Altruism, Insurance, and Costly Solidarity Commitments

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Motivation

- How should we understand human nature?
- Transfers w/n social solidarity networks have long been observed to play a central role in village economies.
- Dominant framework: self-enforcing informal insurance among self-interested agents. (Coate and Ravallion, 1993; Townsend, 1994; etc.)
- Additionally, social taxation, a self-interested norm, increases incentive to hide income. (Jakiela and Ozier, 2016; Squires, 2017)
- Important differences in policy implications of two views.

- **Key Common, Testable Public Observability Assumption:** Inter-hh transfers increase with public income shocks but are invariant wrt private ones. If false, then need to adapt canonical model of inter-hh transfers.

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In This Paper

- Study patterns of inter-hh transfers in 4 Ghana villages
    - Experiment w/repeated public and private iid cash prizes
- First, test 2-part public observability hypothesis implied by models based on self-interested mechanisms alone:
    1. Reject null that publicly observable income shocks have no impact on interhh transfers?
    2. Fail to reject null that private (unobservable) income shocks have no impact on interhh transfers?

In This Paper

- Empirical evidence inconsistent w/public observability hypotheses that follow from dominant framework:
  1. No signif. response of (number, avg or total value of) interhh transfers to publicly observable income shocks
  2. Signif. positive impact of private shocks on (number, avg and total value of) interhh transfers

  Implication: purely self-interested model insufficient.
- Further:
  3. Only transfers from private income shocks get directed towards neediest hhs.
  4. Giving shuts down when network gets too large.
  5. Significant but incomplete risk pooling overall, but effectively complete in special cases

In This Paper

- Second, since a purely self-interested model won't suffice, we update canonical model of dynamic self-enforcing insurance contracts to allow for:
  - (Impurely) altruistic preferences w/diminishing returns to giving and costly gift giving.
  - Social pressures endogenous to income observability
- This model more realistically allows multi-functional social solidarity networks in which people:
  1. use social networks to smooth consumption against idiosyncratic shocks.
  2. face social pressures to surrender scarce resources.
  3. act on altruistic preferences.
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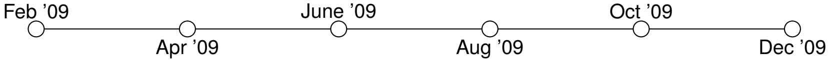
Key implications of multi-functional network model:

- Avg gift size bigger after private than public shocks.
- Private income shocks used more progressively b/c social pressures from public income shocks can crowd out altruistic motives.
- Public income shocks only shared if hh network is small: "shutdown hypothesis".
- Limited risk pooling holds overall, but full risk pooling model holds in special case of median network size.
- Policies that aim to make transfers transparent may unintentionally erode local moral codes.

Empirical tests w/RCT data support these more refined hypotheses, w/standard model as a special case.

Empirical Setting Data

- Head and Spouse of 320 HHs surveyed bimonthly in 4 villages:



- Baseline mapping of gift-giving networks
- Experimental Variation: idiosyncratic lottery winnings
    - Publicly revealed winners (20 per round)
    - Privately revealed winners (20 per round)
- Self-reported transfer behavior and hh consumption

Empirical Setting

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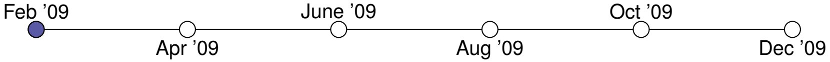

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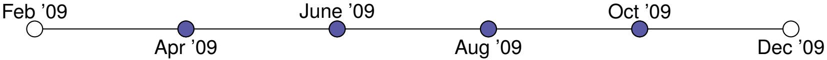

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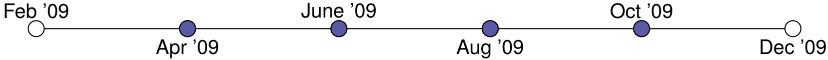
Public Lotteries

Private Lotteries

Lotteries

Private and Public



10 Cash Prizes Per Village
- 5 Private (GH¢10, 20, 35, 50, 70)
- 5 Public (GH¢10, 20, 35, 50, 70)

	N	Mean	Sd
Own Lottery Winnings (GH¢):			
Won in Private	1,251	0.06	0.24
Won in Public	1,251	0.06	0.25
Value of Private Cash Prize	1,251	2.35	10.52
Value of Public Cash Prize	1,251	2.29	10.45

Over course of year 42% indivs and 62% hhs won ≥ 1

Gift Giving

	N	Mean	Sd	5 p-tile	95 p-tile
Fixed Over Time:					
HH size	315	6.66	2.64	3	11
Cash Gifts Given (last 2 months, GH¢):					
Number	1,561	0.74	1.22	0	3
Value (Total)	1,561	9.77	62.73	0	35
Value (Conditional on Giving)	615	24.79	98.11	1	80

Gift-giving Behavior

estimation strategy

$$y_{itk} = \alpha + \beta_v \text{Private}_{it} + \beta_b \text{Public}_{it} + \text{hh}_i + \text{r}_{tk} + \epsilon_{it}$$

- Household i, Round t, Village k
- $Private_{it} = \begin{cases} 1 \text{ if won lottery} \\ 0 \text{ otherwise.} \end{cases}$
- $\mathbf{y_{itk}}$: Value (Total), Value (Average), N Gifts Given
  - Log transformation
  - Bounded below by zero ⟹ Tobit estimator
  - robustness check with Poisson estimator on N

