The Future in Mind: Short and Long Run Impact of an Aspirations Intervention in Rural Ethiopia

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Motivation: Do low aspirations limit economic choices?

Puzzle: Poor people in developing countries often **do not invest**, even when returns are high (Duflo et al., 2008; Bryan et al., 2012; Miguel and Kremer, 2004; Munshi and Rosenzweig, 2006)

Question: Do poor people have low aspirations – beliefs about what outcomes are possible in their future – which cause them to limit effort, investment or use of new technologies? (Genicot and Ray 2017 and Dalton et al. 2016)

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This paper

1. Can we **intervene to alter** poor people's aspirations **in the field in a poor setting**?
    - Test effects of **random exposure** to role models (Beaman et al., 2012, Chong et al. 2012, Jensen and Oster, 2009)
    - RCT where people are randomly chosen to be invited to watch documentaries about four role models
2. Do interventions **have persistent effects** on economic behaviour after six months and five years?
3. Are changes specifically to **exposure to role models**?
    - Placebo group: effects are not solely from exposure to media
    - Controls within village and in pure control villages: effect of exposure to outsiders is minimal; few spillovers

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Outline

1. **Conceptual framework**
2. Setting
3. Experimental design
4. Results

Conceptual framework: Model setup

A standard inter-temporal consumption and asset allocation model (Deaton 1992):

- Households maximise inter-temporal utility

$$V = E \sum_{t=0}^{\infty} \beta^t u(c_t, l_t) \tag{1}$$

  choosing consumption c_t, leisure l_t and a share w_t of assets to invest in a risky activity $f(k, e)$, requiring effort $e = T - l$. The remaining share of assets goes into an effortless, riskless activity with a safe return

- The asset evolves according to the equation:

$$A_{t+1} = r_{t+1}.(1 - w_t).(A_t - c_t) + f[w_t.(A_t - c_t), T - l_t] \tag{2}$$

Conceptual framework: Aspirations constraint

- We introduce a further "aspirations constraint" $\bar{q}$:

$$f[w_t.(A_t - c_t), T - l_t] \leq \bar{q} \tag{3}$$

- $\bar{q}$ is an exogenous parameter that measures individual's aspirations: the individual's belief about how much future output they can obtain in future from investing resources and effort into the risky activity

Conceptual framework: Optimal conditions

FOCs:

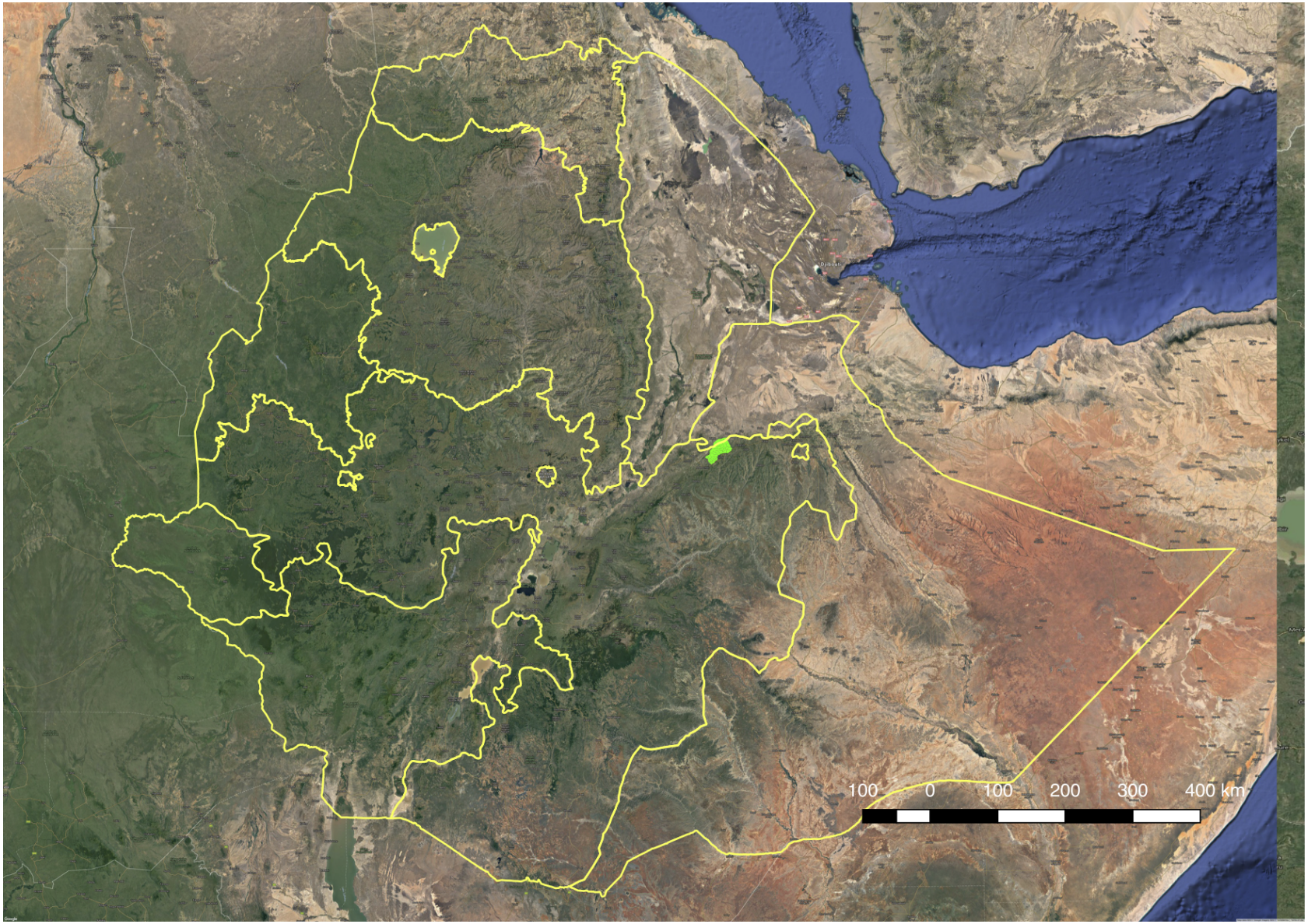
$$u_{l_t} = \beta E_t[(u_{c_{t+1}} - \lambda_{t+1}).f_{l_t}] \tag{4}$$

