Gambling, Saving, and Lumpy Liquidity Needs

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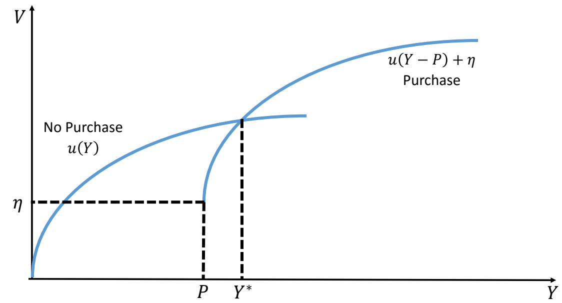
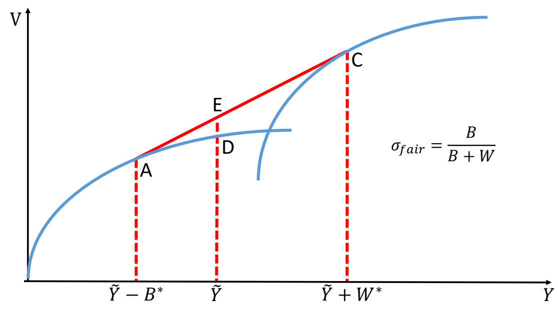
Online Appendix

Appendix A: Additional Tables and Figures

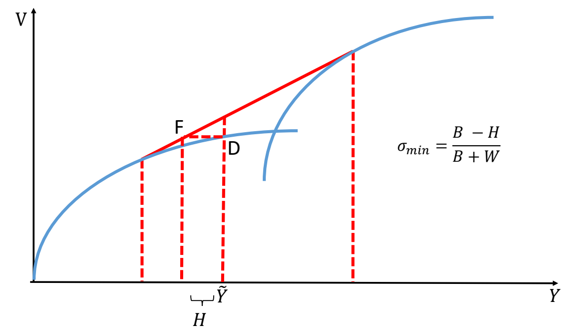
Figure A.1: Indirect Utility with Lumpy Good and Demand for Gambles



(a) Indirect utility with a lumpy good



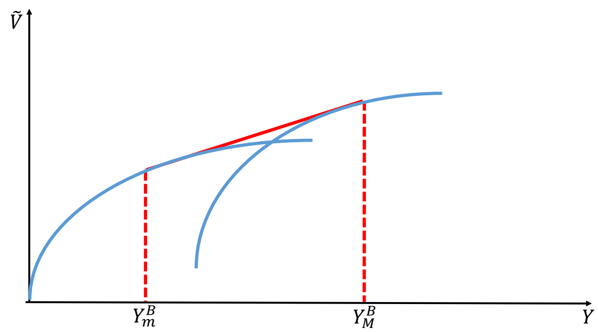
(b) Fair Gambles



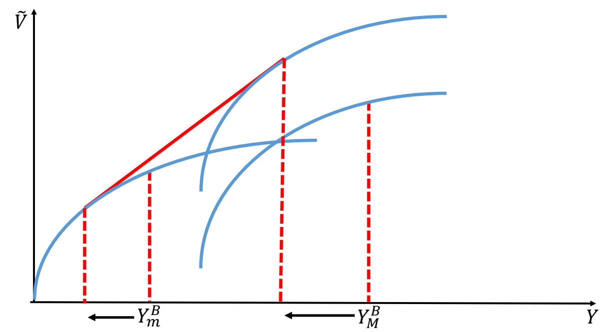
(c) Unfair Gambles

Notes: Panel (a) shows indirect utility from income. For income levels $Y > Y^*$, people will pay a price P to consume L with a utility payoff of η. Maximized utility is determined by income endowment and will be the envelope of the two pieces of the utility function. Panel (b) shows that someone with income level $\tilde{Y}$ will demand a fair gamble that risks reducing his income by B^* for a chance to win W^* with a likelihood of winning, σ. Expected utility from the gamble is at E. Panel (c) shows that there is also demand for *un*fair gambles with the same loss and win amounts but win likelihood as low as σ_{min}.

Figure A.2: Effect of Increased Salience of Lumpy Good on Demand for Gambles



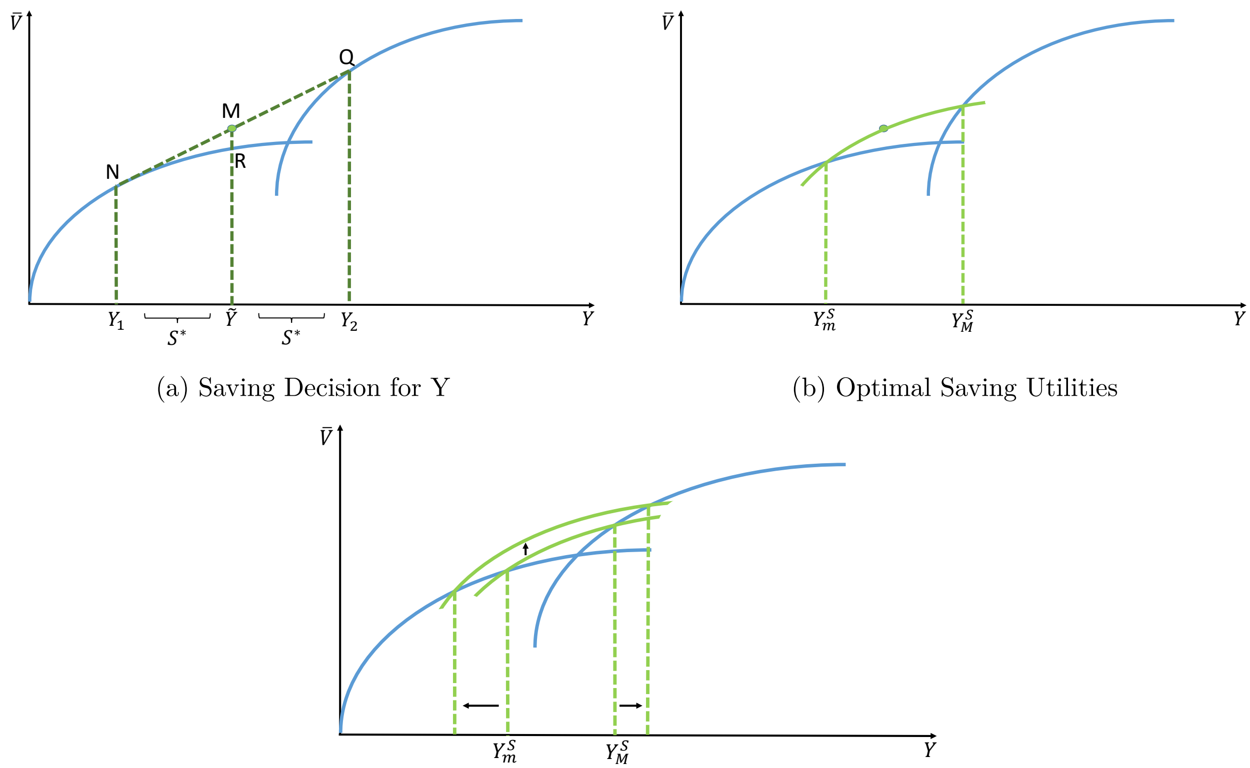
(a) Regular Salience



(b) Increased Salience

Notes: Panel (a) shows demand for gambles with normal salience of the lumpy good. Increasing the lumpy good's salience is modeled as an increase in its valuation represented by the upward shift in the payoff to the lumpy good in Panel (b). This shift in valuation of the lumpy good increases demand for betting among people who could not afford the good.

Figure A.3: Effect of Reduced Saving Ability on Demand for Saving



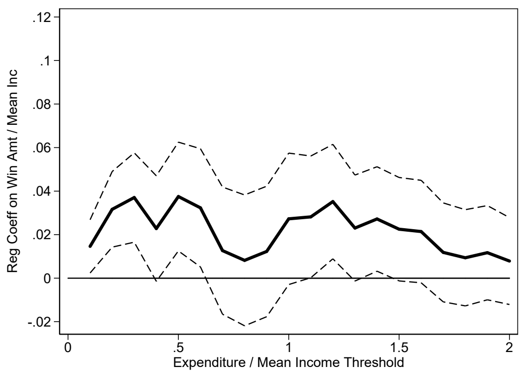
(a) Saving Decision for Y

(b) Optimal Saving Utilities

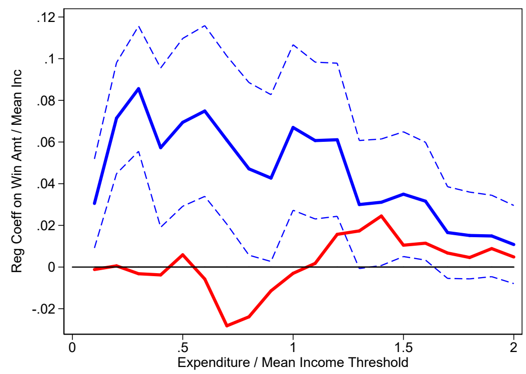
(c) Utility with improved saving ability

Notes: Panel (a) shows the optimal saving decision for an individual with income level $\tilde{Y}$, shifting S^* from T1 to T2 and increasing average expected utility from point R to M. Panel (b) shows optimal saving utilities for all income levels and defines the income range where saving is a welfare improving strategy. Panel (c) shows how this range of incomes and utility from saving increases as saving ability improves.

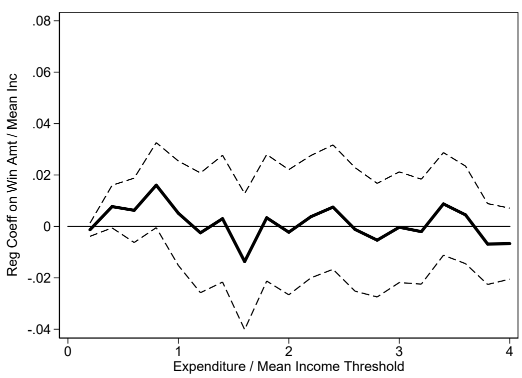
Figure A.4: Effect of Winnings on Purchase Thresholds - Estimation Coefficients



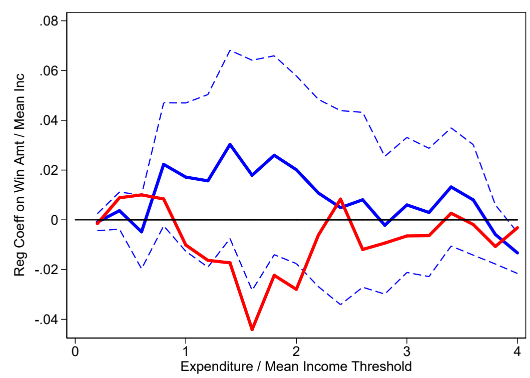
(a) All - Biggest Purchase



(b) Split - Biggest Purchase



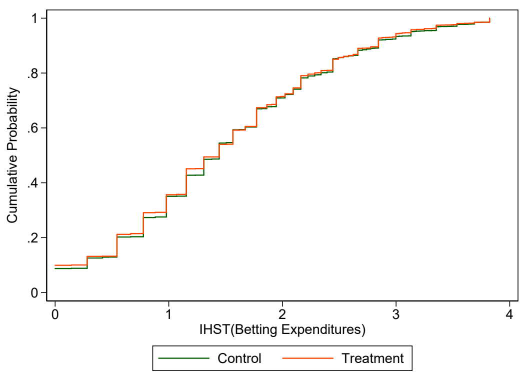
(c) All - Other Expenditures



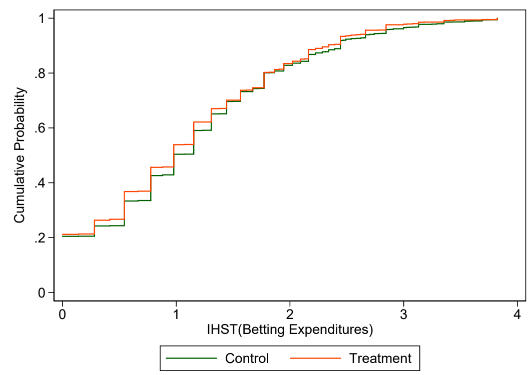
(d) Split - Other Expenditures

Notes: Each panel shows the coefficient estimates from a regression of expenditure thresholds on winnings using the parametric betting profile controls. The outcome variable is making a large expenditure above a threshold (indicated on the x-axis) in that time period. The magnitude of the estimate on winnings is captured on the y-axis. I include time, survey round, and individual fixed effects in all regressions. Standard errors are clustered at the individual level. Panels (a) and (c) are the estimates for all respondents together with the 90% confidence interval dotted around the estimates. Panels (b) and (d) split the sample by people with relatively low and high ability to save. Low saving ability is in blue in both sub-figures with 90% confidence intervals shown by the dotted lines for people with low saving ability. Point estimates for high ability savers are in red. Panels A and B show results for the effect of winnings on peoples' likelihood of biggest expenditures being above different thresholds in that time period whereas Panels C and D look at effects of winnings on all other expenditures.

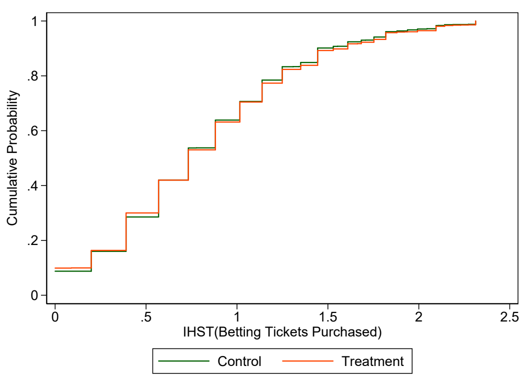
Figure A.5: CDFs by Saving Box Treatment Group - Pre/Post Treatment



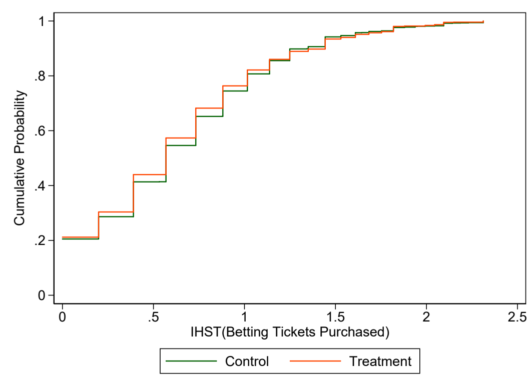
(a) Pre-Treatment - Expenditures



(b) Post-Treatment - Expenditures

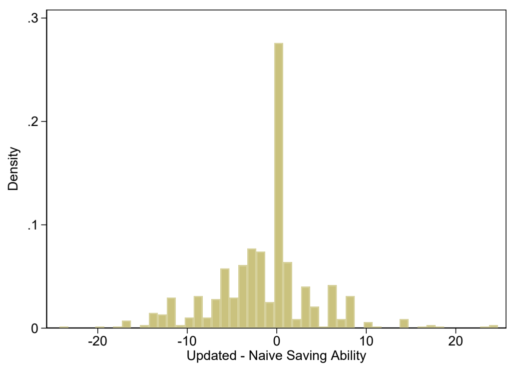


(c) Pre-Treatment - Tickets

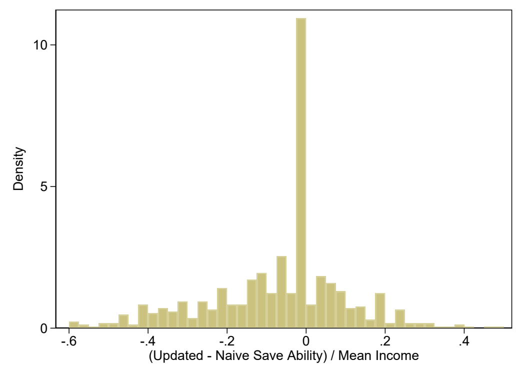


(d) Post-Treatment - Tickets

Figure A.6: Budgeting Exercise Saving Updates



(a) Raw Saving Update



(b) Saving Update / Mean Income

Notes: This figure shows the update size in perceived saving ability resulting from the budgeting exercise. This is calculated as the amount participants felt they could save in a typical week after the budgeting exercise, minus the amount they estimated naively at the beginning of the survey. Panel (a) is the raw update size in thousands of Ugandan Shillings (3,500UGX $\approx$ 1 USD). Panel (b) converts this update size relative to mean income.