Private Income Increases Gift-Giving

experimental results

		Gift Giving		
Dependent Variable:		Value (Total) (1)	Value (Average) (2)	Number (3)
Randomized Explanatory Variables				
Value of Private Cash Prize	β_v	0.149^{**}	0.129^{**}	0.166^{***}
		(0.069)	(0.055)	(0.057)
Value of Public Cash Prize	β_b	0.00789	-0.0265	0.0639
		(0.071)	(0.057)	(0.058)
Household FE		Yes	Yes	Yes
Round $\times$ Village FE		Yes	Yes	Yes
P-value: $\beta_v = \beta_b$		0.15	0.05	0.21
P-value: $\beta_v <= \beta_b$		0.08	0.02	0.10
Left-censored Obs.		946	946	946
Observations		1,561	1,561	1,561

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. The dependent variable equals log total value of cash gifts given in household in column 1; log average value of cash gift given in column 2; number of gifts given in column 3. Value of Private/Public Cash prize is divided by 10 $\in \{0, 1, 2, 3.5, 5, 7\}$. Tobit estimator used in all columns with a lower bound of zero.

Intensity

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Intensity

Key Takeaways

1. Strongly reject 'no giving from private winnings' null
2. Cannot reject 'no giving from public winnings' null
3. Each result inconsistent with informal insurance or social taxation models based solely on self-interested behavior.

Need a more encompassing theory!

Enriched Model

modify foster and rosenzweig (REStat 2001)

- Standard 2 agent stochastic dynamic game - i.e., insurance contract with limited commitment.
- Gift requests increase in network size and observability of income - i.e.,social taxation exists
- Impurely altruistic preferences for others' utility
  - Implies giving even with private income.
  - Warm glow decreases in number of gifts
  - Maintaining solidarity link requires costly effort.
- **NEW IMPLICATION: Shut-down hypothesis:** HHs w/ big networks do not give from observable income shocks.
- **NEW IMPLICATION: Progressive altruistic transfers:** Private income shocks spark altruistic transfers to least well-off households.

Model Setup

build on foster and rosenzweig (2001)

- **Environment**
  - 2 households: 1 and 2
  - Period t state-dependent income: $y_i(s_t)$, $i \in \{1, 2\}$
    - $s_t \in S$, the set of all states
    - h_t, history of state sequences
  - HH i consumption: $c_{it}(h_t)$
- **Preferences:**
  - Concave utility in consumption: $u_i(c_{it}(h_t))$
  - $0 \leq \gamma < 1$: Altruistic preferences for other's utility
  - Maximize lifetime discounted ($\delta < 1$) utility surplus, U_i
- **Solution:**
  - Transfers from 1 to 2, $\tau(h_t)$
  - Dynamic Limited Commitment Nash Equilibrium

Model Setup

Our modifications

- **Environment**
  - Gift network size: $g_i \in \mathbb{Z}^+$
  - Three types of income for each household:
    1. No shock to income
    2. Unobservable increase in income
    3. Observable increase in income
- **Preferences**
  - $\gamma(h_t, g_i)$: altruism concave function in network size
  - $\alpha(g_i)$: cost of maintaining gift-ties
- **Assumptions:**
  1. More gift requests when income is observable
  2. Altruism decreasing in gifts-given
  3. Costly network maintenance

Formal Model Predictions

Formal Model

- Single-period utility (HH 1):

$$u_1(y_1(s_t) - (h_t)) + \gamma(h_t, g_1)u_2(y_2(s_t) + \tau(h_t))$$

$$U_1^s(U_2^s) = \max_{\tau_s,(U_1^r,U_2^r)_{r=1}^S} \quad u_1(y_1(s) - \tau_s) - u_1(y_1(s))$$

$$+ \quad \gamma_1(g_1(s))u_2(y_2(s) + \tau_s) - \gamma_1(g_1(s))u_2(y_2(s))$$

$$- \quad \alpha_1(g_1) + \delta \sum \pi_{sr} U_1^r(U_2^r) \text{ subject to}$$

$$\begin{aligned} \lambda: &\quad \text{Promise keeping} \\ \delta\pi_{sr}\mu_r: &\quad U_1^r(U_2^r) \geq \underline{U}_1^r = 0 \quad \forall r \in S \\ \delta\pi_r\phi_r: &\quad U_2^r \geq \underline{U}_2^r = 0 \quad \forall r \in S \\ \psi_1, \psi_2: &\quad Non-negativity \end{aligned}$$

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State Space

Five States - matching the empirical context

1. *zz* - Neither household wins a cash lottery
2. *zb* - Household 1 wins a **puBlicly** revealed prize.
3. *zv* - Household 1 wins a **priVately** revealed prize.
4. *bz* - Household 2 wins **puBlicly**
5. *vz* - Household 2 wins **priVately**

When income is observable, more gifts requested

$$p_1(zb) > p_1(s') \qquad \text{for all } s' \neq \{zb\} \text{ and}$$
$$p_2(bz) > p_2(s'') \qquad \text{for all } s'' \neq \{bz\}$$

Predictions

Prediction 1 (The Shut-down Hypothesis) *Large gift-giving networks shut down giving especially in public winnings.*

Prediction 2 (Private = Higher Average Transfer Value)
$\tau_{zv} > \tau_{bz}$ *on average.*

Prediction 3 (Public = Higher Number of Gifts Given)
$\sum_{j=1}^{N} \mathbb{1}(\tau_{ij}(zb) \neq 0) > \sum_{j=1}^{N} \mathbb{1}(\tau_{ij}(zv) \neq 0)$

Prediction 4 (Public = Larger Total Transfers) *Prior to shut-down* $\sum_{j=1}^{N} \mathbb{1}\tau_{ij}(zb) > \sum_{j=1}^{N} \mathbb{1}\tau_{ij}(zv)$