$$r_{t+1}.E_t u_{c_{t+1}} = E_t[f_{k_t}.(u_{c_{t+1}} - \lambda_{t+1})] \tag{5}$$

$$u_{c_t} = \beta E_t[w_t.f_{k_t}.(u_{c_{t+1}} - \lambda_{t+1}). + r_{t+1}.(1 - w_t).u_{c_{t+1}}] \tag{6}$$

- λ_{t+1} is the shadow price of relaxing the aspirations constraint
- If $\bar{q}$ is low and binding, then λ_{t+1} is likely to be positive
- Lower aspirations reduce the incentive to invest in the risky asset and lower expected lifetime returns

Ethiopia setting: Doba woreda



Ethiopia setting: Doba woreda

- High levels of fatalism
  - "It is a life of no thought for tomorrow"
  - "We have neither a dream nor an imagination" (Rahmato and Kidanu, 1999)
- Rural, isolated, poor district
  - 98.5% are subsistence farmers growing sorghum and maize (CSA, 2007)
  - Selected for the national Productive Safety Net Program (PSNP)
- Limited market economy
  - Only 10% rent land, 36% hire any labour
  - Only 54% use any modern agricultural technology
- 60% of sample had only seen TV once in the last year
- Only 72% of 7-15 year olds enrolled in school

Video to induce small changes in aspirations

A "vicarious experience" of a different life (Bandura, 1977)

Video to induce small changes in aspirations

Video to induce small changes in aspirations

Experimental design

Treatment groups:

1. Treatment
    - 2 tickets (head and spouse) to view mini-documentaries
    - 4 x 15 minute documentaries (2 men, 2 women) = 1 hour in Oromiffa
    - Examples on Future in Mind YouTube channel
2. Placebo
    - Local Ethiopian end-of-year TV show in 15 minute segments
3. Within village spillover
    - No treatment
    - Surveyed at their home
4. Pure control
    - Only at endline (Bidwell et al., 2016; Zwane et al. 2011).