Table A.1: Validation of Revealed Preference Measure of Betting Demand

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean Weekly Bet	0.010	0.008						
	(0.004)	(0.004)						
Log(Mean Bet)			0.035	0.026				
			(0.013)	(0.014)				
Mean Bet / Mean Income					0.079	0.180		
					(0.105)	(0.110)		
Betting Exp Last Week							0.005	0.004
							(0.003)	(0.003)
Log(Mean Inc)		0.051		0.051		0.074		0.059
		(0.022)		(0.022)		(0.022)		(0.022)
Mean Dep Var	0.4501	0.4501	0.4501	0.4501	0.4501	0.4501	0.4504	0.4504
Week FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num Obs	2006	2006	2006	2006	2006	2006	2005	2005
R2	0.0329	0.0358	0.0328	0.0356	0.0292	0.0351	0.0308	0.0348
Adj R2	0.0207	0.0231	0.0206	0.0230	0.0170	0.0224	0.0186	0.0221

Notes: This table examines the relationship between peoples' reported levels of betting and their revealed preference measure of betting demand solicited during the betting ticket offer. Regardless of functional form and whether or not income is included as an additional covariate, people who report to bet more also requested more betting tickets.

Trimmed top and bottom 1% of mean income. Mean Bet Exps = Mean weekly betting expenditures during study or "typical" weekly betting expenditures. for respondents in condensed study.

Table A.2: Listing Results

	Wave 1	Wave 2	Overall
Respondents	2,587	2,935	5,522
Ever Bet	59.3%	60.5%	59.9%
Bet Regularly	33.0%	31.1%	32.0%
Weekly Income (USD) - Mean	21.81	21.12	21.44
Weekly Income (USD) - Median	17.14	17.14	17.14
Weekly Bet Expenditures (USD) - Mean	4.09	4.47	4.28
Weekly Bet Expenditures (USD) - Median	2.00	2.86	2.86
Portion of Income Spent on Betting - Mean	25.5%	23.2%	24.4%
Portion of Income Spent on Betting - Median	14.0%	15.0%	14.3%

Table A.3: Summary Statistics: Background and Household

	Full Study (N=957)				Condensed Study, (N=751)			
Panel (a)	Mean	p25	p50	p75	Mean	p25	p50	p75
Weekly Income (Mean)	28.63	17.30	24.46	35.09	36.72	22.86	34.29	45.71
Betting Expenditures	3.02	1.13	2.02	3.65	3.98	1.43	2.86	5.71
% of Income Spent on Betting	12.18	4.57	8.64	15.16	12.42	4.67	8.33	15.00
Live Alone	0.27	-	-	-	0.35	-	-	-
Household Size (> 1)	3.86	3	4	5	3.90	3	4	5
% Contribution of HH Finances	80.19	75	100	100	56.58	25	50	100
Weekly HH Income Per Capita	16.90	6.83	12.26	21.78	26.95	13.71	22.86	35.71
Age	27.16	23	27	30	26.60	22	25	30
Primary	0.83	-	-	-	0.84	-	-	-
Junior Secondary (O-Level)	0.46	-	-	-	0.45	-	-	-
Senior Secondary (A-Level)	0.17	-	-	-	0.19	-	-	-
Panel (b)	Mean	p25	p50	p75	Mean	p25	p50	p75
Available Liquidity	97.48	14.29	28.57	85.71	96.42	8.57	17.14	57.14
Available Liquidity / Mean Income	3.36	0.51	1.34	3.66	2.22	0.29	0.60	1.54
Saving Potential	10.16	4.00	8.57	14.29	8.59	2.86	6.00	11.43
Saving Potential / Mean Income	0.42	0.14	0.30	0.58	0.26	0.10	0.22	0.35
Win Target	360.74	22.86	57.14	171.43	361.26	28.57	57.14	200.00
Win Target / Mean Income	20.56	0.82	2.24	7.43	11.79	0.69	1.88	5.56
Win Target / Liquidity Available	25.58	0.50	1.80	6.67	42.07	1.00	3.00	10.00

Notes: HH income only calculated for 97% in full and 92% in condensed study who contributed to household expenses.

Table A.4: Summary Statistics - Financial Constraints

	Full	Condensed
Feel pressure to spend any extra money	27.0%	34.1%
Concerned family members may use money stored at home	23.7%	NA
Concerned thieves may take money from home	48.6%	58.6%
Have had money stolen from home	29.7%	NA
Have a bank account	41.5%	40.7%
Enrolled in mobile money	90.9%	88.8%
Could get a loan from a bank	46.2%	49.5%
Currently in debt	42.6%	23.0%
Median Outstanding Debt / Mean Income	1.4	1.4
Mean Outstanding Debt / Mean Income	3.9	3.7

Notes: "NA" indicates questions that were not included in the mini study survey. "Full" indicates responses of the 1,003 participants in the full study while "Condensed" indicates resonses from the 839 participants in the single-visit study.

Table A.5: Analysis Samples

Analysis	Sample and Reason
4.1. Winnings and Targets	Sample: In-person visits of full study participants. Reason: Panel betting and consumption data were not part of the condensed study. In-person visits were prioritized because phone check-ins did not collect data on betting targets needed for calculating the betting profiles and full expenditure data was also not captured.
4.2. Savings Boxes	Sample: Full study participants. Reported betting outcomes use both waves and both in-person and phone-checks. Elicited measures only use wave 2 participants at baseline and endline. Reason: Reported outcomes use the maximal sample possible. Elicited outcomes use wave 2 because wave 1 participants did not have a baseline elicited betting demand measure. Wave 1 participants are used in cross-sectional analyses as a robustness check.
4.3 Lumpy Good Prime	Sample: Wave 1 endline observations, Wave 2 baseline and endline observations, and Condensed study participants (excluding budgeting exercise participants). Reason: All possible observations where the lumpy priming experiment was conducted are included with the exception of those who also received the budgeting exercise prime before eliciting betting demand. This is to avoid confounding heterogeneous responses of the lumpy prime with effects of the budgeting exercise that was nested in the prime.
4.4 Budgeting Exercise	Sample: Condensed study participants Reason: The budgeting exercise was not conducted with participants in the full study.

Table A.6: Top Reported Payout Targets and Desired Expenditures

	(1) Prop	(2) IHST	(3) Prop	(4) IHST	(5) Prop	(6) IHST
Expenditure Target Price (ETP)	0.1865	0.1036	-0.0156	0.0163	-0.0473	0.0125
	(0.0771)	(0.0242)	(0.0656)	(0.0250)	(0.0886)	(0.0361)
ETP x Low Save Ability					0.0814	0.0035
					(0.1316)	(0.0496)
Log(Mean Inc)	-12.8756	0.0726				
	(1.3985)	(0.0572)				
Mean Y	17.062	4.813	17.062	4.813	17.062	4.813
P-Val: $\beta_1 + \beta_2 = 0$	.	.	.	.	0.726	0.638
Individual FEs	No	No	Yes	Yes	Yes	Yes
Num Obs	3591	3591	3591	3591	3591	3591
R2	0.2067	0.7392	0.6056	0.8663	0.6117	0.8680

Notes: Columns (1) and (2) are results from regression of $TopPayoutTarget_{i,t} = \beta_0 + \beta_1 TargetExpPrice_{i,t-1} + NoExpTarget_{i,t-1} + \lambda X_{i,t} + \delta_t + \epsilon_{i,t}$. Dependent variable is the reported top amount targeted in betting tickets purchased the preceding week. Expenditure target price was the anticipated lumpy expenditure mentioned during the previous interview. Weekly income and a dummy for no current purchasing target are also included as controls. Columns (3) and (4) replace individual time-invariant covariates with individual fixed effects. Columns (1) and (3) with heading "prop", scale expenditure target and payout target by individual's mean income. Columns (2) and (4) apply the IHST conversion to these two raw variables. Standard errors are clustered at the individual level.

Table A.7: Coefficients from Regression of Winning Residuals on Observable Characteristics

	(1) No Control		(2) Minimal		(3) Non-Parametric		(4) Parametric	
	Beta	P-Val	Beta	P-Val	Beta	P-Val	Beta	P-Val
Saving Potential	0.161	0.104	0.127	0.185	0.081	0.376	0.020	0.827
	(0.099)		(0.096)		(0.092)		(0.093)	
Available Liquidity	0.600	0.170	0.786	0.060	0.505	0.217	0.217	0.573
	(0.437)		(0.418)		(0.409)		(0.384)	
Age	0.251	0.061	0.279	0.033	0.250	0.051	0.236	0.070
	(0.134)		(0.131)		(0.128)		(0.130)	
Live Alone	1.496	0.387	1.854	0.265	1.510	0.349	1.572	0.314
	(1.728)		(1.664)		(1.612)		(1.561)	
Household Size	-0.426	0.238	-0.592	0.094	-0.593	0.084	-0.615	0.071
	(0.361)		(0.353)		(0.343)		(0.341)	
Math Score	0.452	0.201	0.438	0.205	0.253	0.452	0.476	0.176
	(0.354)		(0.346)		(0.336)		(0.351)	
Primary	0.768	0.684	2.088	0.261	1.520	0.414	1.308	0.479
	(1.888)		(1.856)		(1.859)		(1.848)	
O-Level	2.022	0.162	3.16	0.025	2.235	0.103	2.506	0.066
	(1.447)		(1.406)		(1.371)		(1.363)	
A-Level	0.558	0.765	1.321	0.465	0.713	0.690	0.700	0.687
	(1.869)		(1.810)		(1.786)		(1.737)	
Risk Aversion	-0.500	0.194	-0.185	0.623	-0.034	0.927	-0.013	0.972
	(0.385)		(0.377)		(0.373)		(0.373)	
Beta Discounting	-6.162	0.007	-4.404	0.047	-4.839	0.025	-3.402	0.112
	(2.278)		(2.220)		(2.154)		(2.139)	
Delta Discounting	-7.694	0.003	-5.535	0.027	-5.545	0.021	-4.170	0.082
	(2.581)		(2.508)		(2.400)		(2.400)	
Upside Seeker Low	-0.576	0.757	-0.374	0.835	0.408	0.819	0.505	0.776
	(1.859)		(1.796)		(1.785)		(1.776)	
Upside Seeker Mid	-2.139	0.181	-1.950	0.208	-1.112	0.469	-1.218	0.425
	(1.597)		(1.547)		(1.534)		(1.526)	
Upside Seeker High	-1.138	0.459	-1.227	0.411	-0.242	0.870	-0.719	0.626
	(1.535)		(1.491)		(1.477)		(1.473)	

Notes: This table shows "balance" of individual characteristics and winning residuals after residualizing winnings with different types of controls and betting profiles. Winnings are scaled by respondents' mean income. No Control only removes variation explained by the survey round and week. Minimal also removes variation from weekly income, betting expenditures, number of tickets, and tickets squared. Non-Parametric also removes variation from the 126, non-parametric betting profiles explained in Section 4.1. Parmetric instead uses the parameterized betting moments. Win amount / mean income is winsorized at the top 5% and multiplied by 100 for readability.

Table A.8: Winnings and Expenditures - No Betting Profile Controls

Panel (a):	**Expenditures**				**Other Flows**		**Biggest Exp Size**	
	(1) Total Exps	(2) Biggest Exp	(3) Other Exps	(4) Share	(5) Net Saving	(6) Net Transfer	(7) 0.5 x Mean Inc	(8) Mean Inc
Winnings	0.144	0.062	0.082	0.006	0.114	0.016	0.044	0.035
	(0.050)	(0.025)	(0.033)	(0.005)	(0.043)	(0.010)	(0.015)	(0.017)
Mean Y	2.458	0.773	1.685	0.298	0.399	0.008	0.575	0.256
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.634	0.501	0.645	0.385	0.378	0.354	0.447	0.449

Panel (b):	**Expenditures**				**Other Flows**		**Biggest Exp Size**	
	(1) Total Exps	(2) Biggest Exp	(3) Other Exps	(4) Share	(5) Net Saving	(6) Net Transfer	(7) 0.5 x Mean Inc	(8) Mean Inc
Winnings	0.117	0.037	0.080	-0.005	0.085	0.026	0.024	0.012
	(0.075)	(0.039)	(0.047)	(0.008)	(0.067)	(0.014)	(0.020)	(0.025)
Winnings x LSA	0.062	0.058	0.004	0.025	0.067	-0.023	0.048	0.058
	(0.099)	(0.048)	(0.065)	(0.010)	(0.082)	(0.022)	(0.031)	(0.034)
Mean Y	2.458	0.773	1.685	0.298	0.399	0.008	0.575	0.256
P-Val: $\beta_1 + \beta_2 = 0$	0.006	0.001	0.065	0.001	0.001	0.861	0.002	0.003
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.636	0.504	0.647	0.389	0.385	0.361	0.451	0.454

Notes: Columns (1), (2), (3), (5), and (6) scale dependent variable by mean income. Biggest exp is the biggest reported lumpy expenditure where the good or service purchased was indivisible and required payment in full at the time of purchase. Columns (7) and (8) are binary indicators for whether the biggest expenditure in that week was above 0.5 or 1 x mean income for that respondent, respectively. Winnings and expenditures are all winsorized at the top 5% (as well as bottom 5% for net transfers and savings) to avoid outsized influence of outliers. LSA= Low saving ability. All regressions control for weekly income and use individual, week, and survey round fixed effects. For results in Panel (b) all covariates and fixed effects are interacted with low saving ability.

Table A.9: Winnings and Expenditures - Non-Parametric Betting Profiles

Panel (a):	**Expenditures** (1) Total Exps	(2) Biggest Exp	(3) Other Exps	(4) Share	**Other Flows** (5) Net Saving	(6) Net Transfer	**Biggest Exp Size** (7) 0.5 x Mean Inc	(8) Mean Inc
Winnings	0.067	0.055	0.012	0.013	0.098	0.016	0.041	0.030
	(0.047)	(0.025)	(0.029)	(0.005)	(0.042)	(0.011)	(0.015)	(0.018)
Mean Y	2.456	0.773	1.684	0.298	0.399	0.008	0.575	0.256
Num Obs	4632	4632	4632	4632	4632	4632	4632	4632
Num Inds	945	945	945	945	945	945	945	945
R2	0.650	0.510	0.667	0.401	0.393	0.364	0.454	0.455

Panel (b):	**Expenditures** (1) Total Exps	(2) Biggest Exp	(3) Other Exps	(4) Share	**Other Flows** (5) Net Saving	(6) Net Transfer	**Biggest Exp Size** (7) 0.5 x Mean Inc	(8) Mean Inc
Winnings	0.021	0.021	-0.000	0.001	0.077	0.022	0.021	0.002
	(0.072)	(0.039)	(0.045)	(0.008)	(0.068)	(0.015)	(0.020)	(0.025)
Winnings x LSA	0.108	0.076	0.032	0.025	0.056	-0.017	0.049	0.068
	(0.096)	(0.048)	(0.062)	(0.010)	(0.084)	(0.022)	(0.031)	(0.034)
Mean Y	2.458	0.773	1.685	0.298	0.399	0.008	0.575	0.256
P-Val: $\beta_1 + \beta_2 = 0$	0.042	0.001	0.466	0.000	0.007	0.798	0.004	0.003
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.647	0.507	0.664	0.397	0.388	0.362	0.452	0.456

Notes: Columns (1), (2), (3), (5), and (6) scale dependent variable by mean income. Biggest exp is the biggest reported lumpy expenditure where the good or service purchased was indivisible and required payment in full at the time of purchase. Columns (7) and (8) are binary indicators for whether the biggest expenditure in that week was above 0.5 or 1 x mean income for that respondent, respectively. Winnings and expenditures are all winsorized at the top 5% (as well as bottom 5% for net transfers and savings) tp avoid outsized influence of outliers. LSA= Low saving ability. All regressions control for betting expenditures, number of tickets, tickets squared, non-parametric betting profiles, and weekly income and use individual, week, and survey round fixed effects. For results in Panel (b) all covariates and fixed effects are interacted with low saving ability.