Prediction 5 (Consumption Increasing in Others' Winnings)
Specifically in private winnings: $c_1(vz) > c_1(zz)$

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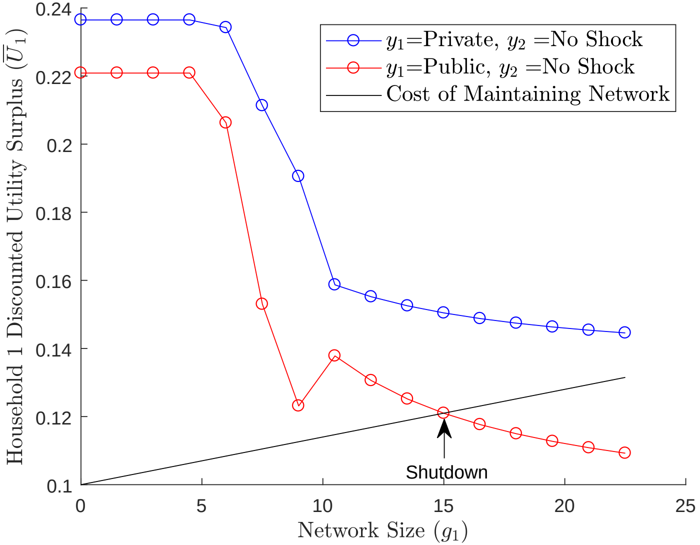
Prediction 1 - Shut-down Hypothesis



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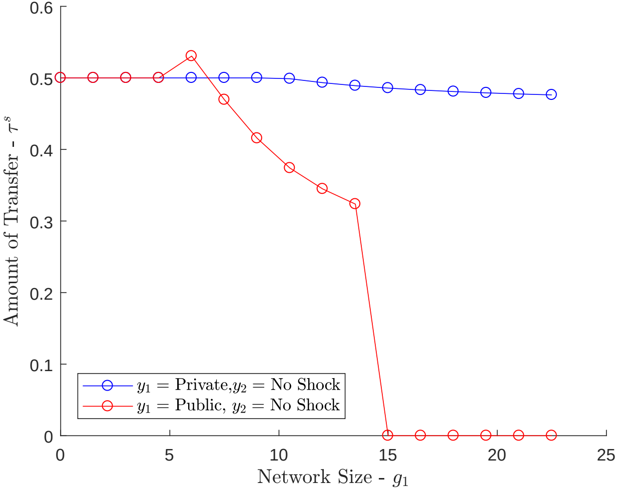
Prediction 2 and 3

Private → larger average gifts; Public → larger n gifts (before shutdown)



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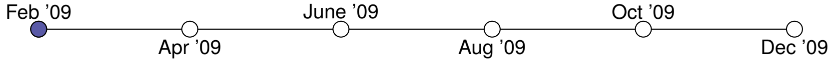
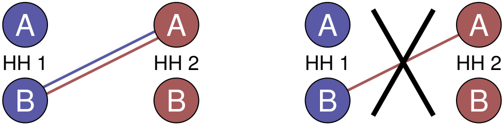
Network Data

Presentation Backup

Reciprocal Gift Networks



- "Have you given gifts to XX (for all in sample)?" (receive)



- **Reciprocal link:** both households indicate at least one reciprocal connection to someone in the other household.
  - 3,648 out of 27,303 possible links (13.4%)

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Household Summary Statistics

For the Enhanced Model

				Percentile	
	N	Mean	Sd	5th	95th
Network Size:					
N of HH in Network	315	11.40	10.08	0	32
Food Consumption (last month, GH¢):					
PC Food	1,462	24.20	17.54	7.43	52.88
PC Purchased Food	1,462	18.14	16.59	3.75	45.20
Network Average Lottery Winnings (GH¢):					
Average Value of Private Network Prize	1,257	2.30	5.24	0	9.23
Average Value of Public Network Prize	1,257	2.08	3.93	0	8.75
Adjusted Average Value (Private)	1,257	0.20	1.20	0	0.63
Adjusted Average Value (Public)	1,257	0.20	1.10	0	0.74

Adjusted Network Winnings

$$\overline{\text{Private}}'_{it} = \sum_{j=1}^{N} \frac{\frac{\text{Private}_j}{\sum_{k=1}^{N} \mathbb{1}(g_{jk}==1)} \times \mathbb{1}(g_{ij} == 1)}{\sum_{j=1}^{N} \mathbb{1}(g_{ij} == 1)}$$

Model Predictions

U Figure τ Figure

gift-giving behavior with the shut-down effect

$$y_{itk} = \alpha + \beta_v \text{Private}_{it} + \beta_b \text{Public}_{it} + \text{hh}_i + \text{r}_{tk} + \epsilon_{it}$$
$$+ \beta_{vg} \text{Private}_{it} \times \text{Network}_i + \beta_{bg} \text{Public}_{it} \times \text{Network}_i$$
$$+ \text{hh}_i + \text{r}_{tk} + \epsilon_{it}$$

$\mathbf{y_{it}}$: N Gifts Given, Value (Total), Value (Average)

Network: Reciprocal Gift-Network Size

Predictions			
Shutdown	Value (Average)	N Gifts Given	Total Value
	$\beta_b < \beta_v$ ✓	$\beta_b ? \beta_v$ =	$\beta_b ? \beta_v$ = (<)
$\beta_b > 0, \quad \beta_{bg} < 0$		$\beta_b > \beta_v$	$\beta_b \geq \beta_v$

