

Supporting Information

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Trust Game Setting. Overview. In general, a trust game begins with an investor receiving an initial endowment of experimental currency. The game then proceeds through two sequential stages of play. In the first stage, each investor decides how much of the initial endowment to keep and how much to “invest” with a paired (i.e., within-dyad) trustee. Whatever amount the investor sends is tripled in value before the trustee receives it. In the game’s second stage, the trustee decides how much of the amount received to “return” to the investor. No communication is allowed, other than the notification of each subject’s decision to the other subject. Subject anonymity is maintained throughout. Gains from trade result from the tripling of the investment. Thus, a dyad’s gains from trade are maximized when the investor invests the entire endowment.

The anonymous one-shot single-dyad trust game has been conducted with diverse subject pools around the world (1, 2). In sharp contrast to neoclassical economic predictions, investors frequently invest money with trustees, and trustees frequently reciprocate by sharing the gains from trade with investors.

Multiperiod Trust Game. Recently, King-Casas *et al.* use a repeated single-dyad version of the trust game to study the evolution of reputation and trust in two-person economic exchange (3). King-Casas *et al.* argued that repeated transactions are closer to real-life social interactions than a one-shot game, and the game structure allows for (i) development of bidirectional trust, in that both investor and trustee assume risk that investments may not be reciprocated in future interactions, and (ii) reputation formation as both subjects developmental models of one another through their repeated exchange.

Regression analyses in King-Casas *et al.* show that reciprocity (fractional change in amount sent by one subject in response to fractional change in amount sent by the other) significantly predicts trust (amount sent by a subject). In addition, amounts sent in the current period are positively correlated with the level and change in amounts received most recently. Furthermore, as revealed by fMRI neural imaging, trustees begin to anticipate investors’ decisions and develop an “intention to trust” even before they receive investments. Notably, reputation formation occurs even though subjects cannot keep external records, and subjects appear to keep track of at least the last two amounts sent and received. We adopt the 10 period, single-dyad game as our no recordkeeping single-dyad exchange setting, and use this as a baseline condition to investigate the effects of economic complexity and recordkeeping availability.

Multiperiod, Multi-dyad Trust Game. To increase exchange complexity in a natural manner, we extend the repeated game to allow each subject to simultaneously participate in five dyads, retaining the same role (investor or trustee) and matched partners through all 10 periods. Subjects are notified only of the decisions that affect themselves. For example, trustee B1 learns how much investor A1 chose to send to him, but *not* how much investor A1 sent to the other trustees (i.e., B2 through B5). Although the multiple dyads allow each subject to try out several strategies, it also means that they have to identify different partners’ strategies simultaneously and develop appropriate responses. In addition, the multi-dyad exchange setting allows for spillover and feedback effects across subjects that are not possible in the single-dyad exchange setting.

Procedures. Each condition-specific experiment-session included 10 subjects, each of whom was randomly assigned to be either an

investor or a trustee (with the restriction that each session contains 5 investors and 5 trustees). Further, each experiment-session included 10 trading periods. Subjects were not informed of the number of periods to mitigate end game effects, although they were informed via recruiting materials that the experiment would last ≈ 2 h. No experiment-session lasted longer than 90 min.

Subjects received and read written experiment instructions. Subjects then took a quiz to ensure sufficient understanding of experiment instructions. The experiment facilitator checked quiz answers and resolved discrepancies privately before the beginning of the first period. The facilitator collected all instructions and quizzes and ensured subjects had no other materials or writing instruments available. A condition-specific, short-form version of experiment instructions was taped to the wall next to the computer monitor for reference.

Each trading period began with investors deciding how much of 10 units of experiment currency (i.e., *lira*) to invest in the paired trustee(s). In the multi-dyad conditions, investors had 5 separate endowments of 10 *lira* for each of the 5 trustees with whom the investor was paired. All investors’ investment decisions were required before trustees received investment information. Similarly, all trustees’ “return” decisions were required before both player types received feedback information. Investors received feedback information in the form of what each paired-trustee sent. Trustees received feedback information in the form of what was received from each paired-investor (i.e., the tripled investment amount). The next trading period began once all subjects confirmed they were finished reviewing feedback.

At the end of the tenth trading period, subjects completed a short questionnaire containing strategy-oriented and demographic questions. The *lira* learned for all periods was summed and converted to cash at a rate that varies by experimental condition to equalize the maximum possible payout per subject across exchange conditions (0.04 per *lira* in the multi-dyad condition and 0.20 per *lira* in the single-dyad condition). Because each subject in the multi-dyad setting participates in 5 dyads each period, we set the conversion rate in the multi-dyad setting at 1/5 that of the single-dyad setting.

Computer Software and Data Collection. Subjects in a laboratory setting interacted anonymously over a local computer network facilitated by *z-Tree* (Zurich Toolbox for Ready-made Economic Experiments) software (4). The program kept track of all amounts sent and received by each subject in each period and provided designated feedback information. The software also tracked the time at which each subject confirmed investment or return decisions in each period.

