

Friends, Fear and Finance

Buying Health Insurance in rural Kenya

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Motivation

A pair of problems in practice:

1. Low demand
2. Adverse selection

and a pair of puzzles in the literature (Cole et al., 2008; Gine et al., 2008; Cai et al., 2010):

1. The risk averse are particularly *unlikely* to buy insurance in many cases.
2. Evidence suggests a role for *trust* in the purchasing of insurance: embeddedness in social networks, endorsements, and connectedness to marketing organizations

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We present evidence from a randomized, controlled trial, in the context of the roll-out of a composite health-insurance product in rural Kenya.

- ▶ The field experiment allows us to identify the shape of the demand curve for health insurance in this population.
- ▶ We provide a theoretical grounding for the interplay of risk aversion and trust that is consistent with expected utility theory.
- ▶ We undertake laboratory experiments in the field to provide measures of attitudes toward risk and trust, which correlate strongly with insurance adoption and replicate findings from the literature.
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Outline

Theoretical motivation

Design and data

- Baseline survey

- Experimental design

Insurance adoption

Peers

Discussion

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Perceptions and preferences in the demand for insurance

- ▶ We operationalize *trust* as the individual's subjective belief about the likelihood of a payout, conditional on hospitalization.
- ▶ Together with a subjective probability distribution over the possible hospitalization costs, this defines a compound lottery (cf. Doherty and Schlesinger 1990, on insurer default; Clarke 2010, on basis risk).
- ▶ Claim: For sufficiently low levels of trust, and in cases where individuals place weight on sufficiently costly hospitalization events, an increase in risk aversion can have a *negative* effect on the difference in expected utilities with and without insurance:

$$\frac{\partial}{\partial \rho} \{E[U(1; t, \rho, f)] - E[U(0, t, \rho, f)]\} < 0, \quad t < \bar{t} \quad (2.1)$$

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Population under study are tea growers in the Mount Kenya area, who belong to Wananchi SACCO.

- ▶ Wananchi members organized into 162 tea collection centres. We randomly selected 150 centres, subject to criteria of > 10 members, for inclusion.
- ▶ In each centre, we sample the *delegate*—an elected representative to Wananchi's board—as well as nine randomly selected members.
- ▶ Each was administered a detailed questionnaire between December 2009–January 2010:
 - ▶ Survey-based measures of demographic, economic characteristics, health histories and perceptions.
 - ▶ Laboratory experiment in the field used to measure risk preferences (Holt & Laury 2002) and trust (Berg, Dickhaut & McCabe 1995).

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Measuring attitudes toward risk

Gamble-choice game

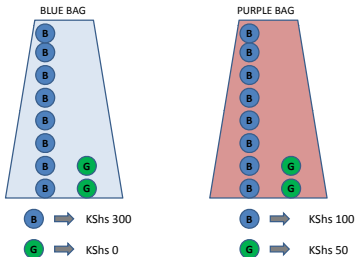
- ▶ In a series of 6 tasks, subjects choose between two lotteries (Holt & Laury (2002), Barr and Genicot (2008), Harrison, Humphrey & Verschoor (2010))
- ▶ Each task consists of two lotteries, a 'risky' choice with payoffs of (300,0) and a 'safe' choice with payoffs of (100,50).
- ▶ Probability of winning the larger prize is the same in each lottery within a given task, and varies from 0.3 to 0.8 across tasks.

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Series A : Choice 1



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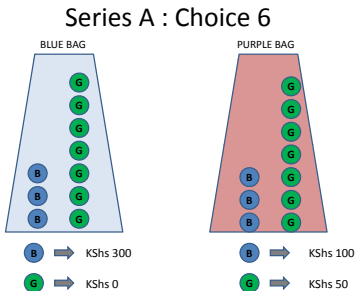
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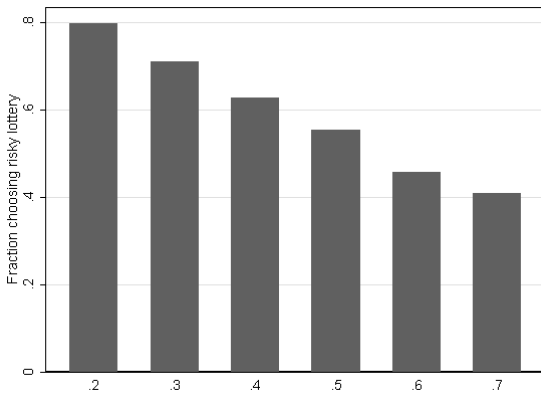
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Measuring risk attitudes

Gamble-choice outcomes



Measuring trust

Trust is measured in a laboratory setting by a *trust game* (Berg et al. 1995, Barr 2003).