Treatment
64 villages

Pure control
10 villages

Treatment
6 hh
= 691 ppl

Placebo
6 hh
= 717 ppl

Control
6 hh
= 707 ppl

Pure control
15 hh
= 322 ppl

Census: Sept-Dec 2010

Baseline: Sept-Dec 2010

Video: Sept-Dec 2010

Mini-survey: Sept-Dec 2010

Midline: Mar-May 2010

Endline: Dec 2015 – Jan 2016

Specification

For the short- and long-run, individual- or household-level outcomes:

$$y_{iv} = \alpha + \delta T_i + \rho P_i + X'_{i1}\pi + \tau_v + \eta_i \tag{7}$$

- For 64 villages after 6 months and 5 years
- X'_{i} = controls for demographics;
- τ_v = village fixed effects
- δ = effect of video, exposure to media, outsiders in the village
- δ - ρ = effect of content of video
- Attrition is low (9.6% of individuals after 5 years) and not predicted by treatment status or demographics ▸ Attrition
- Non-compliance of only 2% of treated individuals ▸ Non-compliance
- Results are robust to comparing to pure control villages

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Primary hypotheses (*= long run only)

- H1: The intervention increases expectations, aspirations for the future
- H2a: ... increases investment in education
- H2b: ... increases labour supply to work
- H3a: ... affects investment-oriented behaviour (the flow of inputs)*
- H3b: ... affects the stock of assets*

Secondary hypotheses (*= long run only)

H4: Household quality of life

- ... affects household consumption*, food security*, housing quality, subjective wellbeing

H5: Other psychological channels

- ... does not encourage respondents to undertake activities mentioned in the videos*
- ... does not affect preferences: risk aversion, impatience
- ... increases people's beliefs in their broader ability to control their own circumstances

Measures of expectations and aspirations on 4 dimensions

- 4 dimensions.
  - Annual income in cash
  - Assets: house, furniture, consumer goods, vehicles
  - Social status: do villagers ask advice
  - Level of education of oldest child
- Two phrasings:
  - **Expectations**: Level they expected to attain in ten years
  - **Aspirations**: Level on each dimension they wished to attain
- **Total aspirations index**: : $A_i = \sum_k \left(\frac{a_i^k - \mu_k}{\sigma_k} \right) . w_i^k$
  - a_i^k = individual i's aspiration/expectation response to dimension k.
  - w_i^k = weight individual assigned to dimension k.
  - μ_i^k and σ_i^k = sample mean and standard deviation at baseline.

Results: Increases in expectations, $\bar{q}$ (H1)

Similar effects on aspirations.

	Short Run				Long Run			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Expectations index	0.05**	0.02	0.03	-0.02	0.07***	-0.00	0.08***	-0.09
	(0.02)	(0.02)	(0.02)	(0.47)	(0.03)	(0.03)	(0.03)	(0.43)
	[0.06]*	[0.61]	[0.33]	2036	[0.03]**	[0.88]	[0.01]***	1887
Income (USD)	-274.31	-203.57	-70.75	2126.68	55.44	39.44	16.00	1340.59
	(321.49)	(330.23)	(279.77)	(6187.03)	(66.25)	(66.45)	(68.02)	(1008.87)
	[0.49]	[0.61]	[0.80]	2030	[0.50]	[0.69]	[0.81]	1863
Wealth (USD)	60.33	-48.98	109.32	1443.07	177.67*	71.45	106.22	1626.47
	(104.50)	(94.90)	(104.52)	(1753.42)	(100.91)	(100.36)	(99.79)	(1639.59)
	[0.56]	[0.61]	[0.49]	2004	[0.13]	[0.69]	[0.36]	1868
Social Status (% of individuals)	2.66**	1.89	0.77	67.14	-0.59	1.93	-2.52	65.02
	(1.31)	(1.33)	(1.32)	(31.17)	(1.63)	(1.63)	(1.62)	(25.87)
	[0.07]*	[0.61]	[0.70]	2027	[0.71]	[0.59]	[0.20]	1885
Education (years)	0.41**	0.13	0.28	13.47	0.64**	-0.34	0.97***	12.33
	(0.17)	(0.17)	(0.17)	(3.05)	(0.26)	(0.27)	(0.27)	(3.89)
	[0.06]*	[0.61]	[0.33]	1864	[0.04]**	[0.59]	[0.00]***	1780

*Notes:*The unit of observation is the individual. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2015 USD. Standard errors are clustered at household level. Standard errors are in parentheses. Minimum q-values in brackets.

