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The Future in Mind: Long-run Impact of an Aspirations Intervention in Rural Ethiopia

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Outline

- ❑ Motivation
- ❑ Summary – questions, approach, findings, contributions
- ❑ Some Theory
- ❑ A five-year evaluation of a field experiment
 - Design;
 - Findings – summarize results related to aspirations, beliefs, and future-oriented behaviour

Motivation

Do low aspirations limit economic choices?

- ❑ Poor people in developing countries often *do not invest, even when returns are high*:

Examples: Duflo et al., 2008; Bryan et al., 2012; Miguel and Kremer, 2004; Munshi and Rosenzweig, 2006;

- ❑ People may form beliefs that they are *unable to improve* their economic position:

Examples: Rahmato and Kidanu, 1999

“It is a life of no thought for tomorrow”

“We have neither a dream nor an imagination”

- ❑ Limit effort, investment, uptake of new technologies.

Summary: Question and approach

□ Questions:

- *Are low aspirations a possible explanation?*
- *Can we change aspirations persistently?*

□ Aspirations

- *forward-looking goals* or targets (Locke and Latham, 2002).
- *bounds among individuals' preferences*, the elements of the choice sets which they consider as relevant for them and motivate their actions.

Summary: Question and approach

□ Approach

- *Treatment* – randomly invite farmers to watch documentaries about ‘role models’
- *Placebo* – randomly invite another group of farmers from the same villages to watch an Ethiopian TV entertainment programme;
- *Control I* (within-treatment-village controls) – randomly select and survey framers from the same villages
- *Control II* (pure controls) – randomly select and survey framers from pure control villages, where no treatment took place, after five years.

Summary: Findings

- ❑ Find small changes
 - **Aspirations and expectations**, especially for children's education – *higher after 6 months (persists over 5 years)*
 - **Internal locus of control** – *increases after 6 months (does not persist over 5 years)*
- ❑ Small but significant changes in **future-oriented behaviour**
 - Savings, credit *increase after six months (do not persist)*;
 - Child school enrolment and spending on schooling *increase after six months (persist after 5 years)*
 - Small increases in spending on agricultural inputs (seeds and fertilizer and land rented) (*tested only after 5 years*)
- ❑ Small changes in **welfare**: stock of assets; durables consumption (*tested only after 5 years*)
- ❑ **Spill-over effects** on variables - children's school enrolment, investment in crops and livestock, and consumption (*after 5 years*)

Summary: Contributions/caveats

- ❑ **Clear link** from exposure to potential role models to changes in **aspirations/beliefs** and **outcomes**.
 - Build on work on exposure to female role models (Beaman et al., 2012; and others).
 - **No other intervention; experimental design.**
 - **Placebo:** control for effects of exposure to media, gathering.
 - **Provide little to no concrete new information** (unlike Jensen, 2010, 2012).
- ❑ Long run follow up;
- ❑ Examine **spillovers** - within-village controls pure control villages;

Caveat

- ❑ *How aspirations are formed or why they are lower among the poor* (Dalton et al. 2016 vs Genicot and Ray 2017));
- ❑ *External validity* of point estimates of effects in a less remote contexts;

A Theoretical Framework

$$\text{Max}_{\{c_t, l_t, w_t\}_{t=0}^{\infty}} V = E \sum_{t=0}^{\infty} \beta^t u(c_t, l_t)$$

subject to:

$$A_{t+1} = \left[r_{t+1}(1 - w_t)(A_t - c_t) + f\left(w_t(A_t - c_t), T - l_t\right) \right]$$
$$\bar{q} = f\left(w_t(A_t - c_t), T - l_t\right)$$

- Agnostic about why aspirations are lower:
- Bellman equation, FoCs, the envelope theorem ultimately lead to the following solution



A Theoretical Framework

$$l_t : u_{l_t} = -\beta E_t f_{l_t}(u_{c_{t+1}} - \lambda_{t+1}) \quad (1)$$

$$w_t : r_{t+1} E_t u_{c_{t+1}} = E_t f_{k_t}(u_{c_{t+1}} - \lambda_{t+1}) \quad (2)$$

$$c_t : u_{c_t} = \beta E_t [w_t f_{k_t}(u_{c_{t+1}} - \lambda_{t+1}) + r_{t+1}(1 - w_t)u_{c_{t+1}}] \quad (3)$$

λ_{t+1} = the shadow cost of the aspirations constraint

- as if lower marginal benefit of using leisure in the form of effort - incentives for more leisure and less effort;
- as if lower return to the productive activity - incentives to invest in the effortless asset than the productive activity;
- as if the risky productive activity gets a lower weight, as if the overall return to investing in the future should be valued lower than without the aspirations constraint



A Theoretical Framework

Why low aspirations?

