Altruism, Insurance, and Costly Solidarity Commitments

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Motivation

- VERY big picture: understanding human nature
- Inter-hh transfers in village economies as our lens.
- Dominant econ model: self-enforcing informal insurance among self-interested agents. (Coate and Ravallion, 1993; Townsend, 1994; etc.)
- More recently: social taxation, a self-interested norm, increases incentive to hide income. (Jakiela and Ozier, 2016; Squires, 2017)

- **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 self-interested 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

- RCT 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 the canonical model of dynamic self-enforcing insurance contracts to allow for:
  - (Impurely) altruistic preferences w/diminishing returns to giving and costly gift giving.
  - Social tax demands endog to income observability
- This model more realistically allows multi-functional social solidarity networks in which people:
  1. use networks to smooth consumption against shocks.
  2. face social pressures to surrender scarce resources.
  3. act on altruistic preferences.
  4. retain agency to renege on agreements and to resist social pressures

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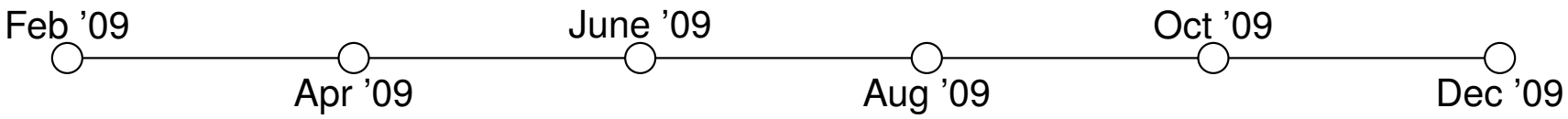
Key implications of multi-functional network model:

- Avg gift size bigger after private than public shocks
- Private income used more progressively b/c social taxation of public income 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
- Shutdown has dynamic consequences on future receipts
- 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 transfers and hh consumption

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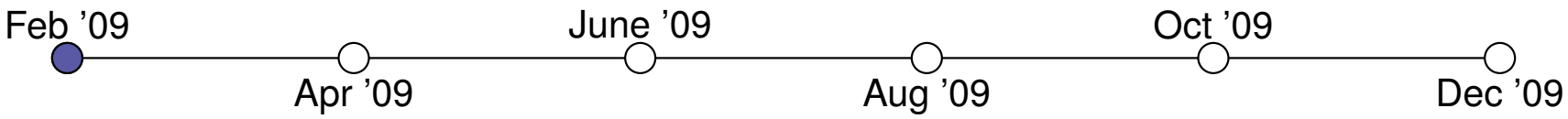

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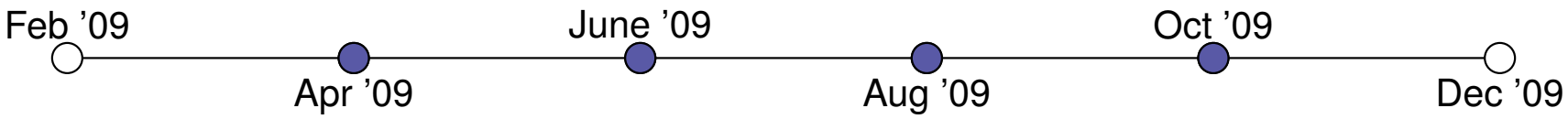

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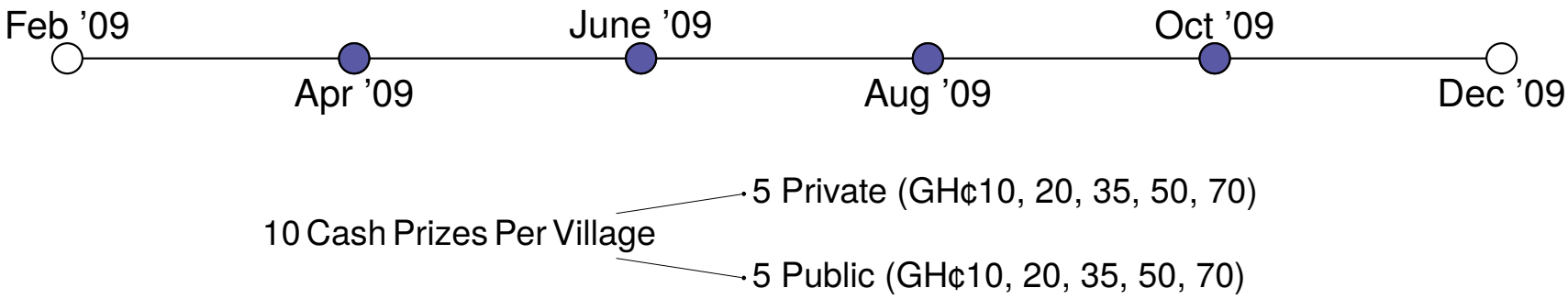
Public Lotteries

