Supplementary Material

Content Index:

Supplementary Figures:

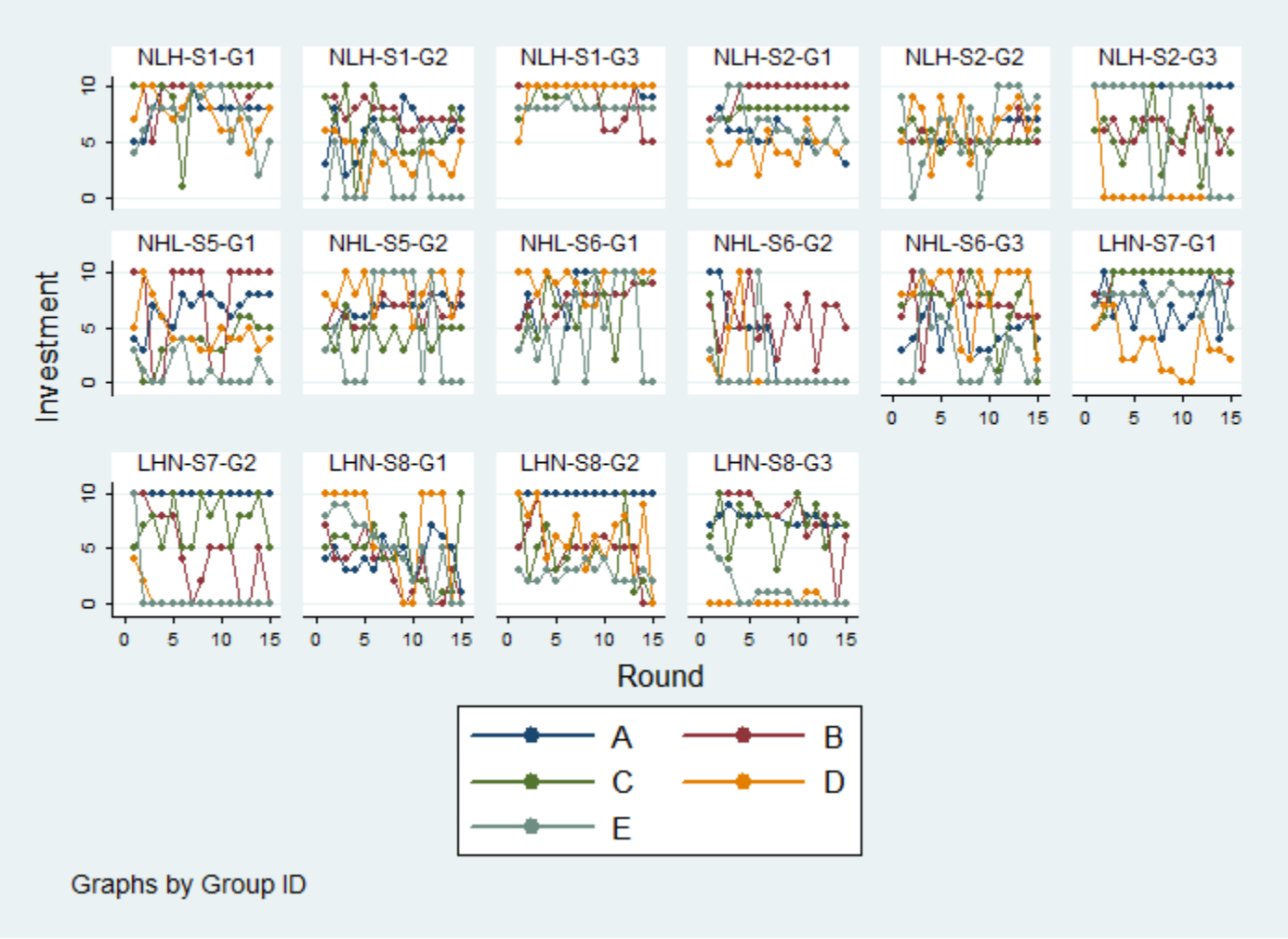


Figure S1: Investment per group per position. Each group is preceded by the treatment label (NLH = no, low and high Variability, NHL = no, high and low Variability; LHN = low, high and no Variability)