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Gift-giving with Shut-down Hypothesis

interacting network size

		Gift Giving		
Dependent Variable:		Value (Total) (1)	Value (Average) (2)	Number (3)
Randomized Explanatory Variables With Network Size Interaction				
Value of Private Cash Prize	$\beta_v > 0$	0.296***	0.199**	0.226**
		(0.114)	(0.092)	(0.094)
Value of Private Cash Prize × N	$\beta_{vg} \leq 0$	-0.012*	-0.005	-0.005
		(0.007)	(0.006)	(0.006)
Value of Public Cash Prize	$\beta_b > 0$	0.264**	0.115	0.420***
		(0.111)	(0.088)	(0.091)
Value of Public Cash Prize × N	$\beta_{bg} < 0$	-0.029***	-0.016**	-0.041***
		(0.010)	(0.008)	(0.008)
Household FE		Yes	Yes	Yes
Round × Village FE		Yes	Yes	Yes
$H_0: \beta_v = \beta_b$		0.84	0.50	0.13
$H_0: \beta_v + \beta_{vg} \times 5 = \beta_b + \beta_{bg} \times 5$		0.32	0.15	0.88
$H_0: \beta_v + \beta_{vg} \times 10 = \beta_b + \beta_{bg} \times 10$		0.05	0.02	0.05
$H_0: \beta_v + \beta_{vg} \times 20 = \beta_b + \beta_{bg} \times 20$		0.02	0.02	0.00
N at Shut Down		9.15	7.27	10.25
Left-censored Obs.		946	946	946
Observations		1,561	1,561	1,561

Note: $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log total value of cash gifts given in household in column 1; log average value of cash gift given in column 2; number of gifts given in column 3. Value of Private/Public Cash prize is divided by 10 = $\in \{0, 1, 2, 3.5, 5, 7\}$. Tobit estimator used in all columns. Null hypotheses are tested using Wald tests of equivalence specified for network size (N) of 0, 5, 10 and 20. P-values reported under each column for each of the hypotheses. N denotes network size. N at Shutdown is equal to $-\frac{\beta_b}{\beta_{bg}}$.

Gift-giving with Shut-down Hypothesis

Interacting network size

Dependent Variable:		Gift Giving: Value (Total) (1)	Gift Giving: Value (Average) (2)	Gift Giving: Number (3)
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$H_0: \beta_v + \beta_{vg} \times 10 = \beta_b + \beta_{bg} \times 10$		0.05	0.02	0.05
$H_0: \beta_v + \beta_{vg} \times 20 = \beta_b + \beta_{bg} \times 20$		0.02	0.02	0.00
N at Shut Down		9.15	7.27	10.25
Left-censored Obs.		946	946	946
Observations		1,561	1,561	1,561

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log total value of cash gifts given in household in column 1; log average value of cash gift given in column 2; number of gifts given in column 3. Value of Private/Public Cash prize is divided by 10 = $\in \{0, 1, 2, 3.5, 5, 7\}$. Tobit estimator used in all columns. Null hypotheses are tested using Wald tests of equivalence specified for network size (N) of 0, 5, 10 and 20. P-values reported under each column for each of the hypotheses. N denotes network size. N at Shutdown is equal to $-\frac{\beta_b}{\beta_{bg}}$.

Gift-giving with Shut-down Hypothesis

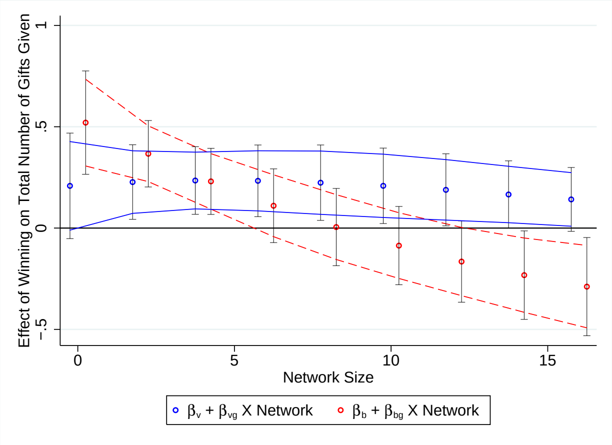
interacting network size

		Gift Giving		
Dependent Variable:		Value (Total) (1)	Value (Average) (2)	Number (3)
Randomized Explanatory Variables With Network Size Interaction				
Value of Private Cash Prize	$\beta_v > 0$	0.296***	0.199**	0.226**
		(0.114)	(0.092)	(0.094)
Value of Private Cash Prize × N	$\beta_{vg} \leq 0$	-0.012*	-0.005	-0.005
		(0.007)	(0.006)	(0.006)
Value of Public Cash Prize	$\beta_b > 0$	0.264**	0.115	0.420***
		(0.111)	(0.088)	(0.091)
Value of Public Cash Prize × N	$\beta_{bg} < 0$	-0.029***	-0.016**	-0.041***
		(0.010)	(0.008)	(0.008)
Household FE		Yes	Yes	Yes
Round × Village FE		Yes	Yes	Yes
$H_0 : \beta_v = \beta_b$		0.84	0.50	0.13
$H_0 : \beta_v + \beta_{vg} \times 5 = \beta_b + \beta_{bg} \times 5$		0.32	0.15	0.88
$H_0 : \beta_v + \beta_{vg} \times 10 = \beta_b + \beta_{bg} \times 10$		0.05	0.02	0.05
$H_0 : \beta_v + \beta_{vg} \times 20 = \beta_b + \beta_{bg} \times 20$		0.02	0.02	0.00
N at Shut Down		9.15	7.27	10.25
Left-censored Obs.		946	946	946
Observations		1,561	1,561	1,561

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log total value of cash gifts given in household in column 1; log average value of cash gift given in column 2; number of gifts given in column 3. Value of Private/Public Cash prize is divided by 10 = $\in \{0, 1, 2, 3.5, 5, 7\}$. Tobit estimator used in all columns. Null hypotheses are tested using Wald tests of equivalence specified for network size (N) of 0, 5, 10 and 20. P-values reported under each column for each of the hypotheses. N denotes network size. N at Shutdown is equal to $-\frac{\beta_b}{\beta_{bg}}$.