Private Lotteries

Lotteries

Private and Public



	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 year 23% hhs won a private cash prize, also 23% for a public cash prize. Only 4% won more than once.

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	1,586	0.41	0.86	0	2
Value (Total)	1,586	3.34	18.16	0	15
Value (Conditional on Giving)	404	13.12	34.19	1	50

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 $\Rightarrow$ Tobit estimator
  - robustness check with Poisson estimator on N

Giving Grows w/Private (not Public) Income

Experimental Results

Dependent Variable:		Gift Giving		
		Value (Total) (1)	Value (Average) (2)	Number (3)
Randomized Explanatory Variables				
Value of Private Cash Prize	β_v	0.222**	0.175**	0.238***
		(0.078)	(0.063)	(0.065)
Value of Public Cash Prize	β_b	0.109	0.0500	0.124*
		(0.087)	(0.070)	(0.072)
Household FE		Yes	Yes	Yes
Round × Village FE		Yes	Yes	Yes
One-sided p-value: $\beta_v > \beta_b$		0.17	0.09	0.12
Left-censored Obs.		1,182	1,182	1,182
Observations		1,586	1,586	1,586

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.

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Key Takeaways

1. Strongly reject 'no giving from private winnings' null
2. Cannot easily 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: Short Summary

modify foster and rosenzweig (REStat 2001)

- Two agent stochastic dynamic game - i.e., insurance contract with limited commitment.
- 3rd party gift requests increase in network size and observable income - i.e., social taxation exists
- Impurely altruistic preferences over others' utility
  - Warm glow marginal gains decrease in gifts given
  - Assume: must treat each person the same
  - Maintaining solidarity link requires costly effort
  - Implication: max lifetime discounted own and (weighted) other's utility
- Dynamic limited commitment Nash eqlm solution

Enriched Model: Short Summary

- **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 Predictions

Prediction 1 (The Shut-down Hypothesis) *Large gift-giving networks shut down giving, esp. after public winnings.*

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

Prediction 3 (Public: Higher No. Gifts Given Pre-Shutdown) *Prior to shutdown* $\sum_{j=1}^{N} \mathbb{1}(\tau_{ij}(zb) \neq 0) > \sum_{j=1}^{N} \mathbb{1}(\tau_{ij}(zv) \neq 0)$

Prediction 4 (Public = Larger Total Transfers Pre-Shutdown) $\sum_{j=1}^{N} \mathbb{1}\tau_{ij}(zb) > \sum_{j=1}^{N} \mathbb{1}\tau_{ij}(zv)$

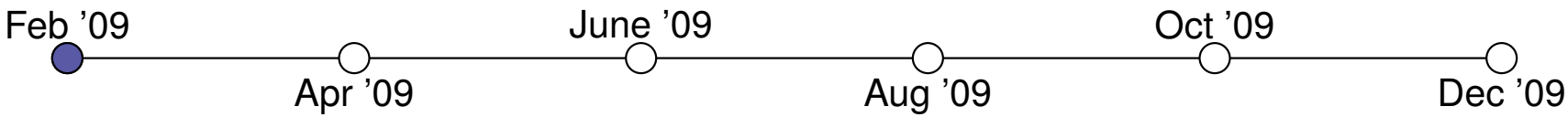
Prediction 5 (Consumption Increasing in Others' Winnings) *Specifically in private winnings:* $c_1(vz) > c_1(zz)$ *and for poor*

Prediction 6 (Dynamic Social Cost of Shutting Down) *Gift receipts decreasing in past public winnings due to shutdown*