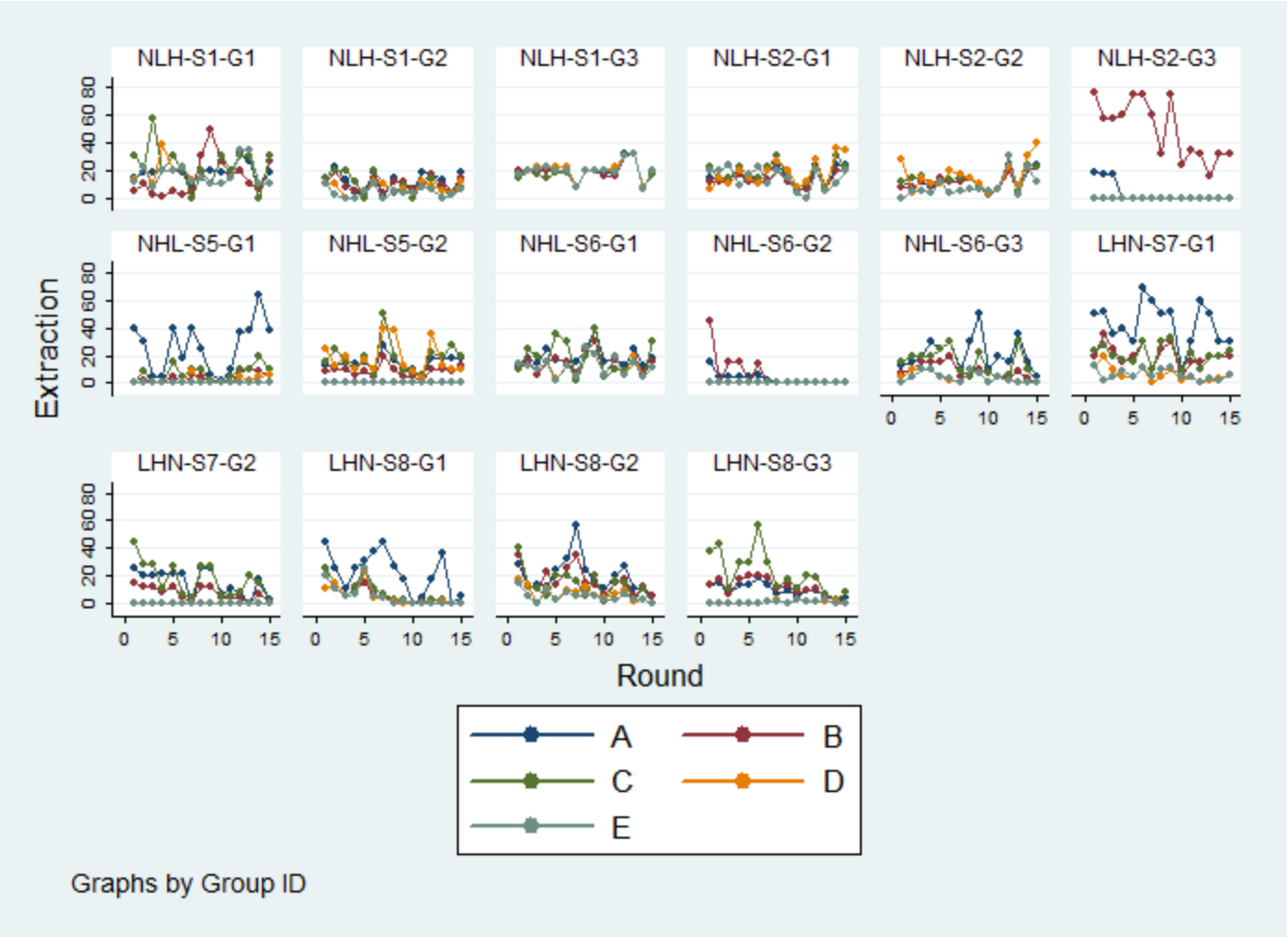


Figure S2: Extraction per group per position. Each group is preceded by the treatment label (NLH = no, low and high Variability, NHL = no, high and low Variability; LHN = low, high and no Variability)

Correlogram between variables

Table S1: Correlogram for variables at the individual level (only continuous variables)

	inv	ext	trust	worth	risk	eqshare	netgain
inv	1.0000						
ext	0.3577	1.0000					
trust	0.0115	-0.1572	1.0000				
worth	0.1468	0.1072	0.2786	1.0000			
risk	-0.0555	-0.0357	-0.0847	-0.1447	1.0000		
eqshare	0.2383	0.6511	-0.2034	0.1055	0.0150	1.0000	
netgain	-0.2081	0.8390	-0.1713	0.0267	-0.0051	0.5431	1.0000

Table S2: Correlogram for variables at the group level (only continuous variables)

	avginv	avgext	avgtrust	avgworth	avgrisk	extgini	invgini
avginv	1.0000						
avgext	0.7289	1.0000					
avgtrust	0.0916	0.0048	1.0000				
avgworth	0.0755	0.0419	0.1795	1.0000			
avgrisk	0.3800	0.3073	0.0265	0.4214	1.0000		
extgini	-0.3270	-0.3395	0.1409	-0.0425	0.0193	1.0000	
invgini	-0.8733	-0.6693	0.0300	-0.0512	-0.3220	0.3901	1.0000

Statistical Model

Estimating a model that assesses feedbacks between investments and extractions

The primary dependent variable in our statistical model, Investment, represents cooperation and level of collective action. Investment levels over time have been estimated explicitly addressing inter-temporal error term correlation and correlation of error terms present in the system depicted in eq 5 (i.e. correlation between $\varepsilon_{i,t}$ and $\upsilon_{i,t}$). Correcting for correlation between error terms follows empirical methodology used in economics (see for example Montalvo and Reynal-Querol 2005, Baggio and Papyrakis 2010). Correcting for correlation between error terms (in the manner proposed by Zellner (1962)), increases the efficiency of the estimated coefficients and decreases our system's sensitivity to specification errors.