In recordkeeping conditions, we provided a text-based electronic notebook to subjects. The notebook is a blank textbox, situated at the right side of the computer screen. The *Textbox* program recorded the contents of the textbox every 5 s for the length of the experiment-session, providing data regarding the timing, content, and extent of recordkeeping engaged in by individual subjects. This program is the only method of personal external recordkeeping available to subjects. Subjects did not have access to paper and pencils, nor could they use computer programs other than *z-Tree* and *Textbox* (the latter available for only those subjects in the recordkeeping condition).

Experiment Instructions. The *SI Appendix* contains the written instructions received by all subjects in the multi-dyad record-

keeping and the single-dyad recordkeeping conditions. Experiment instructions for the no recordkeeping conditions differed only via the lack of notational and pictorial reference to the on-screen textbox. Subject roles were referred to as “A-players” (investors) and “B-players” (trustees) to avoid implications associated with role-descriptions used in the paper.

Description of Subject Demographics, Statistical Tests, and Results.

Subject Demographics. We conducted our experiments at the Center for Interuniversity Research and Analysis on Organization (CIRANO) in Montreal, Canada. CIRANO staff recruited subjects and ran 20 sessions (5 sessions for each experimental condition) during November and December 2005. Two hundred subjects (115 males and 85 females) were recruited by CIRANO from a standard subject pool and remain anonymous to the authors. Demographic data (e.g., subject age, sex, etc.) were collected in a computerized postexperimental questionnaire. The average age of the subjects was 25.5 years and 78% (39%) were 26 years of age or older. One hundred fifteen subjects were graduate students, 82 were undergraduates, and 3 were nonstudents. One hundred sixty-four subjects had been subjects in a prior experiment at CIRANO. The postexperimental questionnaire also elicited qualitative descriptions of subjects’ strategies in making decisions during the experiment.

Statistical Tests. We evaluated differences in performance between the 5 economies with recordkeeping and 5 economies without recordkeeping. For a particular performance index (such as average return in an economy) we ranked the 10 economies and determined at what significance level the null hypotheses of no difference in the ranks was rejected. Mann and Whitney (5) provide the calculation of the exact distribution of ranks under a hypothesis of no difference.

Differences Between Multi-Dyad and Single-Dyad Economies. More subjects made marks on their computer screens in the multi-dyad condition than in the single-dyad condition when recordkeeping was available and this tendency was more pronounced for investors than for trustees (Table S1). Seventy-eight percent of all subjects made marks in the multi-dyad condition compared with 50% in the single-dyad condition. For investors, 88% (48%) made marks in the multi- (single-) dyad condition. Thirty-six subjects initiated typing in the first period of play; 27 of these subjects were in the multi-dyad condition and 9 were in the single-dyad condition (Table S1).

We also measured subjects’ time to decision (see Table S2). Consistent with our expectations, the mean and median times to decision indicate that both investors and trustees took longer to make decisions in the multi-dyad condition than in the single-dyad condition. In general, trustees took longer to make decisions than investors and subjects in the single-dyad condition showed larger percentage declines in decision times than subjects in the multi-dyad condition. These data are consistent with greater cognitive demands in the multi-dyad condition that manifest themselves in actual use of recordkeeping and longer decision times.

The content of records depends on the complexity of the exchange condition (Table S3). Across both economy types, the majority of subjects who kept records included numbers in their records (92% in the multi-dyad condition and 100% in the single-dyad condition). Records in the single-dyad condition were more likely (than those in the multi-dyad condition) to contain qualitative descriptions of past behavior (e.g., “He returns more than I send”), whereas those in the multi-dyad condition were more likely to include some form of judgment (e.g., “2 and 4 are cheap”).

As shown in Fig. S1, the cumulative character count is higher in the multi-dyad condition than in the single-dyad condition. Further, the cumulative character count rose steadily across the

10 periods, regardless of the exchange condition, indicating that recordkeeping was maintained throughout the sessions.

The percentage of maximum investments in the multi-dyad recordkeeping condition exceeded that in the other three conditions in both subperiods (Table S4). The percentage of zero investments was higher in later periods than in earlier periods (Table S4). This finding is consistent with investors excluding trustees after a history of behavior existed. In the multi-dyad condition, the increase in the percentage of zero investments across the subperiods was higher when recordkeeping was possible than when it was not. This pattern was not observed in the single-dyad condition.

The percentage of cases where the trustee split evenly the amount received from the investor (Table S5) or the percentage where the trustee evenly divided the total pie (Table S5) was higher in later periods for all four conditions. In the multi-dyad condition, this effect was most pronounced when recordkeeping was possible, in large part because the number of zero investments increased to a far greater extent. This tendency was not present in the single-dyad exchange condition as the number of positive investments was similar across the subperiods.

Total payouts were highest in the multi-dyad recordkeeping economies and were lowest in the multi-dyad economies without recordkeeping (Table S6). Investors earned a relatively higher mean and median total payout and thus a higher percentage of total earnings than trustees in all conditions (Table S6). In addition, the most equal division of total payouts occurred in the multi-dyad exchange condition with recordkeeping.

