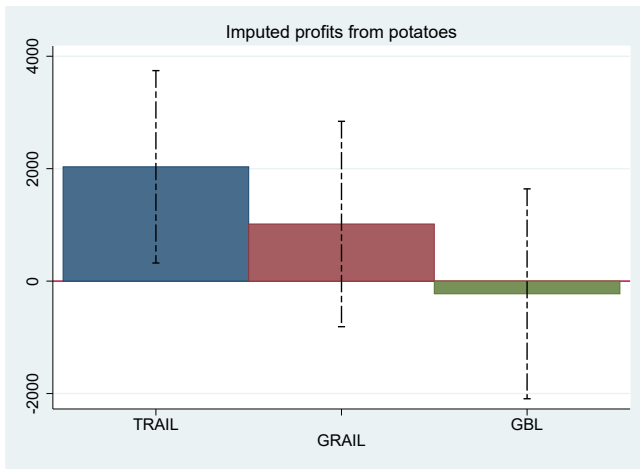


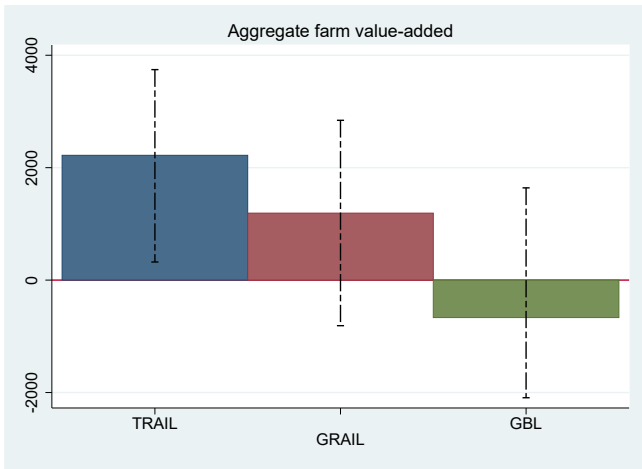












Differences in Average Treatment Effects

	Cultivate (1)	Acreage (2)	Cost (3)	Output (4)	Revenue (5)	Value-added (6)	Imputed profits (7)	Farm value-added (8)
TRAIL v. GRAIL	-0.08*** (0.049)	0.020 (0.045)	144.016 (529.90)	108.627 (1106.66)	964.117 (2212.50)	855.865 (1326.15)	1017.300 (1288.69)	1028.47 (1561.28)
GRAIL v. GBL	0.088 (0.08)	0.075* (0.04)	888.61* (528.93)	1691.69 (1127.68)	3111.67 (2338.26)	1439.25 (1359.85)	1241.57 (1329.78)	1858.04 (1694.43)
TRAIL v. GBL	0.008 (0.078)	0.096** (0.048)	1032.62* (548.827)	1800.32 (1207.30)	4075.79* (2412.28)	2295.11* (1347.80)	2258.88* (1291.81)	2886.52* (1559.30)

Loan Performance

Loan Performance

Table: Performance of Loans

Sample Means	Repayment (1)	Take up (2)	Continuation (3)
TRAIL	0.958 (-0.005)	0.856 (-0.008)	0.805 (-0.009)
GRAIL	0.943 (-0.007)	0.725 (-0.011)	0.672 (-0.011)
GBL	0.954 (0.006)	0.746 (0.011)	0.691 (0.011)
TRAIL v. GRAIL	0.015* (-0.009)	0.131*** (-0.014)	0.133*** (-0.014)
TRAIL v. GBL	0.003 (0.008)	0.110*** (0.014)	0.114*** (0.014)

Explanations

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- Differences in borrower selection
- Difference in behaviour, conditional on selection
 - of agent
 - of borrowers

Selection Patterns by Borrower “Ability”

- We estimate the ability of sample farmers
- Check how selection patterns by ability differ in GRAIL and TRAIL schemes

“Ability” Estimates

Assume households' production function

$$Y = \theta^{1-\gamma} \left[\frac{1}{1-\alpha} l^{1-\alpha} \right]$$

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⇒

$$\log l^C = \frac{1}{\alpha} \log A + \frac{1}{\alpha} [\log P - \log \rho]$$

where

$$A \equiv \theta^{2-\gamma-\nu}$$

“Ability” of Selected Borrowers

Assume

$$A_h = T_h X_{1h}^{\psi_1} X_{2h}^{\psi_2} \dots$$

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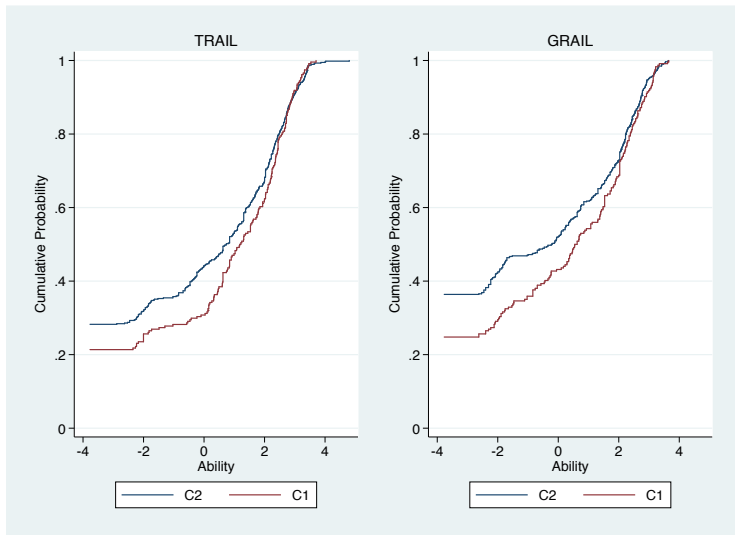
⇒

$$\log l_{ht}^C = \frac{1}{\alpha} \sum_k \psi_k X_{kh} + \frac{1}{\alpha} [\log T_h + \log P_{vt} - \log \rho_{vt}]$$