▸ Robustness: comparison with pure control villages

Results: Increased aspirations for children's education (H1)

	Baseline		Short run	
	(1) Aspirations for child	(2) Difference for girls	(3) Aspirations for child	(4) Difference for girls
Panel A. Estimates for whole sample				
Aspirations for education (years)	14.08	-0.47***	0.27*	-0.10
	(2.42)	(0.11)	(0.15)	(0.27)
[=1] if aspires beyond secondary ed.	0.60	-0.09***	0.05*	-0.03
	(0.49)	(0.02)	(0.03)	(0.05)
Panel B. Difference if respondent is mother?				
Aspirations for education (years)	-0.60***	-0.23	0.09	-0.21
	(0.11)	(0.18)	(0.19)	(0.41)
[=1] if aspires beyond secondary ed.	-0.10***	-0.06*	0.03	-0.06
	(0.02)	(0.03)	(0.04)	(0.08)
Panel C. Difference if respondent has no education?				
Aspirations for education (years)	-0.62***	-0.44**	0.44**	-0.02
	(0.12)	(0.22)	(0.23)	(0.48)
[=1] if aspires beyond secondary ed.	-0.13***	-0.10**	0.09*	-0.01
	(0.03)	(0.04)	(0.05)	(0.10)
Obs.	1970		1932	

Notes: The unit of observation is the individual. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2015 USD. Standard errors clustered at the household-level are in parentheses. *See the Papers and Proceedings 2019 for details.*

Results: Increased investment in children's schooling (H2)

	Baseline		Short Run	
	(1)	(2)	(3)	(4)
	Baseline mean	Difference for girls	Treatment effect	Difference for girls
Children aged 6-20 in school	1.42	-0.27***	0.23**	-0.02
	(0.04)	(0.09)	(0.11)	(0.19)
Daily minutes in school for children aged 6-20	528.66	-113.10***	61.58*	-22.48
	(16.14)	(33.10)	(36.84)	(66.11)
Daily minutes studying for children aged 6-20	173.30	-32.27***	16.99	2.12
	(6.04)	(12.18)	(14.33)	(26.89)
Schooling expenditure (USD) for all	10.76	-2.29**	2.19*	2.15
	(0.46)	(0.98)	(1.21)	(2.30)
Obs.	908		924	

Notes: The unit of observation is the household. Sample is restricted to households with children aged 6-20. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2015 USD. Robust standard errors are in parentheses. *See the Papers and Proceedings 2019 for details.*

Results: Increase in hours worked (H2)

	Short Run				Long Run			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Number of adults	0.01	-0.02	0.02	2.51	0.05	0.01	0.04	2.48
	(0.05)	(0.05)	(0.05)	(0.97)	(0.06)	(0.06)	(0.06)	(0.88)
				1096				982
Daily minutes in paid work	-9.14	5.35	-14.49**	21.31	-3.84	5.63	-9.46	29.21
	(6.02)	(6.78)	(6.30)	(84.38)	(7.82)	(7.69)	(7.71)	(95.29)
	[0.30]	[0.58]	[0.03]**	1078	[0.62]	[0.46]	[0.33]	966
Daily minutes on family farm	28.42	-21.52	49.95**	710.09	86.73***	48.10*	38.63	730.55
	(22.15)	(20.61)	(21.49)	(356.92)	(25.16)	(25.29)	(26.57)	(338.33)
	[0.30]	[0.58]	[0.03]**	1090	[0.00]***	[0.17]	[0.33]	979
Daily minutes in leisure	28.55	-27.02	55.57	2115.93	-54.18	-82.09	27.91	2164.53
	(53.03)	(49.43)	(49.85)	(952.00)	(62.83)	(60.71)	(63.47)	(907.71)
	[0.59]	[0.58]	[0.26]	1092	[0.58]	[0.26]	[0.66]	979

*Notes:*The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Robust standard errors are in parentheses. Minimum q-values in brackets.

▸ Robustness: comparison with pure control villages

Results: Changes in use of modern inputs (H3)

	Long Run (1)	(2)	(3)	(4)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Any spending on modern crop inputs	0.11***	0.05	0.05	0.58
	(0.03)	(0.04)	(0.03)	(0.49)
	[0.01]***	[0.39]	[0.23]	986
Spending on seed, fertiliser etc (USD)	2.61*	1.91	0.70	14.06
	(1.39)	(1.48)	(1.45)	(18.47)
	[0.08]*	[0.39]	[0.63]	977
Purchases feed, vet supplies	0.10***	-0.03	0.13***	0.46
	(0.04)	(0.04)	(0.03)	(0.50)
	[0.01]***	[0.57]	[0.00]***	986
Spending on feed, vet (USD)	2.01	0.82	1.20	10.52
	(1.74)	(1.80)	(1.83)	(22.76)
	[0.25]	[0.65]	[0.63]	975