Among other factors, Investment and Extraction decisions are a result of observed behavior measures such as Net Gain and Equal Share Ratio. The persistence of investment and extraction levels and consequentially, the metrics used for upstream user behavior (see Figures S1 and S2) bias our estimates. This bias is caused by the correlation between independent variables within the system and the actual system error terms (i.e. endogeneity). To avoid that bias we instrumented observed behavior (Net Gain, ESR) by using them as explanatory variables on upstream users' behavior (*Uub*). In other words, the observation variable is considered a latent variable that is a linear function of a combination of investment and extractions (i.e., Net Gain, ESR, Gini coefficient of investment or extraction). Instrumenting the observed behavior variable and using its lags avoids these error-variable correlation problems. In other words, we are making sure that *Uub* is not correlated with the systems' error terms. Therefore, we built a system of equations in which we took into account any correlation between error terms and corrected for autocorrelation.

To increase the robustness of our estimates we estimated the model in eq. 5 using the Asymptotically Distribution Free method (ADF) (Browne, 1984), a General Methods of Moments estimator (GMM). ADF (and GMM) allow estimates to be consistent and efficient when no distributional assumptions are made (i.e., when data are not jointly normal) (Hansen 1982). Using ADF increases robustness against correlation between the equation error terms and the explanatory variables used in the model--a condition that leads to endogeneity. However, ADF estimation requires, in general, large samples, because with small samples and complex models, ADF may lead to misleading results and achieving model convergence is problematic at best. In order to increase the reliability of our estimates and diminish convergence issues, we bootstraped our estimates and report bootstrapped standard errors over 500 repetitions.

Collinearity – possible problem

We checked variables for collinearity, finding a possible problem between average investment and investment Gini coefficient as hinted by the correlogram on averages. However, the two variables do not appear directly in the same equation, as investment Gini coefficient is used as an instrument and lagged.

Total Effects

The total effect is calculated summing the direct and indirect effect of an explanatory variable on the dependent variable. For example, if we follow Figure 7, trust affects investments directly, however, trust also affects extractions at time *t*, albeit indirectly through investment. Table 5, S3, S4 and S5 all report standardized total effects for the variables of interest. The use of standardized coefficients allows us to compare the effect of the different variables on investment and extractions even if variables are measured on different scales.

Table S2 reports total effect for the system estimated at the group level. Table S4 and S5 are a summary of effects for the model estimated at round 1 and the model estimated with the different specifications: with Net Gain, with Equal Share Ratio, and with both for the individual level; and investment Gini coefficient, Extraction

Gini coefficient and both for the group level. Tables S4 and S5 report standardized total effect for the first Round and the average, minimum and maximum standardized total effects for the NG, ESR and All (and Inv, Ext models for the group level) models as in Table 5 and S3. Table S4 and S5 also report how many times (in proportion) a variable was deemed significant in the ESR, NG and All models (or Inv, Ext and All for the group models), and if their effect is consistent (i.e., the fraction of times a variable was positive or negative, depending on the slight changes in the model specification). N represents the number of times a specific explanatory variable was included in the three different model specification (individual and group level).

References for Statistical Model Estimation and Justification:

Baggio, J. A., and E. Papyrakis. 2010. Ethnic diversity, property rights, and natural resources. *The Developing Economies*, 48(4): 473-495.

Browne, M. W. 1984. Asymptotically distribution-free methods for the analysis of covariance structures. *British Journal of Mathematical and Statistical Psychology*, 37(1): 62-83

Hansen, L. P. 1982. Large sample properties of generalized method of moments estimators. *Econometrica*, 50(4): 1029-1054.

Montalvo, J. G., and M. Reynal-Querol. 2005. Ethnic Diversity and Economic Development. *Journal of Development Economics* 76(2): 293–323.

Zellner, A. 1962. An Efficient Method of Estimating Seemingly Unrelated Regressions and Test for Aggregation Bias. *Journal of the American Statistical Association* 57(298): 348–68.

Table S3. Results for the Model reported in eq. 3 at the group level.