- ❑ *Origin 1 – lack of (Jensen (2010)) or inattention (Hanna, Mullainathan, and Schwartzstein (2014)) to relevant information*

Assessment: no specific information on returns in the experimental design; tests whether any specific information to which subjects are exposed via the videos matters or not

- ❑ *Origin 2 – low perceived probability of success*

- ❑ *Origin 3 - beliefs about oneself and aspirations are shaped by society, an individual's past experiences, persuasion, or all three.*

Assessment: important channels – intervention is exposure to potential role models (persuasion and a social channel).



Experimental setting: Doba woreda

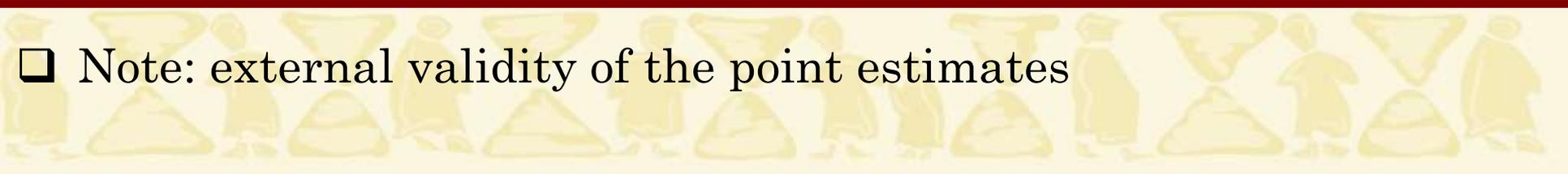
❑ Rural, isolated, poor district

- Only 1.5 per cent of Doba's population urban; 99% were subsistence farmers growing sorghum and maize (Central Statistical Agency, 2007)
- Selected for the national Productive Safety Net Program (PSNP) in 2005
- 60% of population had only seen TV once in the last year or never

❑ Limited market economy

- 96% of sample households in agriculture, all own some livestock
- Only 10% rent land, 36% hire any labour
- Only 47% use any modern agricultural technology

❑ Note: external validity of the point estimates



Experimental design: village level

□ *Village level-randomization:*

- 84 villages randomly selected from woreda village list;
- Treatment villages (~36 people per village, 64 villages = 2,115)
- Pure control villages (~30 people per village, 20 villages = 631)

(Only at endline (Bidwell et al., 2016; Haushofer and Shapiro, 2016, Zwane et al. 2011).



Experimental design: within villages

- Within 64 treatment villages – *households randomly selected from a complete listing of village households;*
 - Treatment (~12 people per village = 691)
Ticket to view 4 x 15 minute documentaries (2 men, 2 women) in Oromiffa;
Documentaries specifically produced for the experiment;
Examples on YouTube;
 - Placebo (~12 people per village = 717)
(Local Ethiopian TV show)
 - Within Village Spillover (~12 people per village = 707)



Timeline

- ❑ **Treatment, placebo, within village control**
 - Baseline (Sept-Dec 2010)
 - Aspirations/expectations immediately after treatment
 - Follow-up (Mar-May 2011)
 - Endline (Dec 2015-Jan 2016)

- ❑ **Pure control**
 - Endline (Dec 2015-Jan 2016)



Balance

□ Individual level

- Balanced within treatment villages at baseline.
- Balanced on demographics/assets at endline across all four groups

□ Village level

- Treatment and pure control villages are balanced on 30 of 33 endline village characteristics (specified in PAP).
- Treatment and pure control villages are balanced on 6 characteristics from GPS data at baseline.

	Mean	SD	p-value*
Altitude (m)	1,884.85	134.504	.59
Distance to city	11,916.88	3,003.45	.76
Distance to health centre	9,921.81	4,523.4	.66
Distance to market place	10,246.1	3,683.94	.995
Distance to river	2,598.62	1,633.69	.28
Distance to road	5,950.98	3,252.57	.29

* Treatment=Control

Non-compliance and attrition

- ❑ Non-compliance is very limited (2% of treated individuals).
- ❑ Attrition is small (9.6% of individuals) for a five year follow-up.
 - Younger individuals appear to attrite more;
 - attrition, treatment status and outcomes are not correlated;
 - analysis is conducted on 1,898 individuals: all respondents in treatment villages surveyed in all three rounds and respondents in pure control villages surveyed in the endline.



Primary hypotheses

- Does intervention lead to changes in **aspirations, beliefs and behaviour?** (*= 6 month and 5 years)
 - **H1: Aspirations/Self-belief**
 - Aspirations*, expectations*
 - Beliefs in ability to control their own circumstances*;
 - Beliefs in the extent to which their lives are controlled by chance*.
 - **H2: Labour supply and human capital investments**
 - Increases in labour supply to work, investment in education*.
 - **H3: Future-oriented economic behaviour**
 - Effects on savings*; credit choices*; investment-oriented behaviour (the flow of inputs); stock of assets*,



Secondary hypotheses

□ Are aspirations really the channel? Do behaviour changes affect welfare?