Table A.10: Winnings and Expenditures - Raw Data

Panel (a):	**Expenditures**				**Other Flows**		**Biggest Exp Size**	
	(1) Total Exps	(2) Biggest Exp	(3) Other Exps	(4) Share	(5) Net Saving	(6) Net Transfer	(7) 0.5 x Mean Inc	(8) Mean Inc
Winnings	0.216	0.180	0.036	0.014	0.190	0.011	0.033	0.026
	(0.172)	(0.094)	(0.086)	(0.006)	(0.093)	(0.021)	(0.011)	(0.015)
Mean Y	2.712	0.908	1.805	0.300	0.429	-0.038	0.575	0.256
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.524	0.327	0.641	0.393	0.319	0.224	0.451	0.453

Panel (b):	**Expenditures**				**Other Flows**		**Biggest Exp Size**	
	(1) Total Exps	(2) Biggest Exp	(3) Other Exps	(4) Share	(5) Net Saving	(6) Net Transfer	(7) 0.5 x Mean Inc	(8) Mean Inc
Winnings	0.255	0.227	0.028	0.010	0.175	0.004	0.007	-0.002
	(0.301)	(0.161)	(0.150)	(0.010)	(0.140)	(0.025)	(0.013)	(0.023)
Winnings x LSA	-0.070	-0.097	0.027	0.013	-0.023	0.041	0.059	0.075
	(0.307)	(0.166)	(0.157)	(0.011)	(0.152)	(0.081)	(0.023)	(0.030)
Mean Y	2.712	0.908	1.805	0.300	0.429	-0.038	0.575	0.256
P-Val: $\beta_1 + \beta_2 = 0$	0.004	0.003	0.226	0.000	0.011	0.560	0.001	0.000
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.530	0.335	0.646	0.397	0.331	0.244	0.457	0.462

Notes: Columns (1), (2), (3), (5), and (6) scale dependent variable by mean income. Biggest exp is the biggest reported lumpy expenditure where the good or service purchased was indivisible and required payment in full at the time of purchase. Columns (7) and (8) are binary indicators for whether the biggest expenditure in that week was above 0.5 or 1 x mean income for that respondent, respectively. LSA= Low saving ability. All regressions control for betting expenditures, number of tickets, tickets squared, parametric betting profiles, and weekly income and use individual, week, and survey round fixed effects. For results in Panel (b) all covariates and fixed effects are interacted with low saving ability.

Table A.11: Winnings and Expenditures - 1% Winsorization

	Expenditures				Other Flows		Biggest Exp Size	
Panel (a):	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Exps	Biggest Exp	Other Exps	Share	Net Saving	Net Transfer	0.5 x Mean Inc	Mean Inc
Winnings	0.075	0.075	0.001	0.013	0.124	0.011	0.036	0.027
	(0.058)	(0.037)	(0.035)	(0.005)	(0.069)	(0.016)	(0.012)	(0.016)
Mean Y	2.613	0.846	1.767	0.300	0.410	-0.007	0.575	0.256
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.640	0.496	0.661	0.393	0.346	0.255	0.451	0.453

	Expenditures				Other Flows		Biggest Exp Size	
Panel (b):	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Exps	Biggest Exp	Other Exps	Share	Net Saving	Net Transfer	0.5 x Mean Inc	Mean Inc
Winnings	0.008	0.051	-0.044	0.007	0.068	-0.000	0.007	-0.005
	(0.093)	(0.065)	(0.049)	(0.009)	(0.114)	(0.028)	(0.015)	(0.024)
Winnings x LSA	0.155	0.056	0.098	0.016	0.094	0.023	0.059	0.078
	(0.111)	(0.071)	(0.067)	(0.011)	(0.128)	(0.040)	(0.024)	(0.031)
Mean Y	2.613	0.846	1.767	0.300	0.410	-0.007	0.575	0.256
P-Val: $\beta_1 + \beta_2 = 0$	0.007	0.000	0.233	0.000	0.005	0.419	0.001	0.000
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.644	0.501	0.665	0.398	0.358	0.269	0.457	0.462

Notes: Columns (1), (2), (3), (5), and (6) scale dependent variable by mean income. Biggest exp is the biggest reported lumpy expenditure where the good or service purchased was indivisible and required payment in full at the time of purchase. Columns (7) and (8) are binary indicators for whether the biggest expenditure in that week was above 0.5 or 1 x mean income for that respondent, respectively. Winnings and expenditures are all winsorized at the top 1% (as well as bottom 1% for net transfers and savings) to avoid outsized influence of outliers. LSA= Low saving ability. All regressions control for betting expenditures, number of tickets, tickets squared, parametric betting profiles, and weekly income and use individual, week, and survey round fixed effects. For results in Panel (b) all covariates and fixed effects are interacted with low saving ability.

Table A.12: Winnings and Expenditures - 10% Winsorization

Panel (a):	Expenditures				Other Flows		Biggest Exp Size	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Exps	Biggest Exp	Other Exps	Share	Net Saving	Net Transfer	0.5 x Mean Inc	Mean Inc
Winnings	0.012	0.036	-0.024	0.014	0.037	0.013	0.039	0.027
	(0.045)	(0.022)	(0.030)	(0.006)	(0.051)	(0.014)	(0.020)	(0.022)
Mean Y	2.328	0.711	1.617	0.295	0.364	0.002	0.575	0.256
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.659	0.523	0.669	0.402	0.373	0.362	0.450	0.453

Panel (b):	Expenditures				Other Flows		Biggest Exp Size	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Exps	Biggest Exp	Other Exps	Share	Net Saving	Net Transfer	0.5 x Mean Inc	Mean Inc
Winnings	-0.079	-0.014	-0.066	0.000	-0.033	0.030	-0.002	-0.009
	(0.060)	(0.031)	(0.042)	(0.009)	(0.082)	(0.019)	(0.026)	(0.031)
Winnings x LSA	0.190	0.108	0.082	0.032	0.133	-0.037	0.083	0.085
	(0.089)	(0.044)	(0.061)	(0.012)	(0.101)	(0.028)	(0.041)	(0.044)
Mean Y	2.328	0.711	1.617	0.295	0.364	0.002	0.575	0.256
P-Val: $\beta_1 + \beta_2 = 0$	0.094	0.003	0.710	0.000	0.093	0.712	0.011	0.014
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945
R2	0.663	0.528	0.672	0.408	0.384	0.371	0.457	0.461

Notes: Columns (1), (2), (3), (5), and (6) scale dependent variable by mean income. Biggest exp is the biggest reported lumpy expenditure where the good or service purchased was indivisible and required payment in full at the time of purchase. Columns (7) and (8) are binary indicators for whether the biggest expenditure in that week was above 0.5 or 1 x mean income for that respondent, respectively. Winnings and expenditures are all winsorized at the top 10% (as well as bottom 10% for net transfers and savings) to avoid outsized influence of outliers. LSA= Low saving ability. All regressions control for betting expenditures, number of tickets, tickets squared, parametric betting profiles, and weekly income and use individual, week, and survey round fixed effects. For results in Panel (b) all covariates and fixed effects are interacted with low saving ability.

Table A.13: Biggest Expense Value and Winning Amount - Imbalance Dynamic Controls

Panel (a):	(1) Orig	(2) Age	(3) HH Size	(4) O-Level	(5) Delta
Winnings	0.045	0.048	0.046	0.049	0.047
	(0.026)	(0.026)	(0.026)	(0.026)	(0.025)
Mean Y	0.7730	0.7730	0.7730	0.7730	0.7730
Num Obs	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945
R2	0.508	0.512	0.512	0.511	0.512

Panel (b):	(1) Orig	(2) Age	(3) HH Size	(4) Primary	(5) O-Level
Winnings	0.005	0.008	0.005	0.005	0.010
	(0.041)	(0.042)	(0.041)	(0.042)	(0.040)
Winnings x LSA	0.092	0.085	0.094	0.095	0.086
	(0.051)	(0.051)	(0.050)	(0.051)	(0.050)
Mean Y	0.7730	0.7730	0.7730	0.7730	0.7730
P-Val: $\beta_1 + \beta_2 = 0$	0.001	0.002	0.001	0.001	0.001
Num Obs	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945
R2	0.513	0.521	0.519	0.519	0.521

Notes: Column (1), "Orig", reproduces the original main results on Biggest Expenditure from winnings for reference. The headings of columns (2)-(5) indicate a dimension of imbalance identified in Appendix Table A.7. All individuals are then defined as being above/below the median for this variable. Regressions for that column then replace time and survey round fixed effects with time or survey round by high/low imbalance variable fixed effects (doubling the number of fixed effects bins for each of the two fixed effects. This explicitly controls for differential dynamic trends in the data for people with high or low levels of a variable that, in the cross-section is imbalanced. Individual fixed effects remain included in the estimation.

Table A.14: Biggest Expense Share of Total Expenditures and Winning Amount - Imbalance Dynamic Controls

Panel (a):	(1) Orig	(2) Age	(3) HH Size	(4) O-Level	(5) Delta
Winnings	0.013	0.013	0.012	0.013	0.012
	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)
Mean Y	0.2983	0.2983	0.2983	0.2983	0.2983
Num Obs	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945
R2	0.397	0.399	0.400	0.401	0.403

Panel (b):	(1) Orig	(2) Age	(3) HH Size	(4) O-Level	(5) Delta
Winnings	0.003	0.004	0.003	0.002	0.003
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Winnings x LSA	0.023	0.021	0.024	0.026	0.023
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Mean Y	0.2983	0.2983	0.2983	0.2983	0.2983
P-Val: $\beta_1 + \beta_2 = 0$	0.000	0.000	0.000	0.000	0.000
Num Obs	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945
R2	0.403	0.408	0.409	0.414	0.411

Notes: Column (1), “Orig”, reproduces the original main results on Biggest Expenditure share of total expenditures from winnings for reference. The headings of columns (2)-(5) indicate a dimension of imbalance identified in Appendix Table A.7. All individuals are then defined as being above/below the median for this variable. Regressions for that column then replace time and survey round fixed effects with time or survey round by high/low imbalance variable fixed effects (doubling the number of fixed effects bins for each of the two fixed effects. This explicitly controls for differential dynamic trends in the data for people with high or low levels of a variable that, in the cross-section is imbalanced. Individual fixed effects remain included in the estimation.

Table A.15: Biggest Expenditure Greater than Mean Income and Winning Amount - Imbalance Dynamic Controls

Panel (a):	(1) Orig	(2) Age	(3) HH Size	(4) O-Level	(5) Delta
Winnings	0.028	0.029	0.027	0.029	0.029
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Mean Y	0.2561	0.2561	0.2561	0.2561	0.2561
Num Obs	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945
R2	0.453	0.457	0.457	0.456	0.457

Panel (b):	(1) Orig	(2) Age	(3) HH Size	(4) O-Level	(5) Delta
Winnings	-0.003	-0.002	-0.004	0.001	-0.000
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Winnings x LSA	0.073	0.069	0.074	0.070	0.071
	(0.036)	(0.036)	(0.036)	(0.037)	(0.036)
Mean Y	0.2561	0.2561	0.2561	0.2561	0.2561
P-Val: $\beta_1 + \beta_2 = 0$	0.004	0.004	0.003	0.004	0.003
Num Obs	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945
R2	0.461	0.468	0.468	0.468	0.469

Notes: Column (1), "Orig", reproduces the original main results on whether the individual made a lumpy expenditure larger than their mean reported income on winnings for reference. The headings of columns (2)-(6) indicate a dimension of imbalance identified in the winnings balance table for winnings/mean income from the winnings balance table. All individuals are then defined as being above/below the median for this variable. Regressions for that column then replace time and survey round fixed effects with time or survey round by high/low imbalance variable fixed effects (doubling the number of fixed effects bins for each of the two fixed effects. This explicitly controls for differential dynamic trends in the data for people with high or low levels of a variable that, in the cross-section is imbalanced. Individual fixed effects remain included in the estimation.

Table A.16: Winnings and Expenditure Thresholds - Parametric Profile

	Lumpy Expenditure Thresholds				Divisible Expenditure Thresholds				
Panel (a)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	0.5	1	1.5	2	0.5	1	2	3	4
Winnings	0.037	0.028	0.022	0.008	0.003	0.005	-0.002	-0.000	-0.007
	(0.015)	(0.018)	(0.014)	(0.012)	(0.007)	(0.012)	(0.015)	(0.013)	(0.008)
Mean Y	0.575	0.256	0.127	0.076	0.929	0.700	0.302	0.128	0.058
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945	945
R2	0.450	0.453	0.410	0.401	0.504	0.552	0.504	0.494	0.463

	Lumpy Expenditure Thresholds				Divisible Expenditure Thresholds				
Panel (b)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	0.5	1	1.5	2	0.5	1	2	3	4
Winnings	0.007	-0.003	0.010	0.004	0.005	-0.010	-0.028	-0.007	-0.004
	(0.018)	(0.027)	(0.023)	(0.021)	(0.009)	(0.017)	(0.020)	(0.021)	(0.015)
Winnings x LSA	0.063	0.073	0.027	0.008	-0.011	0.027	0.049	0.014	-0.010
	(0.031)	(0.036)	(0.029)	(0.024)	(0.013)	(0.025)	(0.031)	(0.026)	(0.016)
Mean Y	0.575	0.256	0.127	0.076	0.929	0.700	0.302	0.128	0.058
P-Val: $\beta_1 + \beta_2 = 0$	0.005	0.004	0.046	0.293	0.548	0.356	0.367	0.691	0.008
Num Obs	4635	4635	4635	4635	4635	4635	4635	4635	4635
Num Inds	945	945	945	945	945	945	945	945	945
R2	0.457	0.461	0.416	0.408	0.512	0.556	0.508	0.498	0.470

Notes: Outcome variables for each regression are binary indicators for expenditure levels in a given week above a given threshold. Expenditure thresholds for columns (1) - (4) reflect the value of an individual's biggest lumpy expenditure. Columns (5) - (10) are other expenditures reported in that week. Thresholds are shown at the top of each column relative to individuals' mean income. LSA=Low saving ability. All regressions include individual, survey round, and week fixed effects as well as weekly income. Standard errors are clustered at the individual level. Fixed effects and covariates in Panel (b) are all interacted with low saving ability.

Table A.17: Tests of Thresholds across Expenditure Type and Thresholds - Scaled Coefficients

Panel (a): Divisible Expenditures

Sample		Threshold: 0.5	1	1.5	2	3	4
Full:	Winnings	0.004	0.008	-0.027	-0.007	-0.004	-0.114
		(0.008)	(0.018)	(0.035)	(0.049)	(0.103)	(0.143)
LSA:	Winnings	-0.006	0.024	0.038	0.069	0.052	-0.227
		(0.010)	(0.026)	(0.062)	(0.076)	(0.131)	(0.086)
HSA:	Winnings	0.006	-0.014	-0.078	-0.092	-0.054	-0.064
		(0.010)	(0.024)	(0.038)	(0.067)	(0.162)	(0.257)

Panel (b): Full Sample - Big Expenditures and Test of Differences with Divisible Expenditures

	Threshold: 0.5	1	1.5	2
Winnings	0.065	0.108	0.177	0.103
	(0.026)	(0.072)	(0.114)	(0.161)
P-Val 1:1	0.020	0.139	0.069	0.490
P-Val 1:2	0.030	0.130	0.118	0.187

Panel (c): Split Sample - Big Expenditures and Test of Differences with Divisible Expenditures

LSA Sample:

	Threshold: 0.5	1	1.5	2
Winnings	0.126	0.305	0.340	0.193
	(0.044)	(0.105)	(0.170)	(0.183)
P-Val 1:1	0.002	0.004	0.076	0.518
P-Val 1:2	0.010	0.036	0.047	0.018

HSA Sample:

	Threshold: 0.5	1	1.5	2
Winnings	0.011	-0.012	0.068	0.046
	(0.031)	(0.096)	(0.156)	(0.235)
P-Val 1:1	0.874	0.977	0.323	0.541
P-Val 1:2	0.473	0.435	0.487	0.672

Panel (d): Big Expenditure Different Threshold Tests within Group

		Threshold 2: Full Sample			LSA Sample			HSA Sample		
		1	1.5	2	1	1.5	2	1	1.5	2
	0.5	0.416	0.240	0.785	0.025	0.134	0.699	0.743	0.652	0.858
Threshold 1:	1	.	0.329	0.970	.	0.761	0.484	.	0.367	0.724
	1.5	.	.	0.434	.	.	0.323	.	.	0.853

Notes: Panel (a) shows regression results estimating the effect of winnings (scaled by mean income) on making total non-lumpy expenditures above a given threshold size (again, relative to mean income *and* average incidence of this outcome). The first row uses the full sample while the second and third are estimated using only the low saving ability (LSA) and high saving ability (HSA) samples, respectively. Panel (b) shows regression results of big purchase (biggest lumpy expenditure) thresholds on winnings. The p-values at the bottom are from a seemingly unrelated estimation, "suest", test of coefficients comparing the results in Panel (b) to those in the first row of Panel (a). P-val 1:1 indicates that the coffecient in that column is being compared to the same threshold from Panel (a) (for the corresponding row). P-val 1:2 compares this coefficient to the coefficient in Panel (a) that is twice as large (and has similar average incidence in the data). Panel (c) is structured similarly to Panel (b) with P-value comparisons made with respect to their own sample in Panel (a). Panel (d) tests for differences of estimation results within a given sample but across different threshold levels. The first threshold, "threshold 1" is listed on the left and the column headers indicate "threshold 2" in this suest test for the indicated samples.