Non-parametric shut-down hypothesis

Total Value



Note: Dependent variable equals number of gifts given. Includes 2nd and 3rd order polynomial interactions on network-size variable. Dots represent point estimates of $\beta_b + \beta_{bg} \times N + \beta_{bg^2} \times N^2 + \beta_{bg^3} \times N^3$ (repeat for private, β_v). Blue line represents 90% confidence interval for linear combination of private coefficients; dotted red line represents the 90% confidence interval for linear combintation of public coefficients. Bars represent 95% confidence intervals. Plots of public coefficients offset by one for ease of viewing.

Transfers to Relatively Poor Households

dyadic analysis

Equation

		Gift Giving Within Dyad: From i to j	
Dependent Variable:		Amount (1)	Number (2)
$(\text{Food}_{it} - \text{Food}_{jt})$	γ_F	0.073	0.029
		(0.204)	(0.106)
Randomized Explanatory Variables With Interactions			
Value in Private	β_v	0.182	0.136*
		(0.153)	(0.078)
Value in Private $\times$ $(\text{Food}_{it} - \text{Food}_{jt})$	β_{vF}	0.305**	0.117**
		(0.127)	(0.058)
Value in Public	β_b	-0.286	-0.234
		(0.265)	(0.166)
Value in Public $\times$ $(\text{Food}_{it} - \text{Food}_{jt})$	β_{bF}	-0.098	-0.055
		(0.064)	(0.042)
Round $\times$ Village FE		Yes	Yes
All Dyads Included		No	No
P-value: $\beta_v = \beta_b$		0.12	0.05
P-value: $\beta_{vF} = \beta_{bF}$		0.00	0.01
Left-censored Obs.		16,190	
Observations		16,270	16,270

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log total value of (cash) gifts given from household i to household j in column 1 — estimated using Tobit with observations censored to the left by zero. Number of gifts in column 2, estimated using Poisson estimator. Value in Private/Public $\in \{0, 1, 2, 3.5, 5, 7\}$. $\text{Food}_{it} - \text{Food}_{jt}$ is difference in log per capita food consumption.

Transfers to Relatively Poor Households

dyadic analysis Equation

		Gift Giving Within Dyad: From i to j	
Dependent Variable:		Amount	Number
		(1)	(2)
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		(0.204)	(0.106)
Randomized Explanatory Variables With Interactions			
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		(0.153)	(0.078)
Value in Private $\times$ $(\text{Food}_{it} - \text{Food}_{jt})$	β_{vF}	0.305^{**}	0.117^{**}
		(0.127)	(0.058)
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		(0.265)	(0.166)
Value in Public $\times$ $(\text{Food}_{it} - \text{Food}_{jt})$	β_{bF}	-0.098	-0.055
		(0.064)	(0.042)
Round $\times$ Village FE		Yes	Yes
All Dyads Included		No	No
P-value: $\beta_v = \beta_b$		0.12	0.05
P-value: $\beta_{vF} = \beta_{bF}$		0.00	0.01
Left-censored Obs.		16,190	
Observations		16,270	16,270

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log total value of (cash) gifts given from household i to household j in column 1 — estimated using Tobit with observations censored to the left by zero. Number of gifts in column 2, estimated using Poisson estimator. Value in Private/Public $\in \{0, 1, 2, 3.5, 5, 7\}$. $\text{Food}_{it} - \text{Food}_{jt}$ is difference in log per capita food consumption.

Shut-down Hypothesis in Dyadic Data

dyadic analysis Equation

		Gift Giving Within Dyad: From *i* to *j*	
Dependent Variable:		Amount	Amount
		(3)	(4)
Network Size	γ_g	-0.036	-0.017
		(0.027)	(0.018)
Randomized Explanatory Variables With Interactions			
Value in Private	β_v	0.318	0.239
		(0.235)	(0.157)
Value in Private × N	β_{vg}	-0.005	-0.007
		(0.009)	(0.009)
Value in Public	β_b	0.177	0.341**
		(0.399)	(0.164)
Value in Public × N	β_{bg}	-0.034	-0.044***
		(0.025)	(0.016)
Round × Village FE		Yes	Yes
All Dyads Included		No	Yes
P-value: $\beta_v = \beta_b$		0.76	0.64
P-value: $\beta_{vF} = \beta_{bF}$			
Left-censored Obs.		16,190	107,944
Observations		16,270	108,082

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log total value of (cash) gifts given from household *i* to household *j* in columns 3 and 4 — estimated using Tobit with observations censored to the left by zero. Value in Private/Public $\in \{0, 1, 2, 3.5, 5, 7\}$. Analysis only includes dyads in reciprocal gift-giving network at baseline in column 3. All within-sample dyads represented in column 4. Standard errors clustered by dyad. N denotes network size.