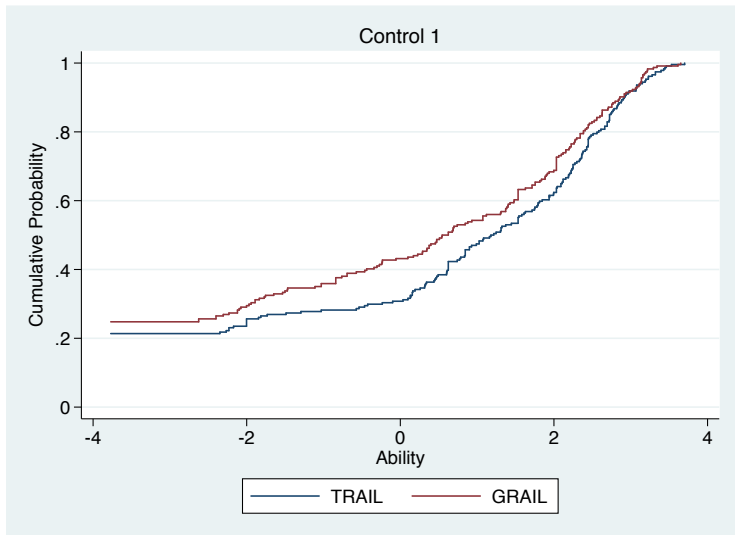
$$\log l_{ht}^C = \underbrace{\sum_k \beta_k X_{kh}} + u_h + \mu_{vt} + \epsilon_{ht}$$

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Ability estimates for Selected v. Non-selected households



Ability estimates for Selected, TRAIL v. GRAIL



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 - but no evidence that selected borrowers in GRAIL had lower landholding
- GRAIL agents may have been politically motivated

Political Motivation for Selection

- we asked households about their political preferences
 - have you ever changed the party you voted for in the past 30 years?
 - yes = “swing” voter
- concern: question asked in 2013; after treatment; so exclude Treatment borrowers
- caveat: must assume no spillover to control borrowers

Political Motives for Selection

Table: Dependent variable: Household was recommended (Control 1)

	TRAIL (1)	GRAIL (2)	Pooled (3)
Swing voter	0.008 (0.043)	0.103** (0.037)	0.004 (0.043)
GRAIL			-0.034* (0.019)
GRAIL × Swing			0.098* (0.057)
Landholding	-0.053 (0.060)	0.034 (0.061)	-0.010 (0.043)
Non-Hindu	-0.051 (0.045)	-0.013 (0.032)	-0.037 (0.029)
Low caste	-0.024 (0.040)	-0.030 (0.030)	-0.031 (0.025)
Age of oldest male	-0.000 (0.001)	0.002 (0.001)	0.001 (0.001)
Oldest male above primary school	0.047 (0.046)	-0.048* (0.027)	-0.002 (0.027)
Oldest male cultivator	0.111*** (0.037)	0.137*** (0.041)	0.127*** (0.028)
Oldest male labourer	0.033 (0.043)	0.074* (0.037)	0.053* (0.028)
Constant	0.238** (0.089)	0.061 (0.071)	0.163*** (0.058)
Observations	795	808	1,603
R-squared	0.019	0.037	0.023

Political Motives for Selection

Table: Dependent variable: Household voted for incumbent in straw poll

	TRAIL (1)	GRAIL (2)	TRAIL (3)	GRAIL (4)
Treatment Group	-0.040 (0.043)	0.161*** (0.039)	-0.096 (0.096)	0.122 (0.096)
Control 1 Group	-0.064 (0.040)	0.083** (0.038)	-0.103 (0.074)	-0.054 (0.080)
High margin GP			-0.101 (0.071)	-0.292*** (0.069)
High margin GP × Treatment Group			0.077 (0.105)	0.052 (0.103)
High margin GP × Control 1 Group			0.054 (0.089)	0.179** (0.089)
Observations	1,010	1,026	1,010	1,026
R-squared	0.028	0.048	0.033	0.095
Treatment Effect	0.024 (0.044)	0.078** (0.040)		
Selection Effect	-0.063 (0.040)	0.083** (0.038)		
Treatment effect, Low Margin GP			0.007 (0.080)	0.176* (0.098)
Selection effect, Low Margin GP			-0.103 (0.074)	-0.055 (0.080)
Treatment effect, High Margin GP			0.030 (0.054)	0.049 (0.044)
Selection effect, High Margin GP			-0.049 (0.048)	0.124*** (0.041)

Clientelism & Cronyism

- We examine whether Treatment households chose differently from Control 1 households
 - both were selected by the agent
 - only Treatment households received the loan
- In politically competitive areas, GRAIL agent's recommendation bought votes
- In uncompetitive areas, it may have been
 - cronyism
 - rewarding voters for loyalty

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Summary

- It is possible to use an incentive system that leverages local information
- Both privately appointed and publicly appointed agents outperform a community/NGO-type approach
- However the TRAIL scheme outperforms the GRAIL scheme
- Possibly because the GRAIL agents are also politically motivated