Table A.18: Tests of Thresholds across Expenditure Type and Thresholds - Unadjusted Coefficients

Panel (a): Divisible Expenditures

Sample		Threshold: 0.5	1	1.5	2	3	4
Full:	Winnings	0.003	0.005	-0.014	-0.003	-0.001	-0.007
		(0.007)	(0.012)	(0.016)	(0.015)	(0.013)	(0.008)
LSA:	Winnings	-0.005	0.017	0.018	0.021	0.007	-0.013
		(0.009)	(0.018)	(0.029)	(0.023)	(0.017)	(0.005)
HSA:	Winnings	0.005	-0.010	-0.037	-0.028	-0.007	-0.004
		(0.009)	(0.017)	(0.018)	(0.020)	(0.021)	(0.015)

Panel (b): Full Sample - Big Expenditures and Test of Differences with Divisible Expenditures

	Threshold: 0.5	1	1.5	2
Winnings	0.037	0.028	0.022	0.008
	(0.015)	(0.018)	(0.014)	(0.012)
P-Val 1:1	0.032	0.227	0.073	0.567
P-Val 1:2	0.047	0.146	0.119	0.209

Panel (c): Split Sample - Big Expenditures and Test of Differences with Divisible Expenditures

	LSA Sample				HSA Sample			
	Threshold: 0.5	1	1.5	2	Threshold: 0.5	1	1.5	2
Winnings	0.069	0.070	0.037	0.012	0.007	-0.003	0.010	0.004
	(0.024)	(0.024)	(0.018)	(0.011)	(0.018)	(0.027)	(0.023)	(0.021)
P-Val 1:1	0.001	0.028	0.550	0.728	0.955	0.801	0.054	0.203
P-Val 1:2	0.020	0.087	0.068	0.022	0.460	0.409	0.484	0.689

Panel (d): Big Expenditure Different Threshold Tests within Group - P-Values

		Threshold 2: Full Sample			LSA Sample			HSA Sample		
		1	1.5	2	1	1.5	2	1	1.5	2
	0.5	0.519	0.348	0.067	0.966	0.154	0.015	0.636	0.875	0.908
Threshold 1:	1	.	0.636	0.132	.	0.035	0.003	.	0.351	0.662
	1.5	.	.	0.082	.	.	0.063	.	.	0.601

Notes: Panel (a) shows regression results estimating the effect of winnings (scaled by mean income) on making total non-lumpy expenditures above a given threshold size (again, relative to mean income). The first row uses the full sample while the second and third are estimated using only the low saving ability (LSA) and high saving ability (HSA) samples, respectively. Panel (b) shows regression results of big purchase (biggest lumpy expenditure) thresholds on winnings. The p-values at the bottom are from a seemingly unrelated estimation, "suest", test of coefficients comparing the results in Panel (b) to those in the first row of Panel (a). P-val 1:1 indicates that the coffecient in that column is being compared to the same threshold from Panel (a) (for the corresponding row). P-val 1:2 compares this coefficient to the coefficient in Panel (a) that is twice as large (and has similar average incidence in the data). Panel (c) is structured similarly to Panel (b) with P-value comparisons made with respect to their own sample in Panel (a). Panel (d) tests for differences of estimation results within a given sample but across different threshold levels. The first threshold, "threshold 1" is listed on the left and the column headers indicate "threshold 2" in this suest test for the indicated samples.

Table A.19: Treatment Assignment Balance

	Saving Box						**Lumpy Good Prime**			**Budgeting Exercise**		
	Panel (a) Wave 1: N=453			Panel (b) Wave 2: N=504			Panel (c) N=1801			Panel (d) N=686		
	Control	Treat	P-Val	Control	Treat	P-Val	Control	Treat	P-Val	Control	Treat	P-Val
Mean Weekly Income (USD)	29.154	28.180	0.65	28.426	28.317	0.94	31.088	31.097	0.99	36.376	36.971	0.70
Bet Expenditures / Mean Inc	0.165	0.145	0.40	0.148	0.160	0.48	0.120	0.120	0.95	0.126	0.126	0.98
Save Potential (USD)	12.201	12.148	0.96	7.091	6.960	0.80	8.957	8.753	0.69	8.866	7.756	0.11
Save Potential / Mean Inc	0.503	0.514	0.79	0.334	0.324	0.75	0.337	0.324	0.41	0.259	0.227	0.03
Liquidity Available / Mean Inc	3.853	3.354	0.46	2.915	2.839	0.84	2.663	2.669	0.98	1.617	1.356	0.23
Saving Ability Index	0.016	-0.049	0.55	0.009	-0.009	0.84	0.024	-0.007	0.51	0.040	-0.097	0.11
Lumpy Good Purchased	.	.	.	.	.	.	0.109	0.098	0.46	.	.	.
Cost of Lumpy Good / Mean Inc	.	.	.	.	.	.	10.594	10.694	0.94	4.427	5.448	0.41
Live Alone	0.264	0.259	0.92	0.247	0.269	0.58	0.286	0.281	0.81	0.356	0.356	1.00
Household Size	2.982	3.250	0.21	3.251	3.004	0.17	3.091	3.043	0.62	2.927	2.655	0.11
Completed Primary	0.821	0.839	0.66	0.841	0.842	0.97	0.831	0.842	0.54	0.841	0.840	0.97
Completed O-Level	0.422	0.473	0.35	0.478	0.482	0.93	0.459	0.471	0.63	0.457	0.479	0.60
Completed A-Level	0.158	0.134	0.53	0.191	0.198	0.86	0.194	0.192	0.92	0.207	0.170	0.27
Math Score	7.880	7.911	0.89	8.347	8.059	0.06	6.768	6.719	0.70	3.502	3.526	0.82
Beta Discounting	0.486	0.467	0.57	0.503	0.472	0.28	0.463	0.459	0.76	0.396	0.401	0.87
Delta Discounting	0.639	0.624	0.65	0.609	0.565	0.11	0.582	0.575	0.64	0.543	0.550	0.81
Risk Aversion. 0=Low 6=High	2.073	2.250	0.39	2.175	2.134	0.79	2.329	2.271	0.53	2.679	2.753	0.70
Upside Seeker - Low	0.164	0.152	0.76	0.171	0.174	0.94	0.056	0.064	0.43	0.069	0.062	0.73
Upside Seeker - Mid	0.220	0.161	0.18	0.243	0.225	0.64	0.070	0.072	0.83	0.077	0.108	0.19
Upside Seeker - High	0.261	0.205	0.24	0.271	0.233	0.33	0.076	0.084	0.56	0.081	0.088	0.79
Endline Lumpy Prime	0.235	0.268	0.48	0.446	0.530	0.06	.	.	.	.	.	.
Treatment - Saving Box	0.000	1.000	0.00	0.000	1.000	0.00	0.172	0.186	0.46	.	.	.
Treatment - Wallet	0.490	0.536	0.40	0.315	0.308	0.88	0.168	0.144	0.16	.	.	.
Treatment - Bet Info	0.493	0.500	0.89	0.307	0.308	0.97	0.145	0.162	0.32	.	.	.
N	341	112		251	253		917	884		492	194	

Notes: Values marked as “NA” were either not collected for that round or, in the case of the saving box treatment in Panels (a) and (b) was a potential outcome of the treatment. Saving update was only included as part of the budgeting exercise. No alternative treatments are relevant to the budgeting exercise because these participants were exclusively in the condensed study so that they had not been eligible for treatments. Participants in Wave 2 participated in the lumpy prime experiment twice, in the first and final round of the study. Each was given the lumpy prime once and kept as a control once and thus are included in both groups.

Table A.20: Saving Box Takeup

	(1) All	(2) Low Save Ability	(3) High Save Ability	(4) No Box	(5) Box
Savings Box	0.5324	0.5293	0.5361	0.5045	0.5569
	(0.0286)	(0.0403)	(0.0406)	(0.0353)	(0.0475)
Constant	0.1572	0.1463	0.1678	0.1057	0.2791
	(0.0151)	(0.0209)	(0.0219)	(0.0153)	(0.0343)
Mean Dep Var	0.3627	0.3538	0.3715	0.2908	0.5167
Mean Control	0.1572	0.1463	0.1678	0.1057	0.2791
Num Obs	943	472	471	643	300
Adj R2	0.2899	0.2906	0.2885	0.2856	0.3014

Notes: This is the effect of being assigned to the saving box treatment group on having used a saving box within a month of the endline. Columns (2) and (3) split the sample by low and high ability savers as defined by the saving ability index. Culumns (4) and (5) split the sample by people who, at baseline, reported not to have or to have either a lock box or piggy bank.

Table A.21: Effect of Saving Box on Savings Outcomes

Panel (a):	**On-Hand Liquidity**		**Accumulated Savings (AS)**		**Net Savings (NS)**		**Expenditures**	
	(1) 10K UGX	(2) 50K UGX	(3) 1K UGX	(4) IHST(AS)	(5) 1K UGX	(6) IHST(NS)	(7) IHST(Big Exp)	(8) IHST(Other)
Savings Box	-0.0438	0.0171	-9.9840	0.0226	1.2675	0.4450	0.0919	-0.0821
	(0.0469)	(0.0413)	(14.4917)	(0.1215)	(1.7256)	(0.5627)	(0.1150)	(0.0470)
Mean Dep Var	0.7280	0.1680	75.5974	12.2389	12.6492	5.7285	11.2850	12.3725
Num Obs	1000	1000	1000	1000	4719	4719	4712	4719
Num Indivs	500	500	500	500	957	957	957	957
Adj R2	0.3130	0.2300	0.3249	0.4918	0.3018	0.1796	0.2110	0.4241

Panel (b):	**On-Hand Liquidity**		**Accumulated Savings (AS)**		**Net Savings (NS)**		**Expenditures**	
	(1) 10K UGX	(2) 50K UGX	(3) 1K UGX	(4) IHST(AS)	(5) 1K UGX	(6) IHST(NS)	(7) IHST(Big Exp)	(8) IHST(Other)
Savings Box	0.0317	0.0324	-3.6017	-0.1546	-0.0334	-0.0327	0.3158	-0.0601
	(0.0690)	(0.0611)	(25.4029)	(0.1809)	(2.4699)	(0.7948)	(0.1924)	(0.0528)
Save Box x LSA	-0.1473	-0.0250	-16.6933	0.3454	2.5429	0.8806	-0.4155	-0.0504
	(0.0932)	(0.0831)	(28.4875)	(0.2405)	(3.4451)	(1.1210)	(0.2338)	(0.0879)
Mean Dep Var	0.7280	0.1680	75.5974	12.2389	12.6492	5.7285	11.2850	12.3725
P-Val: $\beta_1 + \beta_2 = 0$	0.0650	0.8960	0.1160	0.2290	0.2960	0.2840	0.4530	0.1160
Num Obs	1000	1000	1000	1000	4719	4719	4712	4719
Num Indivs	500	500	500	500	957	957	957	957
Adj R2	0.3094	0.2222	0.3561	0.5123	0.3024	0.1773	0.2108	0.4286

Panel (c):	**On-Hand Liquidity**		**Accumulated Savings (AS)**		**Net Savings (NS)**		**Expenditures**	
	(1) 10K UGX	(2) 50K UGX	(3) 1K UGX	(4) IHST(AS)	(5) 1K UGX	(6) IHST(NS)	(7) IHST(Big Exp)	(8) IHST(Other)
Savings Box	0.0515	0.1008	6.1735	-0.0243	-0.2574	0.1301	0.1823	-0.0684
	(0.0739)	(0.0658)	(24.0296)	(0.1987)	(2.6643)	(1.0122)	(0.2417)	(0.0614)
Saving Box x No Box	-0.1427	-0.1244	-22.4047	0.0896	2.5218	0.5190	-0.1268	-0.0184
	(0.0957)	(0.0839)	(30.0317)	(0.2517)	(3.4697)	(1.2158)	(0.2712)	(0.0864)
Mean Dep Var	0.7280	0.1680	75.5974	12.2389	12.6492	5.7285	11.2850	12.3725
P-Val: $\beta_1 + \beta_2 = 0$	0.1350	0.6500	0.3680	0.6720	0.3090	0.3350	0.6520	0.1540
Num Obs	1000	1000	1000	1000	4719	4719	4712	4719
Num Indivs	500	500	500	500	957	957	957	957
Adj R2	0.3089	0.2265	0.3405	0.4907	0.3048	0.1822	0.2082	0.4241

Note: Effect of saving box estimated with difference in differences specification. LSA=low ability savers who have saving ability index scores below the median. No Box=respondents at baseline who did not have either a lockbox or piggy bank. Saving index, in column (9), is a standardized index of the sum of standardized accumulated and standardized net savings. On-hand liquidity was asked as to whether the respondent was carrying either 10 or 50 thousand Ugandan Shillings with them at the time of interview. Questions about on-hand liquidity and accumulated savings were only asked at baseline in wave 1, whereas they were also asked at endline for wave 2. Therefore, only wave 2 respondents are eincluded in columns (1)-(5).

Table A.22: Savings Box Treatment: Wave 1 Cross-section

Panel (a):	**Reported** (1) Number	(2) USD	**Elicited** (3) Max (0/1)	(4) Number (0-4)	(5) Index
Savings Box	-0.0487	-0.0296	-0.0855	-0.2210	-0.1663
	(0.4231)	(0.3068)	(0.0561)	(0.1583)	(0.1116)
Mean Dep Var	4.4061	2.4076	0.4334	2.7201	0.0000
Num Obs	1698	1698	443	443	443
Adj R2	0.0346	0.0296	0.0237	0.0421	0.0665

Panel (b):	**Reported** (1) Number	(2) USD	**Elicited** (3) Max (0/1)	(4) Number (0-4)	(5) Index
Savings Box	-0.2083	-0.4469	-0.1393	-0.2594	-0.2743
	(0.5406)	(0.3853)	(0.0827)	(0.2268)	(0.1478)
Save Box x LSA	0.2843	0.8123	0.0930	0.0554	0.2036
	(0.8522)	(0.6173)	(0.1134)	(0.3225)	(0.2262)
Mean Dep Var	4.4061	2.4076	0.4334	2.7201	0.0000
P-Val: $\beta_1 + \beta_2 = 0$	0.9083	0.4491	0.5505	0.3743	0.6798
Num Obs	1698	1698	443	443	443
Adj R2	0.0374	0.0306	0.0210	0.0275	0.0584

Panel (c):	**Reported** (1) Number	(2) USD	**Elicited** (3) Max (0/1)	(4) Number (0-4)	(5) Index
Savings Box	-0.1903	0.0561	-0.0177	0.2587	0.0705
	(0.7576)	(0.4992)	(0.1194)	(0.2992)	(0.2037)
Save Box x No Box	0.1327	-0.1518	-0.0889	-0.6373	-0.3054
	(0.9145)	(0.6258)	(0.1358)	(0.3535)	(0.2434)
Mean Dep Var	4.4061	2.4076	0.4334	2.7201	0.0000
P-Val: $\beta_1 + \beta_2 = 0$	0.9106	0.8000	0.1003	0.0448	0.0788
Num Obs	1698	1698	443	443	443
Adj R2	0.0358	0.0277	0.0125	0.0408	0.0738

Notes: Reported measures of betting from survey responses. Elicited measures are from the incentivized betting ticket offer. Index is the standardized sum of the standardized measures. All panels control income and other treatments as well as week and survey round fixed effects. Panel (b) assesses heterogeneity by low saving ability as indicated by being below the median on the saving ability index. Panel (c) analyzes heterogeneity by having neither a lockbox or piggy bank at baseline. Panels (b) and (c) interact all controls and fixed effects by that dimension of heterogeneity.