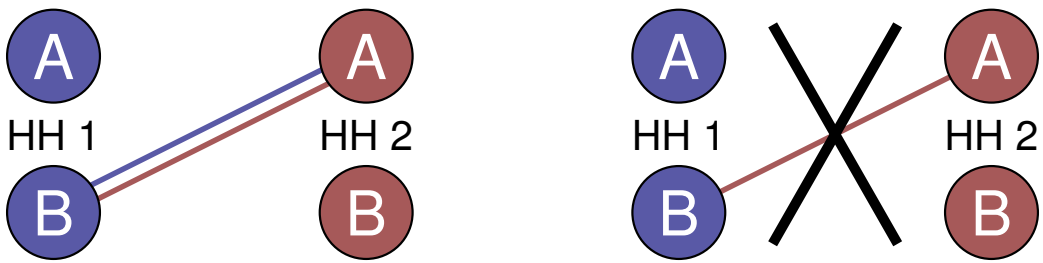
Network Data

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.
  - 3,866 out of 26,795 possible links (14.4%)

Back

Household Summary Statistics

For the Enhanced Model

	N	Mean	Sd	Percentile 5th	Percentile 95th
Network Size:					
N of HH in Network	318	11.30	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	1,272	2.31	5.30	0	9.44
Average Value of Public Network Prize	1,272	2.07	3.92	0	8.75
Adjusted Average Value (Private)	1,272	0.20	1.20	0	0.63
Adjusted Average Value (Public)	1,272	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

Testing Predictions 1-4

Dependent Variable:		Gift Giving		
		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***	0.261**	0.267**
		(0.130)	(0.104)	(0.108)
Value of Private Cash Prize × N	$\beta_{vg} \leq 0$	-0.006	-0.006	-0.003
		(0.008)	(0.006)	(0.006)
Value of Public Cash Prize	$\beta_b > 0$	0.408***	0.1190*	0.471***
		(0.132)	(0.104)	(0.111)
Value of Public Cash Prize × N	$\beta_{bg} < 0$	-0.036***	-0.016*	-0.042***
		(0.012)	(0.009)	(0.011)
Household FE		Yes	Yes	Yes
Round × Village FE		Yes	Yes	Yes
$H_0: \beta_v = \beta_b$		0.541	0.628	0.181
$H_0: \beta_v + \beta_{vg} \times 5 = \beta_b + \beta_{bg} \times 5$		0.793	0.284	0.956
$H_0: \beta_v + \beta_{vg} \times 10 = \beta_b + \beta_{bg} \times 10$		0.139	0.085	0.070
$H_0: \beta_v + \beta_{vg} \times 20 = \beta_b + \beta_{bg} \times 20$		0.014	0.067	0.001
N at Shut Down		11.46	11.62	11.14
Left-censored Obs.		1,182	1,182	1,182
Observations		1,586	1,586	1,586

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 $-\frac{\beta_b}{\beta_{bg}}$.