Variable	R1		Inv		Ext		All	
	avginv	avgext	avginv	avgext	avginv	avgext	avginv	avgext
Avg Extraction$_{t-1}^{+e}$			0.241*	0.198*	0.431*	0.289*	0.195*	0.156*
			(0.018)	(0.017)	(0.016)	(0.013)	(0.017)	(0.015)
Avg Investment		0.563		0.819*		0.671*		0.800*
		(0.501)		(0.036)		(0.013)		(0.033)
Low Variability^{+e}	0.570*	0.321	0.092*	0.076*	0.034	0.023	0.043*	0.035*
	(0.106)	(0.378)	(0.043)	(0.041)	(0.040)	(0.029)	(0.038)	(0.033)
High Variability^{+e}			0.065*	0.053*	0.099*	0.067*	0.089*	0.071*
			(0.046)	(0.042)	(0.039)	(0.028)	(0.043)	(0.039)
Normal Rainfall				0.434*		0.446*		0.439*
				(0.011)		(0.009)		(0.011)
High Rainfall		0.478		0.748*		0.754*		0.750*
		(0.659)		(0.022)		(0.022)		(0.021)
Treatment^{+e}	-0.706*	-0.398	-0.093*	-0.076*	-0.215*	-0.144*	-0.108*	-0.086*
	(0.075)	(0.411)	(0.028)	(0.024)	(0.025)	(0.017)	(0.029)	(0.024)
Avg Normalized Risk Scores^{+e}	-0.032*	-0.018	0.145*	0.118*	0.307*	0.206*	0.219*	0.175*
	(0.001)	(0.509)	(0.687)	(0.640)	(0.689)	(0.522)	(0.694)	(0.744)
Avg Trust^{+e}	-0.223*	-0.125	0.074*	0.061*	0.066*	0.044*	0.087*	0.069*
	(0.007)	(1.266)	(0.225)	(0.193)	(0.180)	(0.132)	(0.200)	(0.176)
Avg Trustworthiness		-0.062		0.007		0.022*		0.001
		(1.916)		(0.115)		(0.103)		(0.116)
Round			-0.018	-0.010	-0.111*	-0.080*	-0.061*	-0.047*
			(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
Upstream Users Behavior Inv			-0.583*	-0.398*			0.642	0.387
			(0.059)	(0.075)	0.742*		(2.443)	(1.533)
Upstream Users Behavior Ext					(0.155)	0.869*	0.239	0.321
						(0.307)	(7.353)	(10.268)
Gini Investment$_{t-1}^{++}$			-0.362*	0.620*			-0.469*	-0.283*
			(0.165)	(0.349)			(0.107)	(0.114)
Gini Investment$_{t-2}^{++}$			-0.194*	0.332*				
			(0.158)	(0.323)				
Gini Extraction$_{t-1}^{++}$					0.038*	0.044*	-0.127*	-0.171*
					(0.066)	(0.083)	(0.055)	(0.055)
Gini Extraction$_{t-2}^{++}$					-0.243*	-0.284*		
					(0.079)	(0.081		
N	80		1040		1040		1120	
Chi^2 p-value	n.a.		0.000		0.000		0.000	
Overall R^2	0.680		0.999		0.999		0.967	
Discrepancy	0.000		0.250		0.398		0.264	

Note: * = significant at the 95% level, bootstrapped standard errors in parenthesis. All coefficients are standardized and represent total effect. +e = Indirect effect due to Investment on Extraction ++ = Indirect effect due to Observed behavior. Position is compared to Position A, Treatment is comparing LHN and NHL to NLH. Rainfall is compared to low rainfall and Variability to no Variability.

Table S4: Summary for system coefficients at the Individual Level

Variable	Investment								Extraction							
	R1	avg	min	max	Sign+	Sign-	Sig	N	R1	avg	min	max	Sign+	Sign-	Sig	N
Extraction(t-1)$^{+e}$		1.874	0.371	2.667	1.000	0.000	1.000	3		0.378	0.116	0.760	1.000	0.000	1.000	3
Investment									-0.556	0.419	0.282	0.666	1.000	0.000	1.000	3
Position B	0.053	-0.027	-0.054	-0.012	0.000	1.000	0.333	3	-0.078	-0.034	-0.079	-0.006	0.000	1.000	0.333	3
Position C	-0.047	-0.025	-0.064	-0.005	0.000	1.000	0.333	3	-0.009	0.002	-0.048	0.042	0.667	0.333	0.667	3
Position D	-0.017	-0.100	-0.186	-0.055	0.000	1.000	1.000	3	-0.277	-0.069	-0.140	-0.018	0.000	1.000	0.667	3
Position E	-0.268	-0.148	-0.271	-0.086	0.000	1.000	1.000	3	-0.376	-0.106	-0.184	-0.050	0.000	1.000	1.000	3
NLH*LowVar^{+e}		0.044	0.042	0.048	1.000	0.000	0.333	3		0.017	0.005	0.036	0.667	0.000	0.333	3
NLH*HighVar^{+e}		0.003	-0.013	0.018	0.667	0.333	0.000	3		0.004	-0.003	0.014	0.333	0.333	0.000	3
LHNorNHL*NoVar^{+e}		-0.126	-0.215	-0.077	0.000	1.000	1.000	3		-0.065	-0.163	-0.009	0.000	1.000	1.000	3
LHNorNHL*LowVar^{+e}	-0.058	-0.079	-0.113	-0.048	0.000	1.000	1.000	3	0.032	-0.037	-0.086	-0.006	0.000	1.000	0.667	3
LHNorNHL*HighVar^{+e}	-0.338	-0.102	-0.184	-0.054	0.000	1.000	1.000	3	0.188	-0.054	-0.140	-0.006	0.000	1.000	0.667	3
Normal Rainfall										0.316	0.314	0.317	1.000	0.000	1.000	3
High Rainfall									0.587	0.460	0.440	0.482	1.000	0.000	1.000	3
Normalized Risk Scores^{+e}	0.102	0.008	-0.007	0.025	0.333	0.333	0.000	3	-0.057	0.007	-0.001	0.019	0.667	0.333	0.000	3
Trust+e	0.378	0.007	-0.010	0.036	0.333	0.333	0.333	3	-0.210	0.008	-0.003	0.027	0.333	0.667	0.333	3
Trustworthiness									0.108	-0.028	-0.045	-0.015	0.000	0.667	0.333	3
Round		0.723	-0.100	2.333	0.333	0.667	1.000	3		-0.048	-0.091	-0.011	0.000	0.667	0.667	3
UUB NG		-0.045	-0.166	0.036	0.333	0.333	0.333	3		0.693	0.625	0.760	1.000	0.000	0.500	2
UUB ESR		1.218	-0.066	2.501	0.500	0.500	0.500	2		0.070	0.002	0.138	0.500	0.000	0.500	2
Netgain(t-1)$^{++}$		-2.341	-2.399	-2.283	0.000	0.500	1.000	2		-0.069	-0.135	-0.002	0.000	1.000	0.500	2
Netgain(t-2)$^{++}$		-0.086	-0.091	-0.081	0.000	0.500	1.000	2		-0.003	-0.005	0.000	0.000	0.500	0.500	2
ESR(t-1)$^{++}$		-0.013	-0.032	0.007	0.500	0.500	0.500	2		0.132	0.115	0.148	1.000	0.000	1.000	2
ESR(t-2)$^{++}$		-0.021	-0.055	0.014	0.500	0.500	0.500	2		0.248	0.242	0.254	1.000	0.000	1.000	2