Table A.23: Savings Box Treatment Robustness to Lumpy Prime Interaction: Diff-Diff / X-Section

	Diff-Diff: Wave 2			**X-Section: Wave 1**		
	(1) Max (0/1)	(2) Total (0-4)	(3) Index	(4) Max (0/1)	(5) Total (0-4)	(6) Index
Savings Box	-0.1214	-0.3153	-0.1998	-0.1195	-0.3400	-0.2671
	(0.0777)	(0.2456)	(0.1204)	(0.0628)	(0.1795)	(0.1148)
Savings Box x Lumpy Prime	-0.0363	0.0023	0.0465	0.1312	0.4590	0.3889
	(0.1108)	(0.3506)	(0.1769)	(0.1234)	(0.3365)	(0.2638)
Lumpy Prime				0.1054	0.0804	0.0944
				(0.0724)	(0.2019)	(0.1416)
Mean Dep Var	0.4655	2.5304	-0.0026	0.4334	2.7201	0.0000
Num Obs	986	986	986	443	443	443
Other Treats	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.2548	0.2804	0.5290	0.0240	0.0440	0.0699

Notes: This table shows robustness of the saving box treatment to an interaction with the lumpy good prime on the elicited betting measures as well as the index, which uses these measures in its construction. The effect of the saving box Columns (1)-(3) use difference in difference measurement. Columns (4)-(6) use cross section for only Wave 1. Use of individual fixed effects for columns (1)-(3) prevent independent estimation of the lumpy prime.

Table A.24: Savings Box Treatment: All Saving Ability Heterogeneity

		Saving Ability Index Components				**Saving Experience Index Components**					
	(1) Low Save Abil	(2) Save Potential	(3) Liq Avail	(4) Big Family	(5) Save Index	(6) Exper Acct	(7) No MM	(8) No Rosca	(9) No Save Box	(10) Unsafe Storage	(11) HH Pressure
Savings Box	-0.255	-0.151	-0.176	-0.222	-0.183	-0.149	-0.201	-0.171	0.002	-0.236	-0.281
	(0.127)	(0.120)	(0.133)	(0.110)	(0.099)	(0.113)	(0.097)	(0.105)	(0.139)	(0.139)	(0.113)
Save Box x Low Measure	0.141	-0.062	-0.011	0.133	0.073	-0.078	0.235	-0.036	-0.296	0.106	0.233
	(0.181)	(0.174)	(0.176)	(0.185)	(0.210)	(0.178)	(0.216)	(0.181)	(0.179)	(0.183)	(0.178)
Mean Dep Var	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
P-Val: $\beta_1 + \beta_2 = 0$	0.373	0.091	0.107	0.548	0.552	0.099	0.859	0.159	0.009	0.271	0.728
Num Obs	986	986	986	986	986	986	986	986	986	986	986
Other Treats	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.527	0.537	0.526	0.528	0.531	0.533	0.526	0.532	0.531	0.526	0.537

Notes: This table shows heterogeneous response to the saving box treatment by different dimensions of saving constraints. Estimates implement a difference in differences specification. The betting index (a standardized measure of both reported and elicited betting demand) is the dependent variable for all columns. Each column estimates heterogeneity by people below the median in the measures indicated at the top of each column for columns (1)-(5) and for people facing the constraint mentioned in columns (6)-(11). Columns (2)-(5) are the components of the saving ability index used to define people with low saving ability. Columns (6)-(11) are the six components of the saving experiences index. No Acct=no saving account. No MM=No mobile money account, No Rosca=have never participated in a Rosca, HH pressure=Pressure to spend money. Save Potential is the share of weekly income that individuals could allocate to saving. Liq Avail is the reported biggest expenditures (relative to mean income) that an individual could make without needing to borrow. Exper Index is an index of saving experiences based on available saving options and pressures to spend.

Table A.25: Effect of Lumpy Primes on Demand for Tickets Offered, Proportion of Total

	(1) All	(2) All	(3) All	(4) All
Lumpy Good Prime	0.0353	0.0351	0.0354	0.0080
	(0.0188)	(0.0188)	(0.0188)	(0.0264)
Prime x Saving Index			-0.0374	
			(0.0192)	
Prime x Low Saving Index				0.0546
				(0.0372)
Low Saving Index				-0.0159
				(0.0338)
Saving Index		-0.0010	0.0179	0.0032
		(0.0095)	(0.0131)	(0.0144)
Mean Dep Var	0.6228	0.6228	0.6228	0.6228
Mean Y-Control	0.6058	0.6058	0.6058	0.6058
P-Val: $\beta_1 + \beta_2 = 0$	.	.	.	0.0181
Full Set of Covariates	No	Yes	Yes	Yes
Price of Ticket FE	Yes	Yes	Yes	Yes
Other Treatments	Yes	Yes	Yes	Yes
Num Obs	1801	1801	1801	1801
Adj R2	0.0380	0.0439	0.0455	0.0440

Notes: Results from regression of $B_i = \beta_0 + \beta_1 LumpyPrime_i + \lambda X_i + \epsilon_i$. Dependent variable is 0-1, share of the maximum number of tickets offered selected by the respondent (4 offered in the full study sample and 2 in mini study sample). *LumpyPrime* is an indicator for going through the lumpy prime dialog prior to the ticket offer. All regressions control for status of other treatments in the study and the amount of cash offered instead of tickets. Columns (2)-(4) also control for the price of the desired expenditure as well as whether it was purchased since the baseline for respondents in the full study. Columns (1) and (2) show stability of the estimated treatment effect regardless of specification. Columns (3) and (4) show heterogeneity of response by saving ability using the continuous saving ability index in column where positive is better ability to save (3) and a binary indicator of low saving ability for those with a saving ability index below the median in column (4). Robust standard errors are used to adjust for heteroskedasticity in the error term. .

Table A.26: Lumpy Primes - Heterogeneity by Saving Ability Index and Components

Panel (a): **Maximum Tickets**	(1) Saving Potential	(2) Liquidity Available	(3) Inv IHH Size	(4) Save Exper Index	(5) Saving Ability Index	(6) Low Saving Ability
Lumpy Prime	0.066	0.067	0.066	0.066	0.067	0.021
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.033)
Prime x Heterogeneity	-0.029	-0.008	-0.027	-0.054	-0.056	0.092
	(0.024)	(0.023)	(0.023)	(0.024)	(0.024)	(0.047)
Heterogeneity	-0.002	0.021	0.008	0.025	0.027	-0.047
	(0.017)	(0.016)	(0.017)	(0.016)	(0.017)	(0.033)
Mean Dep Var	0.4542	0.4542	0.4542	0.4542	0.4542	0.4542
Num Obs	1801	1801	1801	1801	1801	1801
Adj R2	0.0248	0.0244	0.0240	0.0260	0.0263	0.0252
Panel (b): **Number Tickets**	(1) Saving Potential	(2) Liquidity Available	(3) Inv IHH Size	(4) Save Exper Index	(5) Saving Ability Index	(6) Low Saving Ability
Lumpy Prime	0.035	0.035	0.035	0.035	0.035	0.008
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.026)
Prime x Heterogeneity	-0.029	-0.013	-0.021	-0.015	-0.037	0.054
	(0.019)	(0.018)	(0.019)	(0.019)	(0.019)	(0.037)
Heterogeneity	0.008	0.011	0.007	0.010	0.018	-0.021
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.026)
Mean Dep Var	0.6228	0.6228	0.6228	0.6228	0.6228	0.6228
Num Obs	1801	1801	1801	1801	1801	1801
Adj R2	0.0448	0.0438	0.0441	0.0437	0.0455	0.0445

Notes: Outcome variable is maximum tickets demanded in the betting ticket offer. Columns indicate the dimension of heterogeneity explored in the regression. This table looks at the effect of the prime by the overall saving ability index and its sub-components. Low saving ability is being below the median for the overall saving ability index. Columns (1)-(5) are all coded so that positive is having better saving ability. Saving potential = the amount people could put to saving without unduly stressing household finances relative to mean income. Liquidity available = biggest expenditure they could afford without borrowing. Inv HH Size is the inverse log of household size to assess strain on finances. Save Exper Index is an index of survey responses reflecting available saving locations, security of saving, and pressure to make expenditures. All measures in columns (1) - (5) are standardized.

Table A.27: Lumpy Primes - Heterogeneity by Saving Experience Index and Components

Panel (a) **Maximum Tickets**	(1) Ever Rosca	(2) No Pressure	(3) Safe Home	(4) Bank Acct	(5) Mobile Money	(6) Lockbox/ Piggy
Lumpy Prime	0.136	0.077	0.077	0.085	-0.025	0.054
	(0.039)	(0.037)	(0.030)	(0.031)	(0.067)	(0.035)
Prime x Heterogeneity	-0.109	-0.017	-0.025	-0.045	0.105	0.011
	(0.049)	(0.048)	(0.047)	(0.047)	(0.071)	(0.059)
Heterogeneity	0.057	0.033	0.011	-0.020	-0.036	-0.026
	(0.034)	(0.033)	(0.033)	(0.033)	(0.051)	(0.041)
Mean Dep Var	0.4542	0.4542	0.4542	0.4542	0.4542	0.4682
Num Obs	1801	1801	1801	1801	1801	1256
Adj R2	0.0259	0.0237	0.0233	0.0252	0.0244	0.0247

Panel (b) **Proportion Tickets**	(1) Ever Rosca	(2) No Pressure	(3) Safe Home	(4) Bank Acct	(5) Mobile Money	(6) Lockbox/ Piggy
Lumpy Prime	0.083	0.020	0.048	0.052	-0.014	0.035
	(0.032)	(0.030)	(0.025)	(0.025)	(0.054)	(0.027)
Prime x Heterogeneity	-0.074	0.025	-0.033	-0.042	0.056	-0.012
	(0.039)	(0.038)	(0.037)	(0.038)	(0.058)	(0.046)
Heterogeneity	0.049	0.005	0.039	-0.033	-0.026	-0.020
	(0.027)	(0.026)	(0.026)	(0.027)	(0.041)	(0.032)
Mean Dep Var	0.6228	0.6228	0.6228	0.6228	0.6228	0.6483
Num Obs	1801	1801	1801	1801	1801	1256
Adj R2	0.0455	0.0440	0.0445	0.0479	0.0438	0.0442

Notes: Outcome variable is either maximum or proportion of tickets demanded in the betting ticket offer. Columns indicate the dimension of heterogeneity explored in the regression. This table looks at the effect of the prime by the saving experience index and its sub-components. All columns reflect binary dimensions of heterogeneity assigned one for positive characteristics and zero otherwise. The overall index is the standardized sum of the pieces as reported at baseline. Saving Exper Index is the standradized sum of the components.

Table A.28: Lumpy Primes by Betting for Desired Expenditure

	(1) Max	(2) Max	(3) Num	(4) Num
Lumpy Prime	0.087	0.028	0.045	-0.007
	(0.042)	(0.049)	(0.036)	(0.041)
Prime x Get Bet		0.250		0.220
		(0.098)		(0.083)
Get Bet		-0.016		-0.026
		(0.070)		(0.061)
Mean Dep Var	0.4220	0.4220	0.5642	0.5642
P-val: $\beta_1 + \beta_2 = 0$	.	0.0010	.	0.0029
Num Obs	545	545	545	545
Adj R2	0.0214	0.0386	0.0247	0.0412

In the condensed study, 25% of respondents listed betting as one of their likely sources of liquidity for a desired expenditure. Get Bet is an indicator for this response.

Table A.29: Lumpy Expenditure Primes and Patience

	(1) Max	(2) Max	(3) Max	(4) Prop	(5) Prop	(6) Prop
Lumpy Prime	0.067	0.065	0.100	0.035	0.041	0.068
	(0.023)	(0.040)	(0.047)	(0.019)	(0.032)	(0.038)
Prime x Beta		0.003			-0.013	
		(0.071)			(0.057)	
Prime x Delta			-0.058			-0.056
			(0.071)			(0.057)
Beta	0.008	0.007	0.009	0.006	0.012	0.006
	(0.049)	(0.060)	(0.049)	(0.038)	(0.046)	(0.038)
Delta	0.036	0.036	0.064	0.048	0.048	0.075
	(0.049)	(0.049)	(0.060)	(0.038)	(0.038)	(0.047)
Mean Dep Var	0.4542	0.4542	0.4542	0.6228	0.6228	0.6228
Mean Y-Control	0.4220	0.4220	0.4220	0.6058	0.6058	0.6058
Num Obs	1801	1801	1801	1801	1801	1801
Adj R2	0.0233	0.0228	0.0231	0.0446	0.0441	0.0446

Notes: This table looks at heterogeneity of the lumpy prime effect by different measures of patience. Max indicates maximum number of possible tickets demanded. Prop indicates the proportion of possible tickets offered demanded. regressions control for the full set of covariates, other treatments, and value of cash offered.

Table A.30: Effect of Budgeting Exercise Time Updates on Betting Demand

	(1)	(2)	(3)	(4)
	Max	Max	Max	Max
Lumpy Good Prime	0.077	0.073	0.072	0.074
	(0.042)	(0.042)	(0.042)	(0.042)
Betting Exercise (BE)	-0.022	0.004	-0.045	-0.031
	(0.045)	(0.050)	(0.071)	(0.081)
BE x Time Update		-0.012	-0.028	-0.036
		(0.011)	(0.016)	(0.018)
Time Update		0.009	0.011	0.018
		(0.005)	(0.008)	(0.009)
BE x Time Update x Beta			0.042	
			(0.030)	
Time Update x Beta			-0.006	
			(0.015)	
BE x Beta			0.124	
			(0.129)	
BE x Time Update x Delta				0.044
				(0.028)
Time Update x Delta				-0.017
				(0.014)
BE x Delta				0.062
				(0.123)
Beta	-0.030	-0.034	-0.078	-0.030
	(0.073)	(0.074)	(0.081)	(0.074)
Delta	0.060	0.068	0.071	0.057
	(0.070)	(0.071)	(0.071)	(0.081)
N	686	686	686	686
Control Group Mean	0.3714	0.3714	0.3714	0.3714
Mean Dep Var	0.4125	0.4125	0.4125	0.4125
R2	0.1453	0.1490	0.1551	0.1546
Adj R2	0.1183	0.1195	0.1218	0.1212

Notes: Time update is calculated based on the difference between their original guess of how long they would need to save for the lumpy expenditure and the amount of time it would take them to save after going through the budgeting exercise and making a more realistic assessment of how much they could save per week. Positive updates suggest longer amounts of time needed. These time update values are then converted using IHST for this analysis because of both negative and positive updates in the distribution of these updates.