- ▶ Delegate and one randomly selected ordinary member play the role of 'trustee' (Player 2); all other survey respondents randomly allocated to play with one of these (as Player 1).
- ▶ Player 1 is allocated KShs 200, which she can divide between herself and Player 2. Any amount sent to P2 is tripled. P2 then decides how much to return to P1.
- ▶ P2 plays by strategy method, with P2 payoffs determined by randomly pairing them with one of the four P1s with whom they play.

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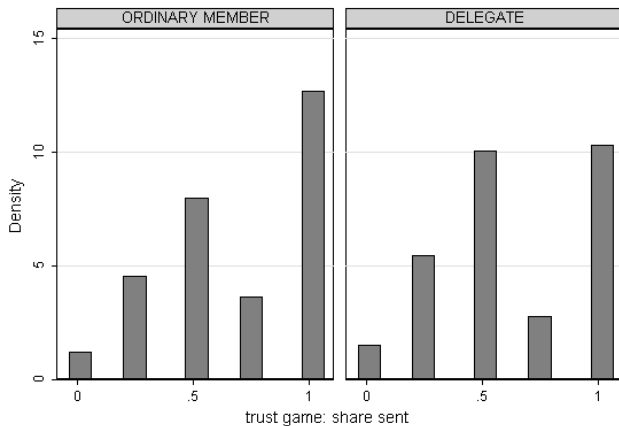
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Graphs by trustgivetowho

Measuring beliefs

- ▶ We adapt approach of Manski (2004), Attanasio (2009) to measure subjective probability distribution over hospitalization costs.
- ▶ In two steps:
 1. Probability of non-zero hospitalization costs
 2. Distribution of hospitalization costs conditional on $h > 0$.
- ▶ Median expected hospitalization expenditure KShs 11,389 (sd 93,883). (Median monthly consumption KShs 13,431.)
- ▶ There is a lot of subjective uncertainty surrounding hospitalization costs, conditional on an event (sd= 7,757).

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The policy

Bima ya Jamii

- ▶ *Bima ya Jamii* is a composite health insurance product, offered by CIC Kenya, comprising:
 - ▶ In-patient hospital cover (NHIF);
 - ▶ Funeral insurance;
 - ▶ Disability;
 - ▶ Lost income during hospitalization stays for principal member;without exclusions for prior conditions.
- ▶ Annual premium of KShs 3,650 (approximately USD 41), payable up front.
- ▶ Marketing was undertaken in Wananchi tea centres from April of 2010.
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Experimental design

- ▶ Experimental variation was introduced along two dimensions:
 - ▶ Tea-collection centres were randomly allocated to one of four arms: control, marketing only, marketing + education, marketing + referral incentive.
 - ▶ Individuals in treatment centres randomly allocated vouchers of 0, 10%, or 20% of premium, with probabilities of 1/3.
- ▶ Result is a factorial design:

Vouchers	Control (60)	Marketing		
		Marketing only (30)	Study circles (30)	Referral incentive (30)
KShs 0	597	105	108	98
KShs 365	0	90	91	94
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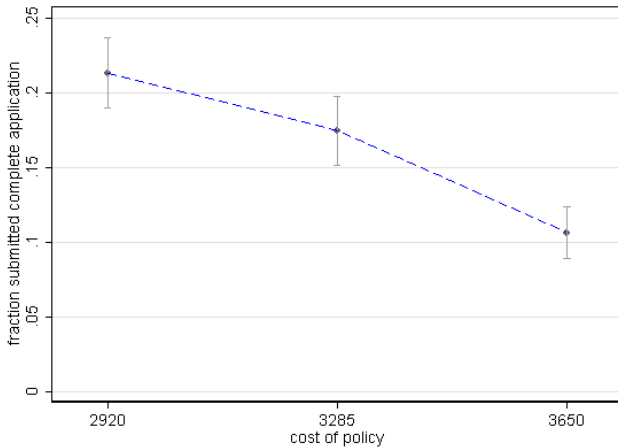
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Experimental results: prices and demand



Insurance adoption

Experimental results: treatments and interactions

	(1)	(2)
voucher, 365 KShs	0.0678** (0.03)	0.0667 (0.05)
voucher, 730 KShs	0.106*** (0.03)	0.131** (0.07)
referral incentive	-0.0807** (0.04)	-0.0685 (0.05)
learning intervention	-0.0240 (0.04)	-0.0109 (0.05)
voucher, 365 KShs × referral incentive		-0.0106 (0.07)
voucher, 365 KShs × learning intervention		0.0130 (0.07)
voucher, 730 KShs × referral incentive		-0.0262 (0.07)
voucher, 730 KShs × learning intervention		-0.0499 (0.08)
Constant	0.142*** (0.03)	0.133*** (0.04)
Obs	891	891
(i): F stat (p value)	0.342 (0.560)	
(ii): F stat (p value)		0.223 (0.925)

Notes: Robust standard errors, clustered by tea-collection center. Test statistics for hypotheses that (i) coefficient on voucher of 730 is twice coefficient on voucher of 365; (ii) interaction effects are jointly insignificant.