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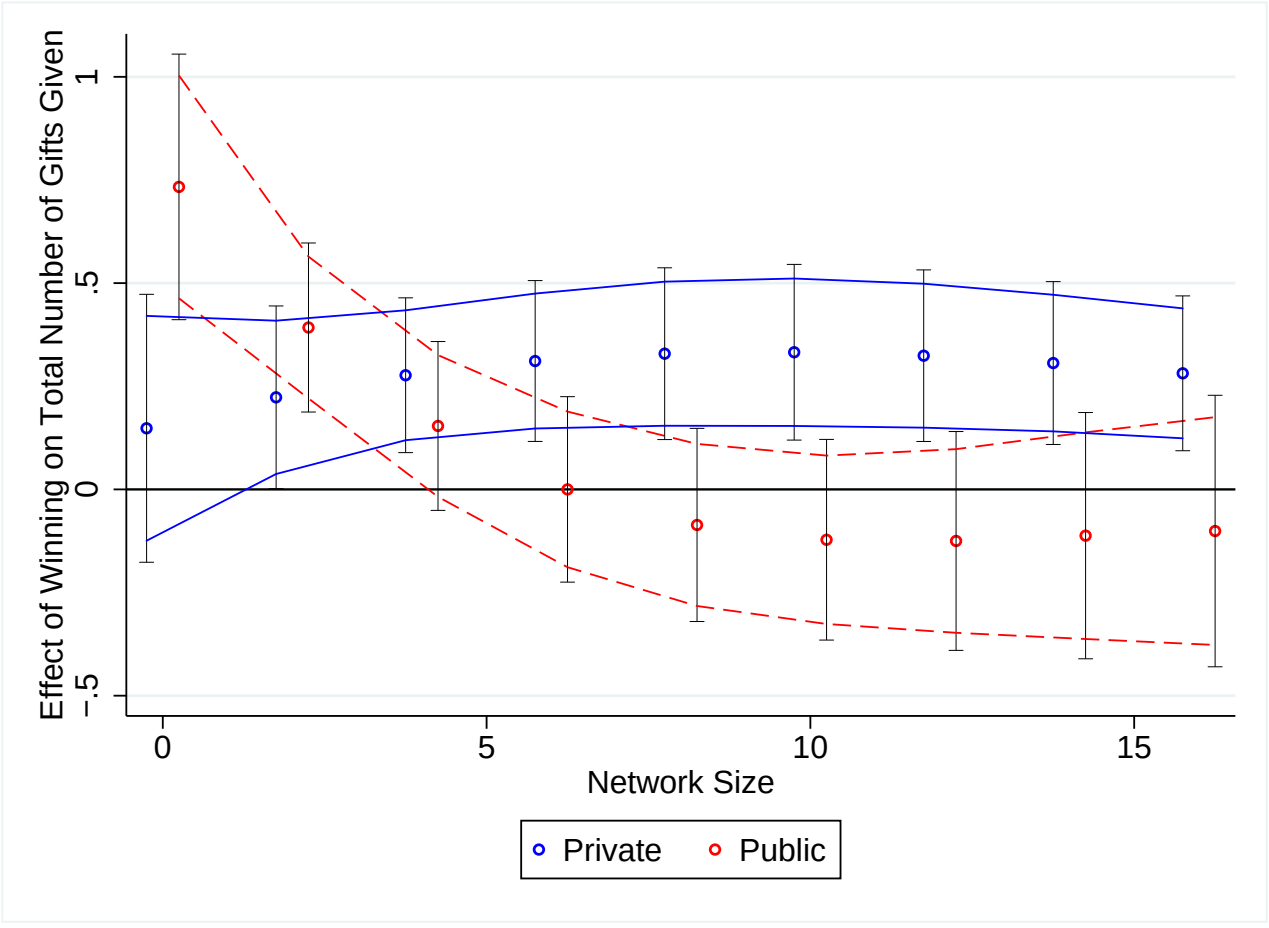
Non-parametric shut-down hypothesis



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.

Public Income Crowds Out Altruism

Testing Prediction 5 w/Dyadic Regressions

Dependent Variable:		Gift Giving Within Dyad: From i to j	
		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.

Public Income Crowds Out Altruism

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Prediction 6: Dynamic Costs of Shutdown

	Receiving Gifts		
Dependent Variable	Value (Total)	Value (Average)	Number
	(1)	(2)	(3)
Lagged Randomized Explanatory Variables With Network Size Interaction			
Won Private in Past?	-0.290	-0.305	-0.431
	(0.503)	(0.351)	(0.533)
Won Private in Past? × N	0.023	0.019	0.021
	(0.032)	(0.022)	(0.034)
Won Public in Past?	0.723	0.420	1.147**
	(0.539)	(0.375)	(0.562)
Won Public in Past? × N	-0.050	-0.027	-0.070*
	(0.036)	(0.025)	(0.038)
Round × Village FE	Yes	Yes	Yes
Left-censored Obs.	1,100	1,100	1,100
Observations	1,586	1,586	1,586

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

Additional Results and Robustness Checks

- **Confirm findings in dyadic regressions**
- **No selfish network formation**
- **Reobust to endogenous networks**
- **No precautionary savings/investment in others**
- **No endogenous opt out**
- **No Coordinated giving**
- **Partial Insurance:** Reject both full and no insurance nulls in favor of partial risk pooling.
- **Friends vs. Family:** Private winners give to friends, public winners give to family and subject to shutdown.

Conclusion

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

- Inter-hh transfers reflect multifunctional social networks. Networks mediate more than just self-interested informal insurance and social taxation; altruism matters.
- Voluntary redistribution towards the needy.
- Social taxation norms induce ineffective redistribution.
- Trade-off between network size and altruistic giving.
- **Policy implications:** Transfer transparency may crowd out altruism that leads to progressive redistribution.

Thank you for your interest and time!

Please send feedback to :

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