Table A.31: Robustness: Effect of Betting Ticket Offer on Saving Update

	(1) USD	(2) Prop	(3) Positive	(4) Negative	(5) None
Saving Prime Treatment Group	-0.005	0.012	-0.009	0.032	-0.023
	(0.523)	(0.015)	(0.042)	(0.038)	(0.036)
N	686	686	686	686	686
Mean Dep Var	-1.4831	-0.0674	0.4883	0.2595	0.2522
R2	0.0000	0.0007	0.0001	0.0011	0.0006

Notes: This table provices a robustness check for the budgeting exercise. If conducting the budgeting exercise after the betting ticket offer affected the reported updates, the identification strategy would no longer be valid. These results show no evidence of the timing of the betting ticket offer affecting reported updates.
Outcome variables:
Column (1) Raw Update = Assisted Estimate of Save Ability − Naive Save Ability
Column (2) Prop Update = Raw Update / Weekly Income
Column (3) Positive Update = Update > 0
Column (4) Negative Update = Update < 0
Column (5) None = Update equal to 0.
$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.32: Effect of Budgeting Exercise on Demanding Maximum Betting Tickets - Minimal Covariates

	(1) NA	(2) USD	(3) Prop	(4) NA	(5) USD	(6) Prop
Lumpy Good Prime	0.082	0.079	0.079	0.080	0.079	0.080
	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
Budgeting Exercise (BE)	-0.027	-0.053	-0.064	0.025	-0.039	-0.046
	(0.048)	(0.048)	(0.049)	(0.089)	(0.058)	(0.061)
BE x Update		-0.018	-0.605			
		(0.006)	(0.227)			
Update		0.002	0.041			
		(0.003)	(0.128)			
BE x (Update $>$ 0)				-0.196		
				(0.117)		
BE x (Update $<$ 0)				0.006		
				(0.106)		
Update $>$ 0				0.051		
				(0.063)		
Update $<$ 0				-0.001		
				(0.056)		
BE x Positive Update Amount					-0.024	-0.892
					(0.011)	(0.567)
BE x Negative Update Amount					0.015	0.503
					(0.010)	(0.306)
Positive Update Amount					0.002	0.090
					(0.005)	(0.254)
Negative Update Amount					-0.003	-0.027
					(0.006)	(0.155)
N	683	683	683	683	683	683
Mean Dep Var	0.4129	0.4129	0.4129	0.4129	0.4129	0.4129
Control Group Mean	0.3689	0.3689	0.3689	0.3689	0.3689	0.3689
P-Value of Pos = -1 * Neg Update				0.0398	0.5995	0.5909
Adj R2	0.0167	0.0235	0.0230	0.0176	0.0209	0.0204

Notes: This table is a robustness check for main results on the budgeting exercise, using a more limited number of covariates. Prop columns scaled to respondent income, USD in US dollars. Update = Assisted - Naive Estimate. Covariates: mean income, weekly betting amount, price of primed expenditure.

Table A.33: Effect of Budgeting Exercise on Number of Tickets Demanded

	(1) NA	(2) USD	(3) Prop	(4) NA	(5) USD	(6) Prop
Lumpy Good Prime	0.096	0.091	0.092	0.094	0.091	0.093
	(0.071)	(0.071)	(0.071)	(0.072)	(0.072)	(0.071)
Budgeting Exercise (BE)	-0.080	-0.111	-0.127	0.046	-0.066	-0.065
	(0.076)	(0.076)	(0.078)	(0.137)	(0.091)	(0.096)
BE x Update		-0.023	-0.766			
		(0.011)	(0.372)			
Update		0.005	0.108			
		(0.005)	(0.199)			
BE x (Update > 0)				-0.337		
				(0.179)		
BE x (Update < 0)				-0.069		
				(0.167)		
Update > 0				0.113		
				(0.100)		
Update < 0				0.022		
				(0.086)		
BE x Positive Update Amount					-0.040	-1.772
					(0.019)	(0.932)
BE x Negative Update Amount					0.013	0.404
					(0.017)	(0.489)
Positive Update Amount					0.003	0.172
					(0.008)	(0.385)
Negative Update Amount					-0.007	-0.119
					(0.009)	(0.244)
N	683	683	683	683	683	683
Mean Dep Var	1.0908	1.0908	1.0908	1.0908	1.0908	1.0908
Control Group Mean	01.0574	01.0574	01.0574	01.0574	01.0574	01.0574
P-Value of Pos = -1 * Neg Update				0.0849	0.3357	0.2401
Adj R2	0.1835	0.1859	0.1858	0.1835	0.1849	0.1850

Prop columns scaled to respondent income, UGX in 1,000s. Update = Assisted - Naive Estimate
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Results from regression of $B_i = \beta_0 + \beta_1 LumpyPrime_i + \beta_2 Budget_i + \beta_3 (Budget \times Update)_i + \beta_4 Update_i + \lambda X_i + \epsilon_i$. Dependent variable is the number of tickets demanded (maximum of 2). $LumpyPrime_i$ is an indicator for doing the lumpy prime dialog before the betting ticket offer. $Budget_i$ is an indicator for doing the budgeting exercise before the betting ticket offer. $Update_i$ is the assisted estimate of the amount that an individual can save from the budgeting exercise minus the naive estimate. USD columns use the raw measure of the update in US dollars. Prop columns rescale this update relative to an individual's mean income. Individual covariates include background education, household characteristics, and preference variables as well as controls for other treatments during the study and the amount of cash offered instead of tickets. Robust standard errors are used to adjust for heteroskedasticity in the error term.

Appendix B: Sports Betting Details

B1: Odds, Payouts, and Betting Structure

A ticket's payout depends on the choices made by the bettor. Each predicted outcome included on a ticket is associated with a payoff multiplier, such that less likely outcomes are rewarded with higher multipliers. In order to win a ticket, every outcome it includes must have been accurately predicted. Even a single incorrect guess causes the entire ticket to fail. The payout for awinning tickt is the product of product of each of the selected multipliers and the amount of money wagered on that ticket.

For example, a bettor could bet on specific outcomes (win, loss, or tie) for each of four different matches. If these predicted outcomes had associated multipliers of 1.5, 2, 2, and 5 then his total multiplier is 1.5 x 2 x 2 x 5 = 30. If he bets 2 USD on this ticket and all four outcomes occur, he can redeem his winning ticket for 60 USD (minus taxes of 15% of winnings). If any of his four predictions do not occur, his ticket becomes worthless.

B2: Estimating the Rate of Return

Estimating the rate of return is complicated and requires some simplifying assumptions about the structure of bets and the odds being offered. The rate of return ultimately depends on the number of games included on a betting ticket and how much is being targeted. The likelihood that a given ticket wins goes down as the payout rises. However, a more subtle point is that the expected value of a ticket also goes down as tickets are added to the game and the target amount goes up. This is because betting companies only offer payoff multipliers that are beneath "fair" payoffs. In Uganda, this is estimated as a reduction of roughly 7-8% off of each multiplier. This was estimated from offered match multipliers on over 1,000 bets in Uganda.

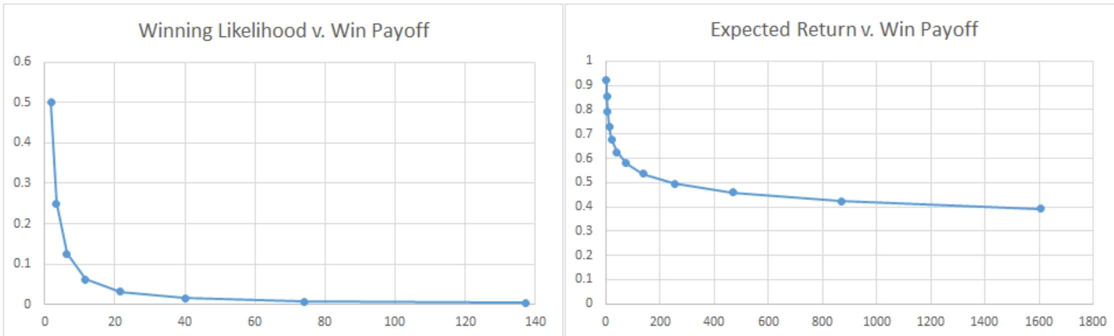
Because odds are offered for all possible outcomes of an event, it is possible to back out the company's per-match expected earnings. This is best illustrated with another example. Imagine a match with associated multipliers of 1.8 if Team A wins, 5.5 if Team B wins, and 2.7 if they tie. If betting companies were offering what they thought to be fair multipliers this would imply that they think the real likelihood that Team A wins is $\frac{1}{1.8} = .5556$. In other words, they would believe that for a dollar spent on this single game wager, they have a 44.44% chance of keeping the dollar and a they have a 55.56% chance that they have to return the dollar and add \$0.8 yielding an expected return of zero. The other two multipliers imply likelihoods of 0.1818 and 0.37. Together, these three probabilities add up to 1.1074. Of course, this is impossible since one and only one of the three outcomes can occur. Therefore, they must lower the payouts they offer in order to build in their profit margin. Without knowing the true odds, I need to make the assumption that they shade different sides of the bet similarly. This example suggests that they offered multipliers that they knew should have been 10.74% bigger on average, implying an average expected rate of return (no matter what side of the bet is chosen) of 0.903. On average across the bets in my data set, the expected payout is approximately 0.925 per dollar spent *for a single match prediction.*[1]

However, in order to get a larger payout, bettors typically add multiple games onto their tickets. In fact, most betting companies require a minimum of three matches per ticket. Imagine an individual puts five games on his ticket each of which have a true winning likelihood of 50%. The betting company will shade down its offered multiplier on that outcome by 7.5% and offer 1.85 on these outcomes. Spending one dollar on a ticket and placing five of these matches on a single ticket means that an individual could win \$21.67 if all matches occur as predicted. The true likelihood of the ticket winning is $0.5^5 = 3.125\%$. The rate of return will be $21.67 * 0.03125 = 0.677$. This could have also been calculated with the per ticket adjustment factor of 0.925, so that the expected value of a ticket is a function of the number of games on the ticket, in this example equal to $0.925^5 = 0.677$.

If a bettor exclusively predicted outcomes with "true" likelihoods of 50% and "unfair" multipliers would offer 1.85, we can see that the rate of return decreases with every ticket added. Figure A.7 shows what happens to the likelihood of winning (on the left) and to the expected return (on the right) for bets as targeted payoffs are increased by adding more games to the ticket. Each dot represents an additional game added to the ticket (moving

[1] Another way of seeing this wedge between "fair" multipliers and those offered locally can be seen by comparing local multipliers to those found on websites such as betfair.com. These sights offer subscription services to join and have access to what they claim are fair odds. Odds offered in Uganda are systematically lower than those offered online for the same predicted outcomes.

Figure A.7



from left to right). My estimation that bettors should expect to only win back between 50-70% of what they wager derives from these calculations and bettors reporting that they typically include 5-8 matches per ticket they play.

B3: Characterizing Weekly Betting Profiles

Amounts of winnings inherently depend on the types of bets and the amount being bet. However, the amount and types of bets that people make are chosen by the bettors themselves and likely reflect their financial situation and aspirations at the time of making those wagers. An ideal experiment would know exactly the likelihoods of winning and types of payouts demanded for every bet of every bettor, and controlling for their betting profile could, arguably, treat realized winnings as exogenous. A first, challenge is how to reasonably control for bettors' betting profiles based on available data.

I approximate these endogenously chosen betting amounts and profiles using an understanding of the structure of betting in Uganda along with reported betting behaviors by the bettors during the interviews. Collecting data on every single bet placed for every bettor in our sample would have been prohibitively time consuming and costly in the context of this study. Instead, to approximate the types of bets placed by bettors over a period of time I use information about a) how many tickets they purchased, N, b) the amount they spent, in total, on betting over that period of time, and c) the amount they were targeting to win on most of their tickets, W. From these three pieces of data I can calculate the mean "stake" spent on each ticket, $S = \sum_{n=1}^{N} /N$. Using this stake and targeted payout, I can approximate the likelihood of a single ticket winning as, $p = S/(W + 1.44)$. The factor of

1.44 in the denominator is used to build in presumed expected losses of 30% of the value of the ticket's purchase value.

Although I do not know these values for every individual ticket that a respondent buys, respondents characterized their bets each week. With this information, I calculate each of the moments of a bettors' betting portfolio in a given period of observation. The moments are calculated for a set of N bets with likelihood, p, and a payout amount W.

- **Mean:** $Np * W$
- **Variance:** $Np(1-p) * W$
- **Skewness:** $(1-2p)/\sqrt{Np(1-p)} * W$
- **Kurtosis:** $(1-6p(1-p))/(Np(1-p))$

In the regression results, I control for these four moments of a bettor's betting profile in that time period along with their squares and cubes. Another non-parametric approach similarly builds off of the core pieces of data I have about peoples' reported betting. I use quartiles of number of tickets, targetted payoffs, and inferred win likelihood with one additional bin for people who did not bet in that period to create $1 + (4x4x4) = 65$ non-parametric betting profile bins. I additionally control for a linear and quadratic number of betting tickets and the amount of money the person spent on betting in that time period.

For both approaches, the intention is to try and control for the types of bets (and accompanying intentions of the bettor) as captured by their reported betting behavior. To the extent that these approximate actual betting intentions, realized winnings may be considered effectively random.

The validity of either of these strategies depends on individual bettors not being able to consistently beat the odds, and assumes that bets are, in general, of equal expected value. This argument rests on an assumption that bettors in Uganda do not know more than the international betting markets that set the associated odds and payoffs with the games being offered. Recent research by Goddard (2013) confirms that, although some arbitrage opportunities existed 12 years ago, they have nearly vanished today. With so much money at stake in the global sports betting industry, the advancement of data driven analytics and expansion of data availability mean that when arbitrage opportunities exist, they get quickly bid away by those with better information. In Uganda these internationally calibrated odds are updated up until the moment a wager is actually placed, making it even more unlikely that a local bettor has seen an arbitrage opportunity before the market has adjusted and the live odds have been updated. For someone to be able to perform consistently better than these markets' predictions, they would need to know more about the offered bets than the market and in a way that is not captured by the types of bets they are placing and controlled for in the analysis.

An additional reason to be skeptical that local bettors are identifying subtle arbitrage opportunities is because bettors do not appear to be able to accurately understand the components of calculating joint probabilities or inferring what the offered probabilities imply about the relative likelihood of events. Just 27% of people in the sample understood that the likelihood of flipping two coins and getting double heads was 25%. Just 23% gave a correct answer that flipping three coins and getting all heads was between 10 and 15%. These results are essentially the same when the example given is linked to football teams on a betting ticket where you believe the outcome is 50% likely. 35% did not understand that adding a third coin must lower the overall likelihood of the joint outcome. Finally, just 28% (slightly worse than random with a choice set of three items) understood how to infer win probabilities from the odds as they are displayed and offered by betting shops. This does not rule out that there are a small set of highly sophisticated bettors, however it seems unlikely that very many are able to identify arbitrage opportunities from the multiplier offerings missed by the international markets.

Appendix C: Model and Comparative Statics

In this section, I outline a model of demand for betting as a method of liquidity generation and alternative to saving. The model is an extension and generalization of work by Crossley et al. (2016), allowing for the flexible form of gambles offered by sports betting operators in Uganda and in order to accommodate saving behavior. I use it to fix ideas and motivate the paper's empirical tests.

The model generates four main insights. First, demand for lumpy expenditures creates demand for gambles. Second, increased valuation of a lumpy expenditure will increase demand for gambles among people who cannot afford to make the lumpy expenditure. Third, demand for lumpy expenditures also creates demand for saving in an overlapping range of income levels as those who demand betting. Finally, improvement in saving ability will decrease demand for gambles as a method of liquidity generation.

Betting is a bundled good. It includes direct enjoyment from the activity of gambling and also serves as a financial asset with possible monetary payout. While enjoyment is undoubtedly an important component of betting demand, the model focuses on this latter feature, since the possibility of a payout is what makes betting distinct from other consumption goods and makes it a plausible method of liquidity generation (though not necessarily optimal).

C.1 Demand for Gambles

A rational agent wants to maximize expected utility subject to a budget constraint. His weekly income is Y and utility is derived from the consumption of one divisible good, D, and the possible purchase of a single unit of a lumpy good: $L \in \{0, 1\}$. Consumption of the divisible good yields utility $u(D)$, where $u'(D) > 0$ and $u''(D) < 0$. Purchase and consumption of the lumpy good yields a discrete utility payoff, η, and costs a price, P. The agent's utility is therefore: $v() = u(D) + \eta L$.