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▸ Robustness: comparison with pure control villages

Results: Increase in stock of assets (H3)

	Long Run (1) Treatment	(2) Placebo	(3) Treat. vs. placebo	(4) Control mean (SD) Total obs.
Value of livestock (USD)	96.38*	-5.55	101.93*	771.59
	(55.46)	(55.81)	(52.91)	(747.23)
	[0.08]*	[0.99]	[0.10]	1004
Value of productive assets (USD)	12.99***	8.83*	4.15	42.05
	(4.58)	(5.32)	(5.62)	(48.97)
	[0.02]**	[0.39]	[0.46]	986
Value of nonprod. assets (USD)	9.71**	2.16	7.55*	27.30
	(4.02)	(3.74)	(4.28)	(46.37)
	[0.03]**	[0.99]	[0.10]	984

*Notes:*The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2015 USD. Robust standard errors are in parentheses. Minimum q-values in brackets.

▸ Robustness: comparison with pure control villages ▸ Robustness: estimation with baseline controls

Magnitude of effects

- Livestock: ATE is 96.4 USD (12% of control mean) – about 26 chickens (3.8USD), or 3 goats (32USD) or "0.7" cows (140USD) (median kebele-level price per unit)
- Non-productive assets: ATE is 13 USD (30% of control mean) – about 2 chairs (7USD).
- Productive assets: ATE is 9.7 USD (32% of control mean) – about "1.7" ploughs (5.6USD), or about 2 hoes (6.5USD) (median replacement-value per unit)

Results: Small improvements in quality of life (H4)

- Small increases in non-durable consumption
  ▸ Results
- Improvements in value of house, housing quality (non-organic roof, own toilet)
  ▸ Results
- No changes in subjective well-being
  ▸ Results

Results: Can alternative mechanisms explain this? (H5)

- Are the videos giving out new concrete information?
  - No effect on whether households undertake specific behaviours included in the videos ▸ Results
  - Effects also occur on variables not covered in the videos e.g. education aspirations; education investment
- No effect on **preferences**: time preferences, risk aversion at midline and endline ▸ Results
- Short term effect on locus of control but no effect in the long term ▸ Results
- Social desirability bias? But small increases in fertiliser use show up in district data ▸ Results

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A light touch intervention changes aspirations and behaviour persistently

Our hopes and dreams, our narratives of our own capabilities and the futures that are possible for us, affect our economic behaviour.

After 5 years

1. Increases in **aspirations and expectations**, especially for children's education
2. Changes in economic behaviour.
    - Improvement in children's **education spending**
    - Increase in spending on **agricultural inputs** (fertiliser, seeds) and stock of productive assets
    - Small changes in durables consumption, food security and housing quality
    - No changes on subjective well-being

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Appendix

Non-compliance

- Non-compliance is very limited (2% of treated individuals).

	Individuals			Households		
	All villages	Treatment villages	Control villages	All villages	Treatment villages	Control villages
Number of villages	74	64	10	74	64	10
Observations						
In sample	2644	2111	322	1313	1133	180
Given tickets	2111	2111	0	1133	1133	0
Compliers	2069	2069	0	1106	1106	0
Non-compliers	42	42	0	27	27	0
of which						
At wrong screening	20	20	0	12	12	0
Missed screening	22	22	0	15	15	0
Among compliers						
Treatment	673	673	0	365	365	0
Placebo	698	698	0	367	367	0
Within-village control	698	698	0	374	374	0
% of non-compliers	2	2	.	2.4	2.4	.

Back

Attrition

Individuals in treated villages				
Baselined and eligible	2111	690	717	704
Surveyed in all 3 rounds	1898	618	644	636
Total dropped from main sample				
Resurveyed in round 2 only	165	57	58	50
Resurveyed in round 3 only	36	8	14	14
% sample attrited	.095	.094	.1	.091
Individuals in pure control villages				
Surveyed	322	0	0	0
Households in treated villages				
Baselined and eligible	1133	377	378	378
Households in treated villages				
Surveyed in all 3 rounds	1009	337	333	339
Total dropped from main sample				
Resurveyed in round 2 only	101	33	39	29
Resurveyed in round 3 only	16	5	5	6
% sample attrited	.103	.101	.116	.093
Households in pure control villages				
Surveyed	180	0	0	0

▸ Back

Household welfare: Consumption (Hypothesis 4)