Note: R1 = effects on round 1. ++ = effects given indirectly due to the Observation variable. +e = Indirect effect on extraction, but direct on investment. Avg, min, max = average, minimum and maximum coefficient estimated (exclude R1 estimates). Sign + and Sign – indicate the fraction of times that the coefficient was positive or negative. Sig = fraction of times a coefficient was significant. N = number of models in which a variable was estimated

Table S5: Summary for system coefficients at the Group Level

Variable	Investment								Extraction							
	R1	**avg**	**min**	**max**	**sign +**	**sign -**	**sig**	**N**	**R1**	**avg**	**min**	**max**	**sign +**	**sign -**	**sig**	**N**
Avg Extraction $_{t-1}^{+e}$		0.289	0.195	0.431	1.000	0.000	1.000	3		0.214	0.156	0.289	1.000	0.000	1.000	3
Avg Investment									0.563	0.763	0.671	0.819	1.000	0.000	1.000	3
Low Variability^{+e}	0.570	0.057	0.034	0.092	1.000	0.000	0.667	3	0.321	0.044	0.023	0.076	1.000	0.000	0.667	3
High Variability^{+e}		0.084	0.065	0.099	1.000	0.000	1.000	3		0.064	0.053	0.071	1.000	0.000	1.000	3
Normal Rainfall										0.440	0.434	0.446	1.000	0.000	1.000	3
High Rainfall									0.478	0.751	0.748	0.754	1.000	0.000	1.000	3
Treatment^{+e}	-0.706	-0.139	-0.215	-0.093	0.000	1.000	1.000	3	-0.398	-0.102	-0.144	-0.076	0.000	1.000	1.000	3
Avg Normalized Risk Scores^{+e}	-0.032	0.224	0.145	0.307	1.000	0.000	1.000	3	-0.018	0.167	0.118	0.206	1.000	0.000	1.000	3
Avg Trust^{+e}	-0.223	0.075	0.066	0.087	1.000	0.000	1.000	3	-0.125	0.058	0.044	0.069	1.000	0.000	1.000	3
Avg Trustworthiness									-0.062	0.010	0.001	0.022	1.000	0.000	0.333	3
Round		-0.063	-0.111	-0.018	0.000	1.000	0.667	3		-0.045	-0.080	-0.010	0.000	1.000	0.667	3
Upstream users behavior Ext		0.197	0.155	0.239	1.000	0.000	0.000	2		0.595	0.321	0.869	1.000	0.000	0.500	2
Upstream users behavior Inv		0.029	-0.583	0.642	0.500	0.500	0.500	2		-0.005	-0.398	0.387	0.500	0.500	0.500	2
Gini Extraction$_{t-1}^{++}$		-0.045	-0.127	0.038	0.500	0.500	1.000	2		-0.063	-0.171	0.044	0.500	0.500	1.000	2
Gini Extraction$_{t-2}^{++}$		-0.243	-0.243	-0.243	0.000	1.000	1.000	1		-0.284	-0.284	-0.284	0.000	1.000	1.000	1
Gini Investment$_{t-1}^{++}$		-0.415	-0.469	-0.362	0.000	1.000	1.000	2		0.168	-0.283	0.620	0.500	0.500	1.000	2
Gini Investment$_{t-2}^{++}$		-0.194	-0.194	-0.194	0.000	1.000	1.000	1		0.332	0.332	0.332	1.000	0.000	1.000	1

Note: ++ = effects given indirectly due to the Observation variable. +e = Indirect effect on extraction, but direct on investment. Avg, min, max = average, minimum and maximum coefficient estimated. Sig + and Sig – indicate the fraction of times that the coefficient was positive or negative. Sig = fraction of times a coefficient was significant. N = number of models in which a variable was estimated.

Experiment Instructions and Forms

Italic: instructions for the experimenters
Normal: instructions read out loud for the participants

When people show up they sign consent form. Participants are seated in groups of 5, their positions determined randomly. When people are seated they are requested to complete the two exercise forms.