- **H4: Other channels**

- risk aversion*,
- discount rates*,
- respondents undertake activities mentioned in the videos

- **H5: Household welfare**

- household consumption,
- income



Measures – aspirations, expectations

□ *Four dimensions:*

- Annual income in cash
- Assets: house, furniture, other consumer durables goods, vehicles
- Social status: do villagers ask for advice
- Level of education of oldest child

□ *Aspirations, Expectations:*

- What is the level of ___ that you would like to achieve?
- What is the level of ___ that you think you will reach within ten years?

□ *Overall aspiration index:*

$$A_i = \sum_k w_i^k \left(\frac{a_i^k - \mu_k}{\sigma_k} \right)$$

a_i^k = individual i 's aspiration response to dimension k .

w_i^k = weight individual i assigned to dimension k .

μ_k, σ_k = village sample mean and standard deviation for dimension k .

Empirical specification – long-run

- Intention-to-Treat (ITT) effect of the intervention estimated;
- High rates of compliance implies substantial difference from the Average Treatment Effects on the Treated (ATT) unlikely;

$$y_{i3} = \alpha + \beta_1 T_i + \beta_2 P_i + \beta_3 C_i + X_i' \beta_4 + \varepsilon_i$$

- For 84 villages after 5 years.
 - X_i' = (next slide)
 - β_1 = effect of video, exposure to media, outsiders in the village (*policy relevant effect*)
 - $\beta_1 - \beta_2$ = effect of content of a video (*controlling for exposure to media, outsiders in the village, baseline surveys*)
-
- Run, separately, for $t=2010$ (after 6 months with out pure controls) and $t=2015$ (after 5 years)

Empirical specification – long-run

- ❑ time-invariant demographic controls:
 - age and gender,
 - marital status,
 - highest completed school grade, and
 - land owned.

- ❑ village level controls at endline:
 - hectares of agricultural land,
 - percentage of households with radio,
 - dummies for whether the village has a primary school, electricity, radio transmission, TV transmission, cellular/mobile transmission
 - time and cost of trip to the nearest market,
 - distance of the village to the nearest cities, health centre, river and market place.

- ❑ LASSO ('least absolute shrinkage and selection operator') procedure to select the most predictive covariates:



Long-run Results - (Hypotheses 1, 2, 3, and 5)

	Treatment	Placebo	Treatment vs. placebo
Aspirations index	0.07*	-0.02	0.09**
	(0.04)	(0.04)	(0.04)
	[0.06]*	[0.95]	[0.02]**
Expectations index	0.08***	0	0.08***
	(0.03)	(0.03)	(0.03)
	[0.00]***	[0.95]	[0.00]***
Daily minutes on family farm	70.85***	14.98	55.87**
	(24.51)	(24.50)	(25.21)
	[0.01]**	[0.54]	[0.08]*
Children aged 7-15 in school	0.21**	0.12	0.09
	(0.10)	(0.10)	(0.10)
	[0.06]*	[0.43]	[0.35]
Any spending in modern crop production inputs	0.10***	0.04	0.06*
	(0.03)	(0.03)	(0.03)
	[0.01]***	[0.43]	[0.26]
Food gap	-0.36***	0.07	0.42***
	(0.13)	(0.13)	(0.13)
	[0.04]**	[0.91]	[0.00]***

Long-run Results - (Hypotheses 4)

	Treatment	Placebo	Treatment vs. placebo	Control mean
Internal locus of control	0.02	0.08	-0.05	12.26
	(0.11)	(0.11)	(0.11)	
	[0.95]	[0.9]	[0.9]	
Risk aversion	-0.04	0.02	-0.06	1.81
	(0.08)	(0.08)	(0.08)	
	[0.63]	[0.75]	[0.52]	
Impatience	0.02	0.01	0.01	
	(0.02)	(0.02)	(0.02)	0.83
	[0.63]	[0.75]	[0.65]	



Long-run Results: (Hypothesis 4)

- Are the videos giving out new concrete information?
 - No effect on whether households undertake specific behaviours included in the videos (grain milling, trading income, irrigation, use agricultural extension, planting cash crops, stone bunds, keeping cattle).
 - Effects also occur on variables not covered in the videos e.g. education aspirations; education investment; formal savings



Multiple Testing

- For all tables, **q-values corrected within family** (Benjamini et al. 2006)
 - H1: **Beliefs:** aspirations*, expectations*, beliefs about fate and chance;
 - H2: **Labour supply and human capital:** children enrolled*, schooling expenditure*, labour supply
 - H3: **Investment:** stock of savings, credit expenditure on livestock and agricultural inputs*.

- PAP: <https://www.socialscisceregistry.org/trials/1483>



Observations

- A light touch intervention changes aspirations and behaviour persistently, after 5 years, in treatment vs placebo (due to video)
 - Increases in aspirations and expectations on wealth and children's education.
 - Changes in economic behaviour.
 - Improvement in children's school enrolment and education spending.
 - Increase in spending on agricultural inputs.
 - Effects on credit and savings from short run don't persist.
 - Small changes in indicators of economic welfare: assets and durables consumption after 5 years.
 - Spillover effects – control in treatment villages vs. pure control)



Thank you