Figure A.1a shows that utility without purchase of L is conventional, concave utility: $u(D)$. However, if the individual has enough income, $Y > P$, then he must decide whether the extra utility from consuming L is worth the loss in utility from reducing consumption of D. Purchase of L is represented by a jump onto the upper curve. However, having spent P on the lumpy good, he gets the discrete utility payoff of η but can only spend the remainder of his income, $Y - P$, on the divisible good. Given his income level, the agent optimizes his utility by selecting the higher curve. The crossing point of the two curves, Y^*, is therefore the threshold at which individuals switch from not making to making the lumpy expenditure. The envelope of these two pieces is the utility maximizing value function for non-gamblers such that optimal utility is:

$$
\begin{aligned}
U^1() &= u(Y) &\qquad if &\qquad Y < Y^* \\
U^2() &= u(Y-P) + \eta &\qquad if &\qquad Y \geq Y^*
\end{aligned}
$$

Next, I allow for the possibility of making bets (or gambles). There are two stages of this single time period. In the first stage, an individual assesses his income, Y, and has the option of purchasing a betting ticket of any value, B. The ticket has a likelihood, σ, of resulting in net winnings of W. If purchased, the outcome of the lottery is immediately realized. Those who win purchase the lumpy good, while those who lose do not.[2] Therefore, the utility following a loss is $U^1(Y-B) = u(Y-B)$ while utility following a win is $U^2(Y+W) = u(Y+W-P)+\eta$. A betting choice of $[B,W]$ will result in expected utility somewhere on the segment between $U^1(Y-B)$ and $U^2(Y+W)$ determined by the likelihood of winning the bet, σ, such that expected utility for the bettor is:

$$
E[v(Y)] = \underbrace{\sigma[u(Y-P+W)+\eta]}_{If\ \ Win} + \underbrace{(1-\sigma)u(Y-B)}_{If\ \ Lose}
$$

Because bets in this setting are fully flexible, an agent can choose his "optimal" bet constituting the amount he risks, B, and the net amount he tries to win, W. This means that the best possible bet he could make, $[B^*, W^*]$, will be on the segment that is tangent to U^1 and U^2. These points of tangency will define the optimal bet for everyone with income levels between these endpoints. However, the optimal amount wagered, B, and the targeted net winnings, W, as well as the likelihood of winning, will depend on the individual's income.

If betting companies offered actuarially fair bets, then expected net winning or losses would be the same, such that $\sigma W = (1-\sigma)B$. Figure A.1b illustrates this optimal bet with fair odds for an individual with income $\tilde{Y}$. Utility after a loss is indicated at point A, while utility following a win is at point C. The likelihood of this fair bet winning is such that

[2]The decision of whether or not to buy L is deterministic once the result of the bet has been realized. Additionally, only people who will buy the lumpy good after a win have an incentive to make a gamble. This is because the concavity of $u(D)$ makes it so that using expected winnings on more of the divisible good gives less expected additional utility than the expected loss of utility when the gamble does not win.

$\frac{EA}{EC} = \frac{\sigma}{1-\sigma}$. A fair bet of $[B^*, W^*]$ results in expected utility at point E, which is an increase in expected utility from F to E. People with income level $Y < \tilde{Y} - B^*$ will be too poor to bet; no available fair bet will increase expected utility. Similarly, no one with income level $Y > \tilde{Y} + W^*$ will bet because no fair gamble improves on his direct consumption of L and D. I define the lower and upper endpoints of the range of income levels that demand fair bets as Y_m^B and Y_M^B, respectively.

Of course, betting shops do not offer fair odds. Instead, they decrease expected payouts in order to make profits by reducing the likelihood of winning. Figure A.2a shows that there is also demand for unfair gambles where the amount bet, B, and won, W are held constant but the likelihood of winning, σ, has been reduced below that offered by a fair bet. This can be seen graphically by tracing horizontally from the starting utility at point D toward the y-axis until it reaches the convex segment at point F. Win likelihoods as low as $\sigma_{min} = \frac{B-H}{B+W}$, illustrated on the figure, will still improve expected utility for an individual with income $\tilde{Y}$.

C.2 Increased Valuation of a Lumpy Expenditure

Next, increasing the valuation of a lumpy expenditure increases demand for bets. Anticipating the empirical strategy for my third result, I claim that increasing the salience of an expense is equivalent to an increase in its anticipated value.[3]

As before, Figure A.2a shows the range of income levels within which individuals demand fair bets, with the envelope as the "convexified" expected utility of the agent with fair bets. As before, the endpoints of this range are Y_m^B and Y_M^B for the minimum and maximum, respectively. An increase in the valuation of L shifts η upward, in turn increasing anticipated utility for all income levels at which the lumpy good is purchased.

Figure A.2b shows that this increase in η also shifts the location of the tangent line defining the range of bettors and their optimal bets. Both the top and bottom endpoints of this range shift downward such that $\frac{\partial Y_m^B}{\partial \eta} < 0$ and $\frac{\partial Y_M^B}{\partial \eta} < 0$. The downward shift in the upper

[3]This is consistent with experimental evidence from diverse settings whereby random variation in the salience of an item amplifies the valuation of that item. An example from Barber and Odean (2007) shows this phenomenon in the stock market when companies have unusually large or small single-day performances. Another example from Ho and Imai (2008) shows how salience of a third party political candidate resulting from random ordering on ballots leads to an increase in the candidate's resulting vote share.

bound shows that some people who could already afford the good are no longer willing to risk the possibility of losing their bet and then being unable to make the lumpy expenditure. For the empirical tests in this study, the relevant shift will be on the expansion of the lower bound of people who now demand gambles. This is because the lumpy expenditures used in the study were identified as being expenses that respondents could not afford at the time of the interview. For those who demand bets both before and after the shift, expected utility from betting and the amount spent on betting have both increased.

C.3 Demand for Saving

Saving is an alternative liquidity generation strategy. To allow for saving, I switch to a two time-period model. Keeping the model as simple as possible, gambling and saving decisions take place in the first period only and income, Y, is the same in both periods. Under these assumptions, the previous result defining an income range of betting demand is unaffected. However, there may be a range of incomes, also around Y^*, where saving to purchase L in the second period is preferred to spending all income on the divisible good.

Utility over two time periods is structured similarly to the single period, except that the second period is discounted by a factor $\delta \leq 1$. When saving, the agent chooses how much income to set aside for use in the next period, S, such that $S \leq Y$. However, all of S may not make it to the second period. γ represents the return on savings. Although γ could be > 1 if saving resulted in interest payments, positive interest savings accounts are not typically available to this population. In fact, γ is likely ≤ 1 due a range of well-documented factors including possible loss, theft, inflation, or exposure to temptation.

Without positive interest, the agent would never save if saving did not result in purchase of L.[4] Therefore, two-time-period utility for a saver (purchasing L in the second period) is maximized with the choice of S^*:

$$\max_S V_s(Y) = u(Y - S) + \delta[u(Y + \gamma S - P) + \eta]$$

[4]This is the result of the concavity of $u()$ such that, even before considering time discounting or savings losses, additional marginal utility from consumption of D in period two would be less than the utility from spending that money on consumption of D in the first period.

For graphical clarity, I have set $\delta = 1$ and $\gamma = 1$ in the figures. Figure A.3a shows that the same individual with income $\tilde{Y}$ would be willing to sacrifice S^* of consumption in the first period for additional consumption in the second. The horizontal axis is still the income level, as it was for betting, but the vertical axis is now average utility over two periods. Period 1 utility will be at N and period 2 utility at Q, leading to average two-period utility M, and a gain of utility over not saving equal to $M - R$. Figure A.3b shows the locus of optimized saving utilities for each income level. Again, the envelope of the non-saving utility function and utility from optimal saving will constitute the new, maximized indirect utility function of potential savers. The region $Y \in [Y_m^S, Y_M^S]$ defines the range of income levels for which saving is welfare improving. Similar to betting, we observe that, if this region is non-empty, then $Y^* \in [Y_m^S, Y_M^S]$ and betting and saving will both be welfare improving in some area around Y^*.

When both betting and saving are welfare improving, the agent's choice will be determined by parameter assumptions in the model. In particular, higher levels of patience, δ, will make saving relatively more attractive, whereas less fair bets (lower σ given a choice of B and W) will lower the value of betting relative to saving.

C.4 Changes in Saving Ability

The ability to transfer income from the first to the second period is captured by the parameter γ. A rise in γ will lead to an increase in utility from a saving strategy at all income levels. This is simply because there is now more potential income to be spread across the two periods. An increase in saving ability also pushes the locus of optimal saving utilities upward. Figure A.3c illustrates this shift, showing that the end points of this range for saving have also moved outward such that $\frac{\partial Y_m^S}{\partial \gamma} < 0$ and $\frac{\partial Y_M^S}{\partial \gamma} > 0$.

When $[Y_m^B, Y_M^B] \cap [Y_m^S, Y_M^S]$ is non-empty, and both strategies of liquidity generation are preferred to direct consumption, parameter assumptions will determine which strategy is preferred. An increase of γ will expand this range of potential overlap while also resulting in more utility from saving. This will lead to a weak decrease in demand for bets as they become a relatively less appealing method of liquidity generation.

Before proceeding, we should remember that betting is a bundled good. The other component of its appeal is direct enjoyment, which should behave like other normal goods captured in the model by D. As saving ability improves, an individual increases the total amount set aside for saving such that $\frac{\partial S^*}{\partial \gamma} > 0$. Because consumption of divisible goods in period one is equal to $Y - S$, the increase in saving ability decreases today's consumption. Therefore, a positive change in saving ability affects the consumptive portion of betting demand similarly to the general shift in consumption towards the future.

To show that improved saving ability reduces demand for betting as a liquidity generation strategy as outlined in the model, I first observe that an individual will only save if after saving he purchases the lumpy good L. This is because of the concavity of $u()$, the assumption that $\gamma \leq 1$, and because income is stable so that the added consumption of the divisible good in the second period will result in less utility in the second period than that sacrificed from period one consumption. The optimal saving choice will therefore be:

$$\max_S u(Y - S) + \delta[u(Y + \gamma S - P) + \eta] \qquad\qquad s.t. \quad S \leq Y$$

The first order condition is:

$$-u'(Y - S^*) + \delta\gamma u'(Y + \gamma S^* - P) = 0$$

I then differentiate again with respect to γ and S in order to show the effect of improved saving ability on amount saved.

$$ds[u''(Y - S^*) + \delta\gamma^2 u''(Y + \gamma S^* - P)] + d\gamma[\delta u'(Y + \gamma S^* - P) + \delta\gamma S^* u'(Y + \gamma S^* - P)] = 0$$

Reorganizing:

$$\frac{ds}{d\gamma} = -\left[\frac{\overbrace{\delta u'(Y + \gamma S^* - P)}^{>0} + \overbrace{\delta\gamma S^* u'(Y + \gamma S^* - P)}^{>0}}{\underbrace{u''(Y - S^*)}_{<0} + \underbrace{\delta\gamma u''(Y + \gamma S^* - P)}_{<0}}\right]$$

Both terms in the numerator are first derivatives of the utility function and therefore positive. Both terms in the denominator are second derivatives of the utility function and therefore negative. Therefore, $\frac{dS^*}{d\gamma} > 0$.

An increase in S^* results in a decrease in period one consumption of D because $D = Y - S$. It is worth noting that the part of betting demand that comes from consumption as a normal good will be included in D.

Although the optimal saving amount will increase for everyone, people will only actually save if the utility from saving is bigger than the utility from either purchasing the lumpy expenditure in both time periods or purchasing it in neither without saving.[5]

Next, I show that the increase in saving ability also increases the upper bound of people who save and decreases the lower bound, leading to an expansion of the range of incomes for people who save.

First I show that the upper bound will increase. There are now two equilibrium conditions, optimal savings and equality of saving and direct purchase[6]:

$$
\begin{aligned}
-u'(Y-S) + \delta\gamma u'(Y + S\gamma - P) &= 0 \\
u(Y-S) + \delta u(Y + S\gamma - P) + \eta - (1+\delta)[u(Y-P) + \eta] &= 0
\end{aligned}
$$

I take derivatives and put them into matrix form omitting the "*" from optimal saving to avoid clutter.

$$
\begin{bmatrix} u''(Y-S) + \delta\gamma^2 u''(Y+\gamma S - P) & -u''(Y-S) + \delta\gamma u''(Y+\gamma S-P) \\ -u'(Y-S) + \delta\gamma u'(Y+\gamma S-P) & u'(Y-S) + \delta u'(Y+\gamma S - P) - (1+\delta)u'(Y-P) \end{bmatrix} \begin{bmatrix} dS \\ dY \end{bmatrix} = \begin{bmatrix} -\delta u'(Y+\gamma S-P) - \delta\gamma S u''(Y+\gamma S-P) \\ -\delta S u'(Y+\gamma S-P) \end{bmatrix} d\gamma
$$

The determinant of the coefficient matrix is positive because the top left term is negative (second derivatives of utility maximization), the bottom right is negative (the last term is bigger in magnitude than the first two because $P > S$), and the bottom left term is equal to zero. Following Cramer's rule I replace the second column with the column from $d\gamma$. This

[5]For direct consumption of the lumpy good to be optimal in the first period, it must be optimal in the second as well. Therefore, the relevant comparison for saving to be welfare improving is with consumption in both or neither time period.

[6]If there is a crossing, it will be a single crossing. This is because the marginal utility of $((1+\delta)u'(Y-P) > u'(Y-S) + \delta u'(Y+\gamma S-P)$ so that the direct purchasing utility cuts up through the optimal saving utility and will not cross again.

will be positive as well and therefore $\frac{dY^{Max}}{d\gamma} > 0$.

Following a similar approach as for the upper bound of saving, I look at the effect of a change in saving ability on the lower bound of saving. There are again two equilibrium conditions. Now, they are optimal savings and equality of utility from saving and direct purchase of the good[7]:

$$
\begin{aligned}
-u'(Y-S) + \delta\gamma u'(Y+S\gamma-P) &= 0 \\
u(Y-S) + \delta[u(Y+S\gamma-P)+\eta] - (1+\delta)u(Y) &= 0
\end{aligned}
$$

I take the derivatives and re-organize in matrix form:

$$
\begin{bmatrix} u''(Y-S) + \delta\gamma^2 u''(Y+\gamma S-P) & -u''(Y-S) + \delta\gamma u''(Y+\gamma S-P) \\ -u'(Y-S) + \delta\gamma u'(Y+\gamma S-P) & u'(Y-S) + \delta u'(Y+\gamma S-P) - (1+\delta)u'(Y) \end{bmatrix} \begin{bmatrix} dS \\ dY \end{bmatrix} = \begin{bmatrix} -\delta u'(Y+\gamma S-P) - \delta\gamma S u''(Y+\gamma S-P) \\ -\delta S u'(Y+\gamma S-P) \end{bmatrix} d\gamma
$$

The derivative of the coefficient matrix is now negative (because $(1+\delta)u'(Y) < u'(Y-S) + \delta u'(Y+\gamma S-P)$). Replacing the second column of the coefficient matrix with the column for $d\gamma$ and taking the determinant now results in a positive. Therefore $\frac{dY^{min}}{d\gamma} < 0$.

Together, these results show that an increase in saving ability a) increases the amount that people save, S^* which also reduces the amount spent on current divisible good consumption, $D = Y - S^*$, b) the maximum income level for people to prefer saving, Y^M has increased, and c) the minimum income level for people to prefer saving, Y^m has fallen so that the overall range of incomes where saving is preferred has increased.

Appendix D: Contrasting Saving and Betting

In this paper, I have framed saving as the primary alternative to betting, consistent with survey responses from the study's participants. The results in the main paper provided further empirical evidence corroborating these reported motivations. This section explores

[7]If there is a crossing, it will be a single crossing. This is because the marginal utility of $((1+\delta)u'(Y) < u'(Y-S) + \delta u'(Y+\gamma S-P)$ so that the saving utility cuts up from below and will not cross again.

how betting performs relative to saving as a pure financial asset.

Stashing money under one's mattress may be better than 35-50% expected losses from betting, but it may not. Participants reported a number of challenges impeding their ability to save effectively, citing risk of theft, pressure from family or friends, and personal temptation. These all contribute to expected "losses" when money is set aside for saving. Inflation lowers this effective interest rate further. Ultimately, given his level of patience, an individual has to consider this expected return on saving and compare it to the return on betting when deciding whether to allocate his money to one or the other strategy.

Acknowledging that different saving strategies have different cost and benefit structures, I use the simplest form of saving, cash savings, as a benchmark to compare saving and betting strategies. From what is known about the structure of betting, I calculate the expected payoff to a person using betting to pursue a desired expenditure. I similarly calculate the expected payoff to that same person if he instead pursues a (cash) saving strategy. I can then identify the return on saving which makes a person indifferent between saving and betting for his given level of patience over a reasonable range patience levels.

D1: Balancing Patience and Return on Saving

Imagine that an individual is trying to raise money for a lumpy expenditure that will cost him P_L. The lumpy expenditure is assumed to be consumed immediately (such as a wedding) and the individual has an infinite time horizon.[8] He is trying to decide whether to devote a portion of his weekly income, S, to either saving or betting in order to try and make the expenditure. He will pursue either strategy until he is able to make his purchase, at which point he immediately enjoys its utility payoff, η and then spends the rest of his life consuming only divisible goods. As in the original model, his single period utility is $u(D) + L\eta$.