Welcome to the experiment. We will complete a number of exercises. You will be rewarded by cash payments at the end of the experiment based on the decisions you have made. Before we begin I ask you to turn off your mobile phones and other mobile devices so we will not be disturbed during the experiment.

We will now give you two exercises which you are asked to fill out. Please read the instructions carefully since your decisions will affect how much money you can earn. If you have questions raise your hand and we will address your question.

Exercise 1. *Risk aversion*

Exercise 2. *Trust games*

When the forms are collected, we will proceed to the irrigation experiment

Exercise 1

This exercise sheet lists ten decisions. Each decision is a paired choice between "Option A" and "Option B." You will make ten choices and record these in the final column, but only one of these choices will be used in the end to determine your earnings. Before you start making your ten choices, please let me explain how these choices will affect your earnings for this part of the experiment.

We will use a ten-sided die to determine the payoffs; the faces are numbered from 1 to 10. After you have made all of your choices, we will throw this die twice, once to select one of the ten decisions to be used, and a second time to determine what your payoff is for the option you chose, A or B, for the particular decision selected. Even though you will make ten decisions, only one of these will end up affecting your earnings, but you will not know in advance which decision will be used. Obviously, each decision has an equal chance of being used in the end.

Now, please look at Decision 1 at the top. Option A pays $2.00 if the throw of the ten sided die is 1 and it pays $1.60 if the throw is 2-10. Option B yields $3.85 if the throw of the die is 1, and it pays $0.10 if the throw is 2-10. The other Decisions are similar, except that as you move down the table, the chances of the higher payoff for each option increase. In fact, for Decision 10 in the bottom row, the die will not be needed since each option always pays the highest payoff, so your choice here is between $2.00 or $3.85.

To summarize, you will make ten choices: for each decision row you have to choose between Option A or Option B. You may choose A for some decision rows and B for other rows, and you may change your decisions and make them in any order. When you are finished, we will collect the forms. When we pay you your earnings at the end of today's exercises, we will throw the ten-sided die to select which of the ten Decisions

will be used, and a second time to determine your money earnings for the Option you chose for that Decision. Earnings for this choice will be added to your other earnings, and you will be paid all earnings in cash.

So now please fill in each of the empty boxes on the right side of the record sheet. You need to enter your choice, A or B, in each of these boxes.

Are there any questions? Now you may begin making your choices. Please do not talk with anyone while we are doing this; raise your hand if you have a question.

Die	Option A	Option B	Your Choice (A or B)
1	$2.00 – 1 $1.60 - 2, 3, 4, 5, 6, 7, 8, 9, 10	$3.85 – 1 $0.10 – 2, 3, 4, 5, 6, 7, 8, 9, 10	
2	$2.00 – 1, 2 $1.60 – 3, 4, 5, 6, 7, 8, 9, 10	$3.85 – 1, 2 $0.10 – 3, 4, 5, 6, 7, 8, 9, 10	
3	$2.00 – 1, 2, 3 $1.60 – 4, 5, 6, 7, 8, 9, 10	$3.85 – 1, 2, 3 $0.10 – 4, 5, 6, 7, 8, 9, 10	
4	$2.00 – 1, 2, 3, 4 $1.60 – 5, 6, 7, 8, 9, 10	$3.85 – 1, 2, 3, 4 $0.10 – 5, 6, 7, 8, 9, 10	
5	$2.00 – 1, 2, 3, 4, 5 $1.60 – 6, 7, 8, 9, 10	$3.85 – 1, 2, 3, 4, 5 $0.10 – 6, 7, 8, 9, 10	
6	$2.00 – 1, 2, 3, 4, 5, 6 $1.60 – 7, 8, 9, 10	$3.85 – 1, 2, 3, 4, 5, 6 $0.10 – 7, 8, 9, 10	
7	$2.00 – 1, 2, 3, 4, 5, 6, 7 $1.60 – 8, 9, 10	$3.85 – 1, 2, 3, 4, 5, 6, 7 $0.10 – 8, 9, 10	
8	$2.00 – 1, 2, 3, 4, 5, 6, 7, 8 $1.60 – 9, 10	$3.85 – 1, 2, 3, 4, 5, 6, 7, 8 $0.10 – 9, 10	
9	$2.00 – 1, 2, 3, 4, 5, 6, 7, 8, 9 $1.60 – 10	$3.85 – 1, 2, 3, 4, 5, 6, 7, 8, 9 $0.10 – 10	
10	$2.00 – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	$3.85 – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	

Exercise 2

In this exercise you will be randomly matched with another person in this room, but you will not know who that person is. That person will also not know who you are. You must write down your decisions for the possibility if you are selected to be Player 1 in this exercise or if you are selected to be Player 2.

The person randomly selected to be Player 1 has the following decision to make: You will receive 3 dollars and must decide how much to keep for yourself and how much to send to Player 2 in this room.