Shut-down Hypothesis in Dyadic Data

dyadic analysis Equation

		Gift Giving Within Dyad: From *i* to *j*	
Dependent Variable:		Amount	Amount
		(3)	(4)
Network Size	γ_g	-0.036	-0.017
		(0.027)	(0.018)
Randomized Explanatory Variables With Interactions			
Value in Private	β_v	0.318	0.239
		(0.235)	(0.157)
Value in Private × N	β_{vg}	-0.005	-0.007
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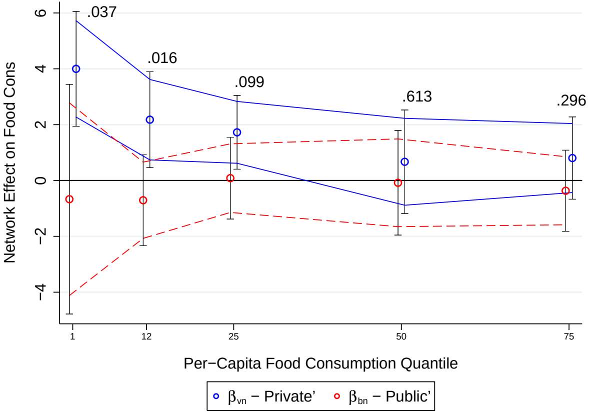
Value in Public	β_b	0.177	0.341**
		(0.399)	(0.164)
Value in Public × N	β_{bg}	-0.034	-0.044***
		(0.025)	(0.016)
Round × Village FE		Yes	Yes
All Dyads Included		No	Yes
P-value: $\beta_v = \beta_b$		0.76	0.64
P-value: $\beta_{vF} = \beta_{bF}$			
Left-censored Obs.		16,190	107,944
Observations		16,270	108,082

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log total value of (cash) gifts given from household *i* to household *j* in columns 3 and 4 — estimated using Tobit with observations censored to the left by zero. Value in Private/Public $\in \{0, 1, 2, 3.5, 5, 7\}$. Analysis only includes dyads in reciprocal gift-giving network at baseline in column 3. All within-sample dyads represented in column 4. Standard errors clustered by dyad. N denotes network size.

Public Income Crowds Out Altruism

quantile regression of food consumption on network winnings

Equation



Note: Results of a simultaneous quantile regression at 1st, 12.5th, 25th, 50th, and 75th quantiles bootstrapped over 1,000 iterations. Dependent variable is log home-produced per capita food consumption over the last month. Quantiles represented on the x axis. Blue dots (lines) show the coefficient estimates (90% confidence interval) on adjusted private network winnings, $\overline{\text{Private}}'_{it}$, at each quantile. Red represents public network winnings, $\overline{\text{Public}}'_{it}$. Blue dots offset by one along x-axis for ease of viewing. The numbers above each point represent the quantile specific p-value of the Wald test $\text{H}_0: \beta_{vn} = \beta_{bn}$.

Additional Results Back

- **Reject Full Insurance:** Using Townsend's (1994) estimation method, reject full insurance within solidarity network in favor of partial risk pooling. Townsend Test
- **Friends vs. Family:** Private winners give to friends, public winners give to family. Friends & Family Table
- **Punishing Defectors:** those who shut-down do not receive gifts either... has dynamic implications. Reciprocity

Test of Full Risk Pooling

Townsend (1994)

Dependent Variable:	Δlog (PC Food)					
	G (1)	F (2)	G $\notin$ F (3)	F $\notin$ G (4)	G $\cap$ F (5)	$\notin$ (G $\cup$ F) (6)
First Difference of Network Average Per Capita Food Consumption						
Δlog(Network PC Food)$_{it}$	0.306***	0.328***	0.102	0.034	0.257***	0.022
	(0.087)	(0.098)	(0.077)	(0.063)	(0.078)	(0.224)
Randomized Explanatory Variables						
Value of Private Cash Prize	-0.001	0.011	0.002	0.013	0.002	0.007
	(0.010)	(0.015)	(0.011)	(0.014)	(0.010)	(0.013)
Value of Public Cash Prize	0.006	0.007	0.014	0.004	0.008	0.004
	(0.012)	(0.011)	(0.013)	(0.011)	(0.013)	(0.011)
$\overline{\text{Private}\|\text{Network}}_{it}$	0.005	0.057	-0.012	0.025	0.014	-0.320**
	(0.027)	(0.043)	(0.030)	(0.021)	(0.023)	(0.156)
$\overline{\text{Public}\|\text{Network}}_{it}$	-0.006	-0.001	0.016	0.006	-0.038	-0.077
	(0.032)	(0.021)	(0.022)	(0.019)	(0.031)	(0.175)
Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Network Definition						
Gift Network	Yes	—	Yes	No	Yes	No
Family Network	—	Yes	No	Yes	Yes	No
Left-censored Obs.	265	268	233	263	245	303
Observations	969	979	844	961	897	1,107

Back-Data Back-Additional

Family vs. Friends

Giving private lottery winnings to friends, not family

Dependent Variable:		Value of Gifts Given (Average)		
Gifts directed to:		All Family (1)	Direct Family (2)	Village Friends (3)
Randomized Explanatory Variable With Network Size Interaction				
Won Private Cash Prize	β_v	-0.298	-1.065	0.875**
		(0.726)	(0.828)	(0.431)
Won Public Cash Prize	β_b	1.912***	2.029***	1.287***
		(0.686)	(0.652)	(0.491)
Won Private Cash Prize × N	β_{vg}	0.0237	0.0442	-0.0157
		(0.044)	(0.046)	(0.029)
Won Public Cash Prize × N	β_{bg}	-0.120**	-0.101**	-0.118**
		(0.051)	(0.049)	(0.048)
Round × Village FE		Yes	Yes	Yes
N at Shutdown		16	20	11
Left-censored Obs.		1,173	1,307	1,340
Observations		1,561	1,561	1,561

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log average value of (cash) gifts given in household. Column 1 consists of gifts to all family, column 2 to direct family members (i.e., siblings, grandparents, parents) who have their own households within the village, column 3 to village friends. Won in Private/Public $\in \{0, 1\}$. Tobit estimator used in all columns. N denotes network size.

