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 *un*likely 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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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:

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

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Survey design

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.
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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 tasks consists of two lotteries, a 'risky' choice with payoffs of (300,0) and a 'safe' choice with payoffs of (100,50).

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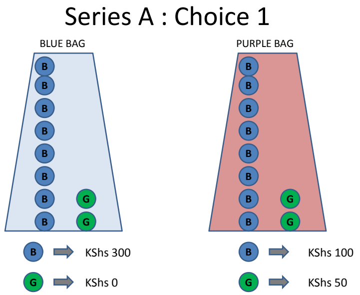

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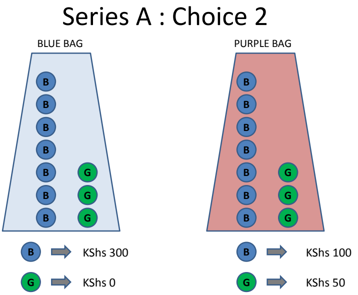

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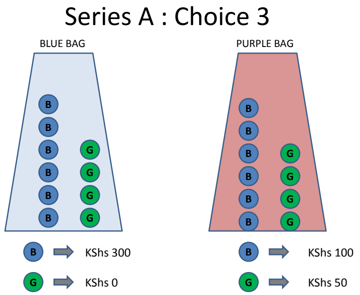

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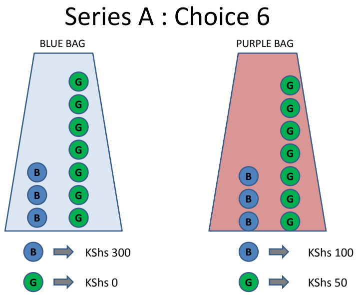
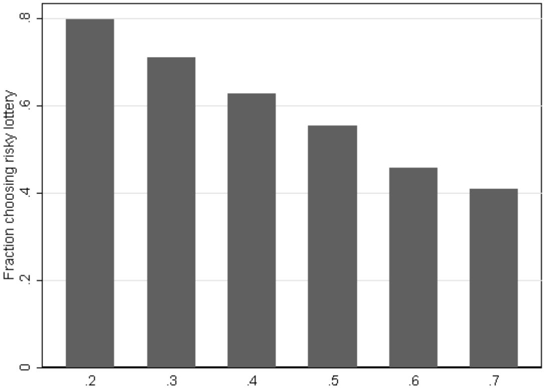


Measuring risk attitudes

Gamble-choice outcomes



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- 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.
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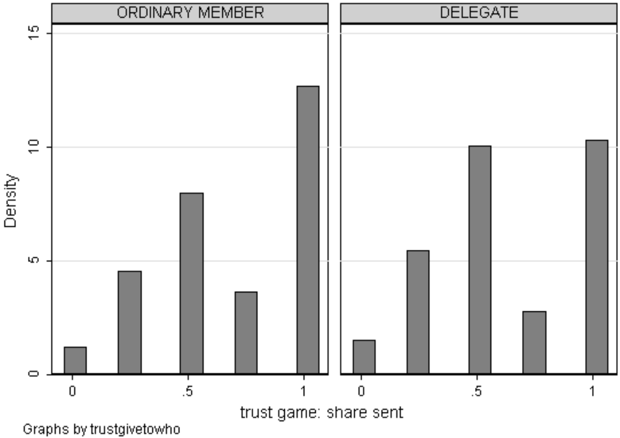

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- We adapt approach of Manski (2004), Attanasio (2009) to measure subjective probability distribution over hospitalization costs.
- In two steps:
  1. Probability of non-zero hospitalization costs
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- Median expected hospitalization expenditure KShs 11,389 (sd 93,883). (Median monthly consumption KShs 13,431.)
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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.
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- 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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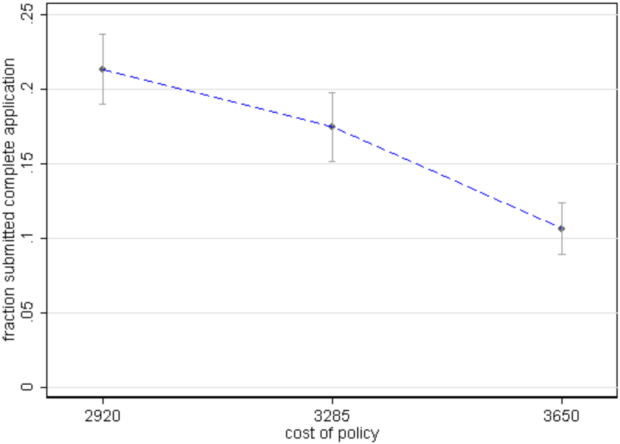
Insurance adoption

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

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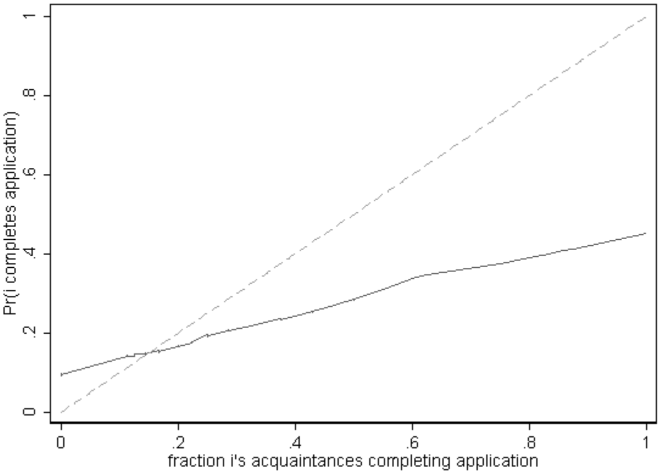
Peer effects: Motivation



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

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

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

Standard errors clustered by tea centre.

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Discussion

- 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).
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