The amount you send to Player 2 will be tripled and then given to Player 2. Player 2 will decide how much to keep and how much to send back to you. For example, if you, Player 1, send 0 dollars to player 2, 0 dollars will be sent to player 2 and you will keep 3 dollars for yourself. However, if you choose to send 3 dollars to Player 2, those 3 dollars will be multiplied into 9 dollars and sent to Player 2. Player 2 would then decide how much to return to you.

Player 2 has the following decision to make: You have to choose for each of the 4 possible cases, how much to keep for yourself and how much to send back to player 1.

Please complete both tables for Player 1 AND for Player 2. We will randomly select whether you are Player 1 or Player 2 after we receive all these forms.

Are there any questions? If you have a question, raise your hand and I will try to answer it.

Player 1: **Please check ONE of the following allocations.**

Dollars kept by you	Dollars send to other	Received by other	**Check One Row**
$0	$3	(3x$3) = **$9**	
$1	$2	(3x$2) = **$6**	
$2	$1	(3x$1) = **$3**	
$3	$0	(3x$0) = **$0**	

Player 2: **Please enter your choice for ALL of the following allocations:**
(column 3 and 4 must add up to column 2)

Sent by other	Received from other	Kept by you	Send back to other
$0	(3x$0) = **$0**	$0	$0
$1	(3x$1) = **$3**		
$2	(3x$2) = **$6**		
$3	(3x$3) = **$9**		

INSTRUCTIONS FOR THE IRRIGATION GAME

Baseline Phase - No Variability

This exercise is intended to recreate a situation in which people must make decisions about using water to irrigate land. You have been selected to participate in a group of five individuals. You will play several rounds, each of which is roughly equivalent to an agricultural year or irrigation season.

In each round, you will have to make two decisions. First, each of you will have to decide how much to contribute into a public fund to maintain the irrigation canal. The sum of all the contributions to the fund will determine the quantity of water units that will be available to your group. In the second decision, you will take turns extracting water units from the system. Each unit you collect during the game is equivalent to 5 cents. For example, if you collect 200 units during the game, you will receive $10.

We will now discuss the first decision in detail. Each round, you will begin with 10 units to spend. You have to decide how many of those units to contribute into the public fund and how many to keep for yourself. You can think of this as the amount of labor you might invest into the maintenance of the irrigation system. The amount of effort you may contribute is between 0 and 10 units. You will enter your contribution quantity onto your Decision Form in Column A.

We will write down your contribution decision and calculate the quantity of water units available to the group using the TABLE OF AVAILABLE WATER QUANTITY, which you have for reference. This payoff table shows you how the available water quantity is calculated based upon the size of the public fund, from your contribution and those of the other 4 players in your group.

Once we have recorded your contribution decisions and calculated the quantity of available water, we will write that quantity onto your Decision Form in Column B.

So, for example, if everyone were to contribute 2 units to the public fund and kept 8 units for themselves, no water would be available to be distributed to the group. As a result, everyone would end up with 8 units at the end of the round.

In another example, if everyone were to invest 10 units into the public fund, 100 units of water would be available to be distributed to the group.

Keep in mind that decisions are private, and everyone can decide how much they want to invest into the public fund.

Once the total water quantity has been written onto your decision form, each individual in your group will take turns in deciding how much water to extract from the irrigation system. In this experiment, everyone has the same size of land to be irrigated. The amount of money that you will earn is directly dependent upon the amount of water you take from the system.

After you signed in today, you drew a random card labeled with your group number and a letter, A, B, C, D, or E. That card determined your position within your group.

Your group will take turns in deciding how much water to take for irrigating their land. These turns are determined by the letter of the card you received, which indicates your position in the irrigation system.

This means that first, player A decides how much water to take and writes down that decision onto the Decision Form in Column C. We will record that decision and subtract the taken water from the available water for player B. We will write down the remaining available water quantity and show this number to player B so they can take their turn and decide how much water to take. Each player takes their turn in this manner until player E has written down their decision.

[example: The instructor shows what happens if first player A takes from the pool, then B, etc.]

You may keep track of your earnings each round by filling in Columns D and E on your Decision Form. Column D is the amount of units you kept for yourself instead of investing into the public fund. Column E is your earnings for the round, which is the sum of the water you extracted plus the units you kept in the first decision.

The next round begins with your decisions on the contributions to the public fund as in the previous round.

It is very important to keep in mind that your decisions are absolutely individual. This means that the numbers you write down on the forms are private and you must not show them or discuss them with the other members of the group.

Are there any questions about this? *[MONITOR: pause to resolve questions.]*

Remember that the units you earn depend on your own decisions, and they will become money at the end of this exercise.

Keep in mind that from now on you are not allowed to talk unless I give you permission.

We will have one practice round that will NOT count for your real earnings. It is just an opportunity for you to familiarize yourself with the game. For this practice round, contribute 5 units into the public fund.

We will now record your contribution decisions.

Because everyone contributed 5 units, resulting in 25 units in the public fund, 40 units of water are available to the group.

Now you will take turns in deciding how much water to extract from the system, beginning with player A.

We will now start the actual experiment

[continue with phase.]