Food security items from USAID surveys (Bickel et al. 2000)

	Long Run (1) Treatment	(2) Placebo	(3) Treat. vs. placebo	(4) Control mean (SD) Total obs.
Food consumption (7d, USD)	-0.17	0.14	-0.31	5.32
	(0.24)	(0.25)	(0.26)	(3.44)
	[0.48]	[0.66]	[0.29]	965
Nonfood consumption (30d, USD)	0.26**	0.06	0.19	1.65
	(0.12)	(0.12)	(0.13)	(1.44)
	[0.15]	[0.66]	[0.20]	963
Nonfood consumption (12m, USD)	3.93*	-0.87	4.80**	35.00
	(2.16)	(1.98)	(2.07)	(25.70)
	[0.15]	[0.66]	[0.05]*	964
Food Security index: z-score	-0.12	-0.07	-0.05	0.06
	(0.08)	(0.07)	(0.07)	(1.03)
	[0.15]	[0.66]	[0.54]	986
Months of food insecurity	-0.25	0.11	-0.36**	2.59
	(0.15)	(0.15)	(0.15)	(1.97)
	[0.15]	[0.66]	[0.05]*	986

*Notes:*The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2015 USD. Robust standard errors are in parentheses. Minimum q-values in brackets.

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Household welfare: Housing quality (Hypothesis 4)

	Long Run (1)	(2)	(3)	(4)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Value of house	166.45***	36.98	129.48***	560.80
	(39.68)	(36.06)	(40.14)	(500.34)
	[0.00]***	[0.31]	[0.00]***	975
Non-organic roof	0.06**	0.05	0.02	0.69
	(0.03)	(0.03)	(0.03)	(0.46)
	[0.05]*	[0.20]	[0.78]	985
Own toilet	0.07*	0.06*	0.01	0.39
	(0.04)	(0.04)	(0.04)	(0.49)
	[0.05]*	[0.20]	[0.78]	986

*Notes:*The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Figures in 2015 USD. Robust standard errors are in parentheses. Minimum q-values in brackets.

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Household welfare: Subjective well-being (Hypothesis 5)

	Short Run				Long Run			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Subjective wellbeing index	0.07	0.00	0.07	0.45	0.07	0.03	0.03	0.22
	(0.05)	(0.05)	(0.05)	(0.87)	(0.06)	(0.06)	(0.05)	(0.90)
	[0.17]	[0.97]	[0.18]	2037	[0.23]	[0.55]	[0.54]	1920

*Notes:*The unit of observation is the individual. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Standard errors are clustered at household level. Standard errors are in parentheses. Minimum q-values in brackets.

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Measures of sense of control over one's own life

- **Locus of control** from social psychology (Heckman et al., 2006, 2012) IPC scale (Levenson, 1981)
  - Internality - people see outcomes as contingent on individual behaviour
  - Chance scale - chance or fate determines outcomes
- **Attributions for Poverty scale** from sociology (Feagin, 1972, 1975)
  - The characteristics of individuals cause their poverty
  - Fate causes poverty

▸ Back: Alternative mechanisms

No changes: Locus of control (Hypothesis 5)

	Short Run				Long Run			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Internal locus of control	0.23*	-0.06	0.28**	12.94	-0.04	0.05	-0.09	12.27
	(0.12)	(0.12)	(0.12)	(2.09)	(0.11)	(0.11)	(0.12)	(1.91)
	[0.23]	[0.91]	[0.14]	2014	[0.94]	[0.97]	[0.90]	1887
Individual causes of poverty	0.22	0.17	0.05	9.20	0.01	-0.01	0.02	9.15
	(0.14)	(0.14)	(0.14)	(2.39)	(0.14)	(0.13)	(0.13)	(2.03)
	[0.23]	[0.62]	[0.87]	2013	[0.95]	[0.97]	[0.90]	1887
Chance locus of control	-0.00	-0.02	0.01	13.33	0.04	-0.07	0.11	12.66
	(0.17)	(0.16)	(0.17)	(2.70)	(0.15)	(0.15)	(0.15)	(2.35)
	[0.98]	[0.91]	[0.94]	2011	[0.94]	[0.97]	[0.90]	1887
Fate causes of poverty	-0.26*	0.02	-0.29*	7.40	-0.03	-0.00	-0.03	6.85
	(0.16)	(0.15)	(0.15)	(2.65)	(0.12)	(0.12)	(0.12)	(2.05)
	[0.23]	[0.91]	[0.19]	2012	[0.94]	[0.97]	[0.90]	1887
Structural causes of poverty	0.16	0.35**	-0.19	12.79	-0.08	-0.04	-0.05	12.67
	(0.18)	(0.17)	(0.17)	(2.85)	(0.14)	(0.15)	(0.15)	(2.37)
	[0.55]	[0.26]	[0.56]	2004	[0.94]	[0.97]	[0.90]	1887
Others locus of control	-0.05	0.04	-0.09	12.60	0.18	0.03	0.15	12.46
	(0.18)	(0.17)	(0.17)	(3.18)	(0.16)	(0.17)	(0.17)	(2.79)
	[0.94]	[0.91]	[0.87]	2009	[0.94]	[0.97]	[0.90]	1887