Correlates of demand

	(1)	(2)	(3)	(4)	(5)
voucher $\in \{0, 1, 2\}$	0.055*** (0.014)	0.077*** (0.029)	0.084*** (0.029)	0.113*** (0.036)	0.070 (0.053)
Pr(hosp costs > 0)	0.074 (0.053)	0.122* (0.070)	0.124* (0.071)	0.137* (0.078)	0.009 (0.092)
ln HH consumption	-0.006 (0.010)	-0.006 (0.010)	-0.007 (0.010)	-0.004 (0.011)	0.009 (0.017)
voucher \times Pr(hosp costs > 0)		-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
fraction safe lotteries chosen			-0.094** (0.040)	-0.111** (0.046)	-0.224*** (0.067)
trust game: share sent				0.078* (0.043)	0.139** (0.061)
Constant	0.129 (0.096)	0.109 (0.097)	0.156 (0.096)	0.058 (0.112)	-0.022 (0.168)
Observations	884	884	874	679	313

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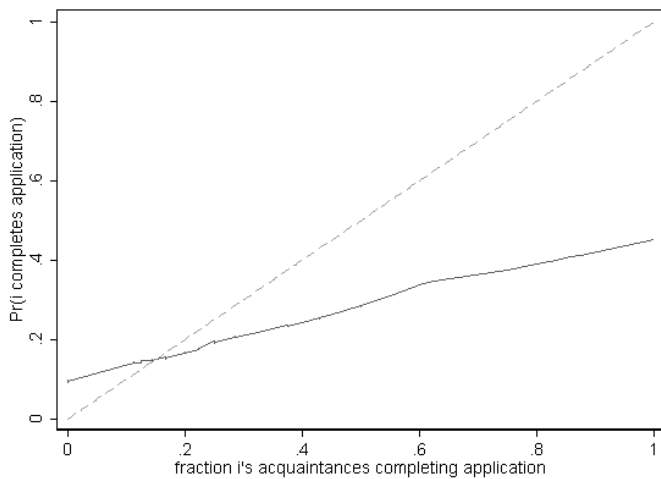
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Peer effects: Motivation



Peer effects: Identification

- ▶ Correlated adoption among friends is a case of Manski's (1993) reflection problem:
 - ▶ endogenous effects
 - ▶ contextual effects
 - ▶ correlated effects
- ▶ Resolved here by using friends' prices as instrument for their decisions.
- ▶ Estimate linear-in-means model

$$y_i = \beta_0 + \beta_p p_i + \beta_t t_i + \theta y_j + e_{ij} \quad (5.1)$$

instrumenting y_j with p_j , for all ij pairs defined by a given network metric.

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Peer effects: IV results

	(1)	(2)	(3)	(4)	(5)
	Acq	Acq	Delegate	Funeral	Microcredit
applied _j	-0.0928 (0.138)	-0.273 (0.211)	-0.418 (0.556)	-0.519 (0.383)	-0.305 (0.215)
voucher (%)	0.00582*** (0.00147)	0.00558*** (0.00155)	0.00526*** (0.00167)	0.00592** (0.00251)	0.00290 (0.00213)
T2: referral	-0.0767* (0.0425)	-0.163*** (0.0593)	-0.262* (0.151)	-0.211** (0.0891)	-0.178*** (0.0685)
T3: education	-0.0233 (0.0490)	-0.0266 (0.0568)	-0.0410 (0.0735)	0.00628 (0.0752)	0.00564 (0.0623)
T2 × applied _j		0.563** (0.243)	0.717 (0.660)	0.832* (0.440)	0.570** (0.280)
Constant	0.157*** (0.0431)	0.197*** (0.0584)	0.247* (0.133)	0.237*** (0.0897)	0.216*** (0.0693)
Observations	5924	5924	725	1913	2920

Standard errors clustered by tea centre.

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- ▶ Demand is remarkably sensitive to price.
 - ▶ Bad news: premiums have just been raised.
- ▶ We find only limited, and somewhat fragile, evidence of selection on subjective health expectations.
 - ▶ Apparent fragility of reduced-form results may arise because theory predicts a non-monotonic relationship between risk and demand (when trust an issue).
 - ▶ Role of risk and trust is consistent with theory and the empirical literature.
- ▶ Peer effects are generally weak—perhaps even negative—but strengthened by the referral treatment.








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References I

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