Back

Shutdown Reciprocity

Those likely to shutdown did not receive gifts

		Receiving Gifts		
Dependent Variable		Value (Total) (1)	Value (Average) (2)	Number (3)
Lagged Randomized Explanatory Variables With Network Size Interaction				
Won Private in Past?	β_v	0.160	0.121	0.020
		(0.274)	(0.224)	(0.222)
Won Private in Past? × N	β_{vg}	-0.011	-0.007	-0.010
		(0.019)	(0.016)	(0.016)
Won Public in Past?	β_b	0.576**	0.415*	0.543**
		(0.282)	(0.232)	(0.223)
Won Public in Past? × N	β_{bg}	-0.040*	-0.030*	-0.034**
		(0.021)	(0.017)	(0.016)
Round × Village FE		Yes	Yes	Yes
N at Shut Down		14.29	13.96	15.84
Left-censored Obs.		1,292	1,292	1,292
Observations		1,556	1,556	1,556

Note: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent Variable equals log total value of (cash) gifts received per adult in household in column 1; log average value of (cash) gifts received per adult in column 2; number of (cash) gifts received per adult in column 3. Won Private/Public in Past $\in \{0,1\}$ indicates whether household won lottery at any point in current or up to past 3 rounds. Tobit estimator used in all columns. N denotes network size.

Back

Conclusion

	Predictions and Results			
Variables:	All	Value (Average)	N Gifts Given	Food
No Interaction		$\beta_b < \beta_v$ ✓	$\beta_b ? \beta_v =$	✓
Interaction	$\beta_b > 0, \quad \beta_{bg} < 0$ ✓		$\beta_b > \beta_v$ ✓	

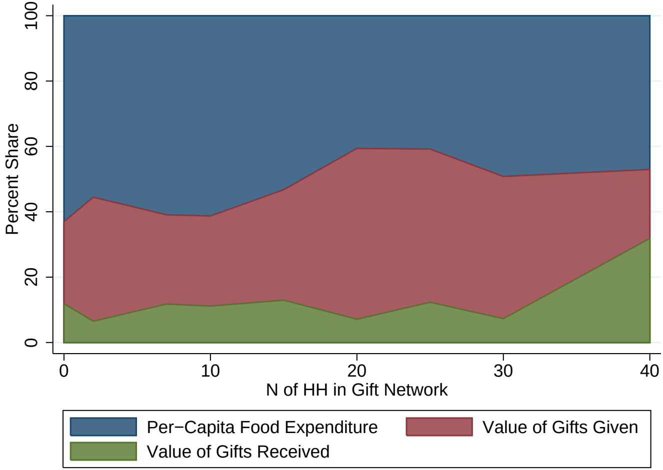
- Results refine our understanding of inter-hh transfers w/n networks.
  - More than just self-interested informal insurance and social taxation; altruism matters.
- Voluntary redistribution towards the needy.
- Social taxation norms induce inefficient redistribution.
- Trade-off between network size and altruistic giving.
- **Policy implications:** Transfer transparency may crowd out altruistic motives that lead to efficient redistribution.

Thank you!

Send comments to :

- cbb2@cornell.edu
- vnourani@mit.edu

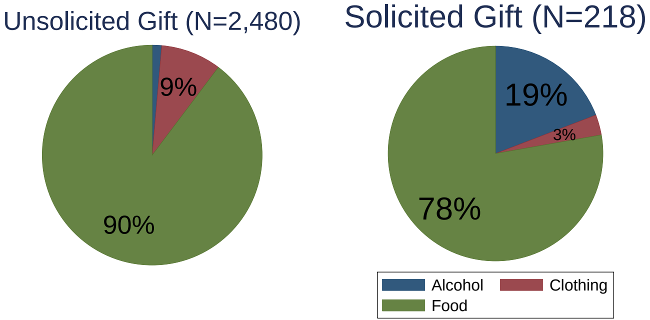
Gifts as Share of Per Capita Food Expenditure



Back

Unsolicited and Solicited Gifts in Our Data

Back



Contract Solution

- Solution: characterize contract using λ (Ligon and Worrall, 1988)

$$\frac{u_1'(y_1(s_t) - \tau(h_t)) + \gamma_1(g_1(h_t))u_2'(y_2(s_t) + \tau(h_t))}{u_2'(y_2(s_t) + \tau(h_t)) + \gamma_2(g_2(h_t))u_1'(y_1(s_t) - \tau(h_t))} = \lambda + \frac{\psi_2 - \psi_1}{u_2'(y_2(s_t) - \tau(h_t)} \qquad (1)$$

$$\lambda(h_{t+1}) = \begin{cases} \underline{\lambda}_s \text{ if } \lambda(h_t) < \underline{\lambda}_s \\ \lambda(h_t) \text{ if } \underline{\lambda}_s \leq \lambda(h_t) \leq \overline{\lambda}_s \\ \overline{\lambda}_s \text{ if } \lambda(h_t) > \overline{\lambda}_s. \end{cases}$$

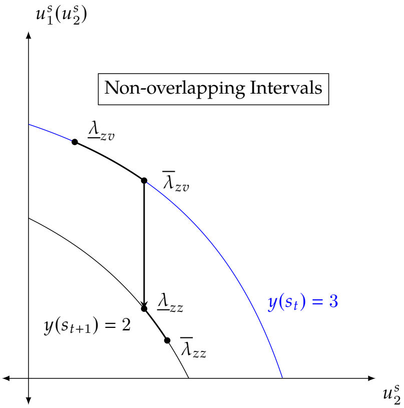
- Depends on nature of overlap of

$$\left[\underline{\lambda}(s), \quad \overline{\lambda}(s)\right] \text{ and } \left[\underline{\lambda}(r), \quad \overline{\lambda}(r)\right]$$