If he saves, he expects it will take him $K = \frac{P_L}{S\gamma}$ weeks to accrue the liquidity needed to purchase L, where γ is the rate of return on savings. Note that as γ falls, there is slippage in savings and the amount of time required to accrue the needed liquidity increases. For each period that he saves, he sacrifices some amount of consumption of the divisible good, D, and

[8] This could also be modeled with a durable good and generate similar results. Similarly, the assumption that he lives for infinite time periods could be relaxed and generate similar results as well.

forgoes current utility of ψ such that $\psi \equiv u(Y) - u(Y-S)$. He anticipates a discrete utility payoff of η once he is able to make the lumpy expenditure and δ is his future discounting factor. Expected net utility from saving is therefore:

$$-\sum_{0}^{K} \delta^t \psi + \delta^K \eta = \frac{-\psi(1-\delta^K)}{1-\delta} + \delta^K \eta$$

If instead he chooses to bet, winnings from betting are assumed to be immediately used in their entirety on the lumpy good. The likelihood of winning his bet is p. If he wins, he enjoys η. If he does not, then he will bet again in the next (discounted) period where, again, the likelihood of winning is p. This suggests that expected utility from betting is therefore:

$$-\psi + p\eta + (1-p)\delta[-\psi + p\eta + \delta(1-p)[-\psi \quad ... \quad ... \quad = \frac{-\psi + p\eta}{1-(1-p)\delta}$$

This strategy becomes a geometric sum with the base value of $\psi + p\eta$ and the discount factor of $\delta(1-p)$.

Setting saving equal to betting becomes:

$$\frac{-\psi(1-\delta^K)}{1-\delta} + \delta^K \eta = \frac{-\psi + p\eta}{1-(1-p)\delta}$$

Next, I want to parameterize this equation in order to solve for the minimum return on saving, γ^*, given an individual's level of patience, δ, before he switches from saving to a betting strategy. Imagine an individual is trying to raise 200,000 shillings for a desired lumpy expenditure (approximately 65 USD or about 2.3 times the median weekly income in the sample just above the median reported winning targets). He can either set aside 10,000 shillings per week for saving or spend them on betting. Based on the types of bets that bettors typically make from the data, I can estimate the likelihood that a bettor would win a 10,000 UGX bet targeting a payout of 200,000 UGX. This likelihood is $p = 0.03125$.[9]

[9] Bettors typically target bets with median multipliers of 1.85. This would require just under five games to be stacked on a bet in order to win at least 200K. Because of how the betting companies systematically lower the payouts on a per game basis. A multiplier of 1.85 that has been shaded down by 7.5% (as appears on average in the data), should have been a fair multiplier of 2. A fair multiplier of 2 implies a fair "true" probability of 50%. We can therefore infer that the true likelihood that a bet with five games on it, each with an offered multiplier of 1.85, has a winning probability of $p = 0.5^5 = 0.03125$.

The likelihood of losing is therefore $1 - p = 0.96875$. As a simplifying assumption, I set the recurrent cost of sacrificing 10,000 shillings in divisible expenditures equal to ten, and assume that the payoff from the lumpy expenditure is large and higher in total value than the marginal utility lost across each time period (with perfect saving this would be 200 thousand shillings). I try a low value for η of 300 and a high value of 3,000.

Next, I take a reasonable estimate for peoples' weekly discount factors from research by Mbiti and Weil (2013) in neighboring Kenya. In their population, the authors estimate a yearly discount factor of 0.64 suggesting a weekly discount factor of approximately 0.9915. For each η-δ pair, there is a value of γ, γ^* that will make individuals indifferent between saving and betting. High values of γ^* suggest that only very small expected losses of saving can be tolerated before betting is preferred while a lower γ^* suggests substantial expected losses can be endured. Figure A.8 in the main paper shows these results in graphical form for weekly and yearly discount factors with a value of $\eta = 1000$. For Mbiti and Weil's estimated discount factor, threshold gamma will be 0.716. If it falls below 0.63, even the most patient people will prefer to bet.

D2: Estimating Return on Saving

Having established a range of threshold returns to saving that will separate bettors from savers, we need a way to estimate reasonable values for γ before we can say whether betting is likely to be a rational utility maximizing strategy. To do this, I propose that γ should be the product of a set of four contributing factors: inflation, temptation, social-pressure, and loss or theft. None of these are easy to estimate and, to my knowledge, there is little existing research examining this. In the absence of existing estimates, I try and use data and information about the local context to create reasonable approximations.

First, inflation in Uganda over the past five years has ranged from 4-24%. This corresponds with a weekly discount factor between 0.9947 and 0.9992. Conservatively estimating that it will take at least 20 weeks to save the needed liquidity for the expenditure, these weekly discount factors correspond with 20 week discount factor between 0.8998-0.9844.

Second, I look to the data for insight on losses from temptation. The survey included consumption modules including a number of temptation goods including weekly expenditures on video clubs, jewelry, soda, alcohol, and gifts for girlfriends. The median portion of income spent on these goods was 4.8%. In data from condensed study, I can show that, after removing essential recurrent expenditures on food, transport, and rent, only 42% of weekly income remained. This suggests that temptation goods use up $4.8/42 = 11.4\%$ of discretionary income. Because consumption of temptation goods is likely a source of enjoyment, all temptation expenditures should not be considered "losses", but we might suspect that some portion of them are not valued. I set a range whereby between 25 and 50% of these expenditures are non-valued (or regretted), constituting losses of 2.85-5.7% of total weekly income or 6.7-13.4% of discretionary income.[10]

In addition, betting itself is likely (partially) a temptation good. Assuming that bettors regret the expected losses of bets (but are comfortable with the amount won back) then the median bettor who spends 8.6% of his weekly income on betting regrets the expected losses of 40% of his betting expenditures. This results in additional expected losses equal 3.44% of weekly income or 8.2% of discretionary income. Taking the more conservative estimates of temptation expenditures and comparing them to total weekly income creates a lower bound of $2.85 + 3.44 = 6.29\%$ expected loss to temptation or a discount factor of 0.9361. The higher range of estimates while assuming that money for saving is mixed in with other discretionary income results in expected losses to temptation of $13.4 + 8.2 = 21.6\%$ of discretionary funds or a discount factor of 0.784.

Next, 27% of people in the full sample said that they feel considerable pressure to spend their earnings on other people so this is clearly a concern for many people in the population. Recent work has highlighted the importance of both inter and intra-household pressures on individuals' income (Ashraf, 2009; Baland et al., 2011; Goldberg, 2011). A recent paper by Jakiela and Ozier (2015) uses a set of lab-in-the-field experiments to identify participants'

[10]It may be unfair to assume that the same proportion of expenditures on temptation goods relative to total income or discretionary income would be taken out of money intended for saving. However, the saving box was a soft commitment saving device that did very little for the actual security of their money, aside from removing it from their own pockets and shielding it from exposure to the temptations they face throughout the day. Take up rates of over 50 percentage points in the saving box treatment are suggestive that people are indeed concerned about exposure of their own money to temptation. It is also possible that saving ultimately ends up being the residual of what people bring home at the end of the day. If this is the case, then the losses from temptation expenditures may cut *first* into saving before they affect less flexible expenditures.

willingness to sacrifice income in order for the size of their payouts to be hidden from others in the study. With these measures, they are able to back out the level of “Kin Tax” people expect to face from others in the study. Sizes of this kin tax vary considerably and are dependent on a number of factors and ranged from essentially zero up to eight percent, suggesting a discount factor of 0.92 - 1.

Finally, there is theft and loss. 30% of respondents in the study claimed that they had had their house robbed and money stolen. It is hard to know what rate of theft this implies. Assuming that these robberies happened within the last ten years, it would suggest that every year about 3% of people lose their money stored at home. In the minimum 20 week time window we are presuming in order to save successfully, this would be just 1.15% of participants. It might be that even low incidence of a salient outcome get overweighted in peoples’ decision-making (Bordalo et al., 2012), and pick-pocketing or losses of income when out of the house would not be captured in this survey measure, but to be conservative I will use discount factors between 0.9885-1.

A fifth possible factor could be transaction costs. In this example of cash-savings, transaction costs are considered to be zero. However, other saving technologies such as bank accounts or ROSCAs could impose significantly higher transaction costs either through formal fees or through demands on time and effort.

Together, I can construct a low and high range for γ keeping in mind that people will start to switch to betting if γ dips below 0.8. For the upper bound of gamma I take the product of the high γ_i estimates so that $\gamma_{high} = 0.9844 \times 0.9361 \times 1 \times 1 = 0.9215$. For all reasonable levels of patience, these people should clearly prefer saving to betting as a mode of liquidity generation and are likely betting primarily for non-financial motivation. On the other end of the spectrum are those using the lower estimates of each saving discount factor such that $\gamma_{low} = 0.8998 \times 0.784 \times 0.92 \times 0.9885 = 0.6415$. This estimate is below the floor at which we assumed most people would abandon saving and prefer to bet.

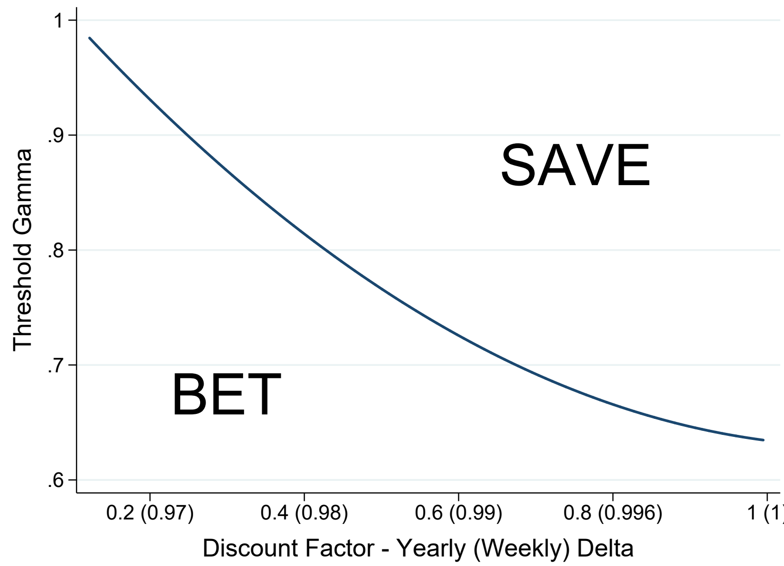
Of course, people save in many ways and each technology or saving strategy has its own benefits and drawbacks. Some alternative strategies may significantly improve the return on saving estimated above for cash savings. For many people, they likely do offer an improvement, or else rates of betting would be far higher and rates of saving far lower than even those seen in this select population. Bank accounts do exist in Kampala, and many respondents have them. But ATM locations are inconvenient and overcrowded leading to considerable lost time for either work or leisure. Focus group discussions revealed that deposit fees cost approximately 3% of the median respondent's weekly income and many accounts also charge withdrawal fees. All of these reduce the return and appeal of a bank saving strategy.

Rotating saving groups are also very common in Uganda and can greatly reduce the amount of time before a participant has access to his liquidity (Anderson and Baland, 2002). As both a benefit and a risk of group participation, social pressure acts as a commitment device for people who may not always follow through with their saving goals. However, these groups have their own limitations and rely on the efficacy of social sanctions among their members for the group to survive (Anderson et al., 2009). The rigidity of payment structures and the threat of social sanctions impose their own risks. Additionally, the amount of the contributions and payout are typically the result of a bargaining process among group members and may not correspond with an individual's personally optimal amounts or needs.

Finally, mobile money is becoming increasingly widespread in Uganda. However, since the time of the study, mobile betting services have followed quickly behind (Ssengooba and Yawe, 2014). Money put into a mobile money wallet that was previously shielded from temptation may now be even more exposed to impulsive betting.

There are undoubtedly many factors leading to such high demand for betting in this setting and with this population. Financial motivations may have seemed initially implausible or far-fetched, but given the constraints and challenges that many people face in their efforts to save, the gap between a return on betting and saving may be very small for many, if it exists at all.

Figure A.8: Separating Saving and Betting Preference by Saving Return Thresholds and Patience



Notes: This graph shows the threshold level of saving ability needed to sustain a saving strategy for each level of patience, based on calculations from the model developed in Section III and extended in Section VII. People with a given level of future discounting, δ, with a return on saving above the traced locus will be willing to save in pursuit of a lumpy expenditure. People whose saving ability is below that threshold level of γ will switch to betting. People will begin switching to betting as saving ability worsens until expected losses from saving approach 35%, at which point even the most patient people will switch to betting. Mbiti and Weil (2013) find a reasonable yearly discount factor of 0.64 in neighboring Kenya. This would imply a threshold γ of 0.716 at which people facing expected losses above 29% for money set aside to saving will prefer to bet.

Appendix E: Additional Field Targeting Protocols

Listing for Wave 1 was launched in September 2015 and took two weeks. The full set of 91 parishes in Kampala were identified. Because we planned to find and interview respondents at their place of work, we removed 39 parishes without significant commercial activity. Thirteen parishes were then randomly selected for Wave 1.

The field team visited one parish at a time, beginning at its commercial center. The main roads of the community were identified and divided among team members. These field officers were then instructed to walk along their designated route, looking for men who satisfied the targeting criteria. When they found someone suitable, they would approach him and include him in the listing by asking a few short questions to determine his eligibility and interest in participating in the study. After having identified a suitable respondent and including him in the listing, enumerators were instructed to skip the next eligible participant

Table A.34: Estimating Return on Cash Saving, γ

γ	Source	Estimate
γ_1	Inflation	0.8998 - 0.9844
γ_2	Temptation	0.784 - 0.9361
γ_3	Social Pressure	0.92 - 1
γ_4	Theft/Loss	0.9885 - 1
γ_5	Transaction Costs	1

Notes: γ is an individual's return on saving. This can be thought of as the portion of each dollar set aside for saving that he expects to actually be converted into an eventual expenditure on his desired saving target. γ is divided into sub-components in order to create a reasonable estimate of values for this population. γ is assumed to be the product of these sub-components. These components are approximated for cash savings as a benchmark, acknowledging that estimates would likely differ when using different saving instruments or strategies.

- γ_1 is based on the range of inflation rates in Uganda over the five years leading up to the study, 2011-2016.
- γ_2 is estimated from the consumption modules in the survey, categorizing certain expenditures as temptation goods (alcohol, video hall tickets, betting) and assuming that people regret between 25-50% of these expenses.
- γ_3 captures expenditures that are made out of obligation or as a result of inter- or intra- household pressure. This estimate is from a recent study by Jakiela and Ozier (2015).
- γ_4 was based on survey responses estimating the frequency of theft.
- γ_5 is assumed to be one for cash savings, but would be lower for most other saving technologies that require usage fees, coordination with others, or effort for either deposits or withdrawals.

These estimates imply a reasonable range for γ between 0.6415 and 0.9215. This range of γs falls considerably below the range of threshold γ^*s illustrated in Figure A.8, suggesting that there may be a considerable portion of the population for whom betting is a rationally preferred strategy to saving, given their levels of patience and return on saving.

they saw before approaching another potential respondent. This was an effort to mitigate the possibility of spillovers resulting from respondents who knew other people in the study.

Wave 2 was launched in March 2016. Participants were identified following identical protocols and targeting criteria in selected parishes as those in the initial group. The only change was that parishes were no longer randomly selected from the eligible list of locations. Logistic and budgeting considerations influenced the decision to work in areas that were more accessible to the field teams. Ultimately, an additional 23 communities were included in Wave 2.

Initially, efforts were made to stratify the random sampling of participants in the first wave by levels of betting intensity. This was abandoned as the logistics of doing replacements in the field with a quick timeline of implementation made it impossible. Although the bettors who participated in the study were ultimately similar to those in the listing, I therefore, am not making any claim that they are representative of them or of the population at large. Only that they are not a cherry-picked sample and that they look similar to many other men in Kampala.

The same targeting criteria were employed for people in the condensed study. Therefore the populations are very similar (though not identical) between full and condensed study participants. However, inclusion in the condensed study was no longer implemented in a two-stage approach with a listing followed by invitation into the study. Instead, if a suitable respondent was identified, he was invited to participate and, if willing, interviewed immediately. Field team members were instructed to exclude anyone with pre-existing knowledge of the research project.

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