*Notes:*The unit of observation is the individual. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Standard errors are clustered at household level. Standard errors are in parentheses. Minimum q-values in brackets.

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No changes: Preferences (Hypothesis 4)

	Short Run				Long Run			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Risk aversion: coin	-0.10	0.00	-0.10*	1.26	0.01	0.05	-0.05	1.81
	(0.06)	(0.06)	(0.06)	(1.13)	(0.08)	(0.08)	(0.08)	(1.28)
	[0.50]	[0.97]	[0.23]	2035	[0.94]	[0.71]	[0.68]	1887
Risk aversion: market	-0.05	0.06	-0.12*	1.25	-0.03	0.03	-0.05	1.82
	(0.06)	(0.06)	(0.06)	(1.16)	(0.08)	(0.07)	(0.08)	(1.26)
	[0.83]	[0.73]	[0.23]	2035	[0.91]	[0.71]	[0.68]	1887
Impatient	0.01	0.02	-0.01	0.70	0.01	0.01	0.00	0.82
	(0.03)	(0.02)	(0.02)	(0.46)	(0.02)	(0.02)	(0.02)	(0.39)
	[0.83]	[0.85]	[0.82]	2037	[0.91]	[0.71]	[0.88]	1920
Present-biased	0.01	0.03	-0.02	0.33	0.03	0.05*	-0.02	0.53
	(0.03)	(0.03)	(0.03)	(0.47)	(0.03)	(0.03)	(0.03)	(0.50)
	[0.83]	[0.73]	[0.74]	2012	[0.76]	[0.31]	[0.68]	1887
Future-biased	0.01	0.01	0.00	0.22	-0.04*	-0.02	-0.02	0.18
	(0.02)	(0.02)	(0.02)	(0.41)	(0.02)	(0.02)	(0.02)	(0.39)
	[0.83]	[0.93]	[0.97]	2012	[0.25]	[0.71]	[0.68]	1887

*Notes:*The unit of observation is the individual. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Standard errors are clustered at household level. Standard errors are in parentheses. Minimum q-values in brackets.

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No changes: Information (Hypothesis 4)

	Long Run			
	(1)	(2)	(3)	(4)
	Treatment	Placebo	Treat. vs. placebo	Control mean (SD) Total obs.
Information index	0.00	0.01	-0.01	0.05
	(0.02)	(0.02)	(0.02)	(0.31)
	[0.85]	[0.57]	[0.69]	999

*Notes:*The unit of observation is the household. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Robust standard errors are in parentheses. Minimum q-values in brackets.

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Findings verified in district data

District record data on tech adoption

	(1) Treated Kebele	(2) Control Kebele mean	(3) Standardised (SD)	(4) Obs difference
Amount of fertilizer ordered	18.19	154.12	0.27	27
	(46.27)	(110.75)		
	[0.81]			
% of farmers using chemical fertilizer	0.10**	0.41	0.87	27
	(0.05)	(0.12)		
	[0.08]*			
% of farmers using pesticide/herbicide	0.09**	0.05	0.80	27
	(0.04)	(0.07)		
	[0.05]**			
% of farmers using improved grain seeds	0.02	0.32	0.10	27
	(0.08)	(0.19)		
	[0.83]			
% of farmers using veterinary products	0.10*	0.71	0.78	27
	(0.05)	(0.13)		
	[0.09]*			
Agric. cooperative in Kebele	0.54***	0.25	1.10	27
	(0.19)	(0.46)		
	[0.03]**			
Joint *p*-value	0.68			

The unit of observation is the district. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level. Standard errors are in parentheses. Minimum q-values in brackets.

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