Back

Contract Intuition

Ligon *et. al* (2002)



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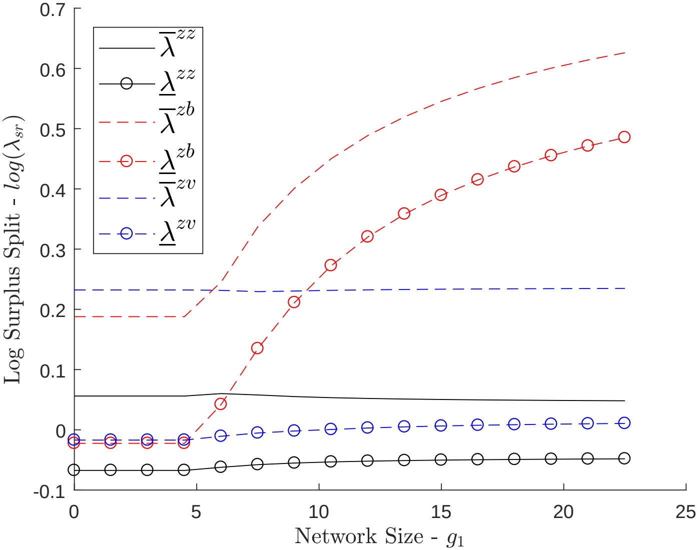
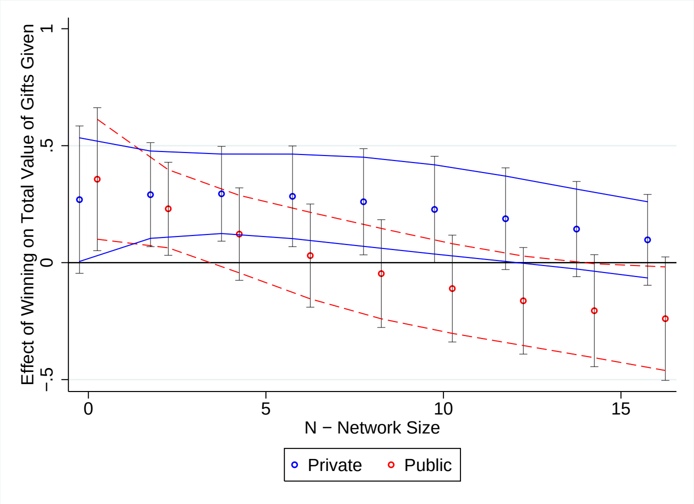
Contract Intervals



Back

Results N Gifts Given

Non-parametric analysis of shut-down hypothesis



Estimation Strategy

own consumption as function of others' winnings

$$y_{it} = \alpha + \beta_v \text{Private}_{it} + \beta_b \text{Public}_{it} + \beta_{vn} \overline{\text{Private}}'_{it} + \beta_{bn} \overline{\text{Public}}'_{it} + \text{hh}_i + \text{r}_t + \epsilon_{it}$$

- $\overline{\text{Private}}'_{it}$ - Adjusted Network Average Value of Winnings
  - $\overline{\text{Private}}'_{it} = \sum_{j=1}^{N} \frac{\frac{\text{Private}_j}{\sum_{k=1}^{N} \mathbb{1}(g_{jk}==1)} \times \mathbb{1}(g_{ij}==1)}{\sum_{j=1}^{N} \mathbb{1}(g_{ij}==1)}$
- Prediction: $\beta_{vn} > \beta_{bn}$ in lower quantiles.

Back

Estimation Strategy

gift-giving within a dyad (i to j)

$$y_{ijtv} = \alpha + \beta_v \text{Private}_{it} + \beta_b \text{Public}_{it} + \text{village}_v + \text{r}_t + \epsilon_{ijt}$$

$$+ \beta_{v\chi} \text{Private}_{it} \times (Food_{it} - Food_{jt})$$

$$+ \beta_{b\chi} \text{Public}_{it} \times (Food_{it} - Food_{jt})$$

$$+ \gamma (Food_{it} - Food_{jt}) + \text{village}_v + \text{r}_t + \epsilon_{ijt}$$

- $\mathbf{y_{ijtv}}$: Log Value$_{ij}$, N Gifts $_{ij}$ (from i to j)

Predictions	
$\beta_v > \beta_b$ (Average Gift Value)	
	$\beta_{v\chi} > 0$ (Gift Amount)

Back

Estimation Strategy

gift-giving within a dyad (i to j)

$$
\begin{aligned}
y_{ijtv} = \alpha &+ \beta_v \text{Private}_{it} + \beta_b \text{Public}_{it} + \text{village}_v + \text{r}_t + \epsilon_{ijt} \\
&+ \beta_{v\chi} \text{Private}_{it} \times (Food_{it} - Food_{jt}) \\
&+ \beta_{b\chi} \text{Public}_{it} \times (Food_{it} - Food_{jt}) \\
&+ \gamma (Food_{it} - Food_{jt}) + \text{village}_v + \text{r}_t + \epsilon_{ijt}
\end{aligned}
$$

- $\mathbf{y_{ijtv}}$: Log Value_{ij}, N Gifts $_{ij}$ (from i to j)

Predictions	
$\beta_v > \beta_b$ (Average Gift Value)	
	$\beta_{v\chi} > 0$ (Gift Amount)