Low Variability Phase

It is time to make one change to the game. A new payoff table will be handed out. Now, each round has the possibility of having a low, medium, or high level of rainfall, which will affect the amount of water that the irrigation system can produce. Medium rainfall produces the normal amount of water in the irrigation system as was used in the previous rounds. However, if a round has low rainfall, the amount of water generated for a given quantity of contributions will be lower than in a normal round. If the round has high rainfall, the amount of water generated will be higher than normal.

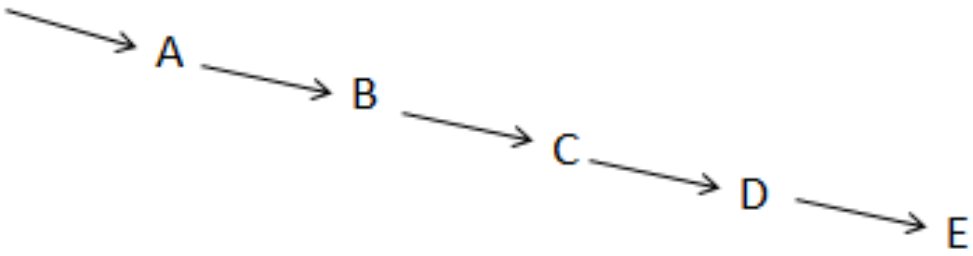
After all contributions into the public fund have recorded, the rainfall level will be announced. To determine whether each of the upcoming rounds will have low, medium, or high rainfall, a 6-sided die was rolled and recorded. If the die was a 1, the round will be a low rainfall. If the die was a 6, the round will be a high rainfall. If the die was a 2 through 5, then the round will be medium rainfall. Therefore, there is a 1 in 6 chance for a round to be low rainfall, 1 in 6 chance for a round to be high rainfall, and a 4 in 6 chance for a normal month. After the rainfall level is announced, the amount of water available to the group will be written onto your decision forms, and the second part of the round will continue.

High Variability Phase

It is time to make another change to the game. We will continue to use the same payoff table as before, but this time, if the die was a 1 or 2, the round will be low rainfall. If it was a 3 or 4, then the round will be medium rainfall, and if the die was a 5 or 6, the round will be high rainfall. Each type of round has an equal chance of 1 in 3 in occurring. After the rainfall level is announced, the amount of water available to the group will be written onto your decision forms, and the second part of the round will continue.

Information provided to Participants: Table of Water availability

Table of available water quantity			
Total units invested in the public fund by all 5 players	Water available		
	Low	Middle	High
0-10	0	0	0
11-15	2	5	8
16-20	8	20	32
21-25	16	40	64
26-30	24	60	96
31-35	30	75	120
36-40	34	85	136
41-45	38	95	152
46-50	40	100	160



Participant Decision Form

Player no:			Time:		
Capital letter:			Date:		
Round	My Decisions				
	A	B	C	D	E
	Contribution	Water for group	Amount extracted	Amount kept = 10-A	Earnings: C+D
Practice					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

INDIVIDUAL SURVEY

Participant ID:

1. How old are you? years

2. Sex ☐ Male ☐ Female

3. What is your major?:

4. Year of study (chose one option)
☐ 1. Freshman
☐ 2. Sophomore
☐ 3. Junior
☐ 4. Senior
☐ 5. Graduate student

5. How satisfied were you with the earnings during the exercises?
☐ 1. I was completely dissatisfied
☐ 2. I was not satisfied
☐ 3. I was somewhat satisfied
☐ 4. I was satisfied
☐ 5. I was very satisfied

6. Did you understand the instructions of the exercises?
☐ 1. I did not understood anything
☐ 2. I did understand only a bit of the instructions
☐ 3. I did understood half of the instructions
☐ 4. I did understood most of the instructions
☐ 5. I did understood everything

7. Have you ever voted in an election (including student governance elections)?
☐ 1. yes
☐ 2. No

8. Global warming is a fact and is mostly caused by emissions from vehicles and industrial facilities.
☐ 1. I completely agree
☐ 2. I somewhat agree
☐ 3. I have no opinion
☐ 4. I somewhat disagree
☐ 5. I completely disagree

SEE ALSO THE BACKSIDE

9. The federal Government should manage the U.S. economy.

☐ 1. I completely agree
☐ 2. I somewhat agree
☐ 3. I have no opinion
☐ 4. I somewhat disagree
☐ 5. I completely disagree

10. Tell me whether the first statement or the second statement comes closer to your own views — even if neither is exactly right.

☐ 1. Most people who want to get ahead can make it if they're willing to work hard

OR

☐ 2. Hard work and determination are no guarantee of success for most people

11. Tell me whether the first statement or the second statement comes closer to your own views — even if neither is exactly right.

☐ 1. The government should do more to help needy Americans, even if it means going deeper into debt

OR

☐ 2. The government today can't afford to do much more to help the needy

12. Aside from weddings and funerals, how often do you attend religious services

☐ 1. More than once a week
☐ 2. Once a week
☐ 3. Once or twice a month
☐ 4. A few times a year
☐ 5. Seldom
☐ 6. Never

13. How important is religion in your life

☐ 1. Very important
☐ 2. Somewhat important
☐ 3. Not too important
☐ 4. Not at all important
☐ 5. Don't know

14. Please provide any comments on the experiment you have.

_____
_____