Calculation of Image Scores. Table S7 describes the calculation of investor and trustee image scores used in our analyses.

Underlying Data Used to Produce Figures in the Main Paper. The estimates used to produce Figs. 1–4 in the main text are shown in Table S8.

Additional Analyses. In the main paper, we show that recordkeeping is associated with beneficial risk reduction. Our main analysis focuses on investor risk, because as the first mover the investor incurs greater risk. Here, we provide supplemental analyses related to trustee risk.

The risk to a trustee in the trust game arises because an investor may be unwilling to invest large amounts—that is, a trustee earns a positive payoff only when the investment is positive. The results in the main paper suggest that investors discriminate against nonreciprocating trustees in a recordkeeping economy. But, do trustees face greater risk that investors will make overall lower investments in a recordkeeping economy or, even if recordkeeping investors make large investments, are trustees overall disadvantaged in terms of their overall income?

Our evidence suggests these concerns are without merit for our sample. First, there is no evidence to suggest that investors in the recordkeeping economies make lower average investments. On average, investors in the 5 recordkeeping economies invested 56.5% of the maximum amount possible compared with 49.9% in the 5 no recordkeeping economies (Table S6). The difference in mean investment percentage between recordkeeping and no recordkeeping economies is not statistically distinguishable from zero at $P \leq 0.10$.

Total economy-wide investment was also less variable across the 5 recordkeeping economies than the 5 no recordkeeping economies. Our measure of cross-economy investment variability is the coefficient of variation of total economy-wide investment for a given period. The coefficient of variation in economy-wide investment is lower for the recordkeeping economies in both subperiods (Table S9). The mean coefficient of variation (across periods) in total economy-wide investment as a percentage of the maximum possible was 0.269 for the recordkeeping economies and 0.288 for the no recordkeeping economies in periods 1–5. This measure declined for the recordkeeping economies in periods 6–10, but increased for the no recordkeeping

economies. Finally, trustees earned an average income of \$19.05 in the recordkeeping economies compared with \$18.25 in the no recordkeeping economies (Table S6).

Tables S10 and S11 contain additional analyses that accompany those reported in the main paper. Table S10 presents analyses related to subjects' image scores and data and related tests for the image scores of subjects in single-dyad economies. These tests are analogous to those presented for the multi-dyad economies (Figs. 1 and 2 and Table S8. Table S10 also includes similar data and tests related to multi-dyad (single-dyad) economies. However, these data are based on a continuous image score; specifically, investors' image scores are based on the dyad-specific investment amount whereas trustees' image scores are based on dyad-specific return on endowment. Table S11 presents analyses related to correlations between trading partners' behavior in single-dyad economies and are analogous to those presented for the multi-dyad economies (Table 1 and Table S8).

Please note that in a single-dyad session, 10 subjects were used but each individual investor was allowed to transact only with a single trustee, and vice versa. Thus, we have computed a correlation coefficient for each session. (Note that an individual correlation is not calculable for a single person in a given period because $n = 1$.) However, the resultant statistic is not subject to straightforward interpretation. For example, a positive correlation between period t investments and period $t - 1$ trustee image scores in a multi-dyad session arises because each individual investor is making relative comparisons between the various trustees. In this sense, the image score captures differences between trustees that lead to differences in investments decisions. In contrast, because a single-dyad session pairs each investor with a single trustee, the investor makes no relative comparison between trustees. Thus, any cross-correlation that is estimated from the session data for the single-dyad economies is not directly comparable to that obtained from the multi-dyad economies.

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4. Fischbacher U (2007) z-Tree: Zurich Toolbox for Ready-made Economic Experiments. *Exp Econ* 10:171–178.
5. Mann H, Whitney D (1947) On a test of whether one of two random variables is stochastically larger than the other. *The Annals of Mathematical Statistics* 18:50–60.

Table S1. Frequency of subjects' recordkeeping

Recordkeeping performed in any period				
	All Dyads	All Subjects	Investors Only	Trustees Only
Multi-Dyad	121 of 125 (97%)	39 of 50 (78%)	22 of 25 (88%)	17 of 25 (68%)
Single-Dyad	19 of 25 (76%)	25 of 50 (50%)	12 of 25 (48%)	13 of 25 (52%)
Period when recordkeeping begins				
	Period 1	Periods 2–4	Periods \geq 5	No Records Kept
Multi-Dyad Investors	17 (68%)	2 (8%)	3 (12%)	3 (12%)
Multi-Dyad Trustees	10 (40%)	6 (24%)	1 (4%)	8 (32%)
Single-Dyad Investors	2 (8%)	6 (24%)	4 (16%)	13 (52%)
Single-Dyad Trustees	7 (28%)	6 (24%)	0 (0%)	12 (48%)

Table S2. Time to decision

Mean (median) seconds to decision for investors by sub-periods in multi-dyad and single-dyad conditions			
	Period 1–5	Period 6–10	% Change
Multi-Dyad			
Recordkeeping	237.6 (199)	213.7 (168)	–10.1% (–15.6%)
No Recordkeeping	167.8 (137)	90.9 (72)	–45.8% (–47.4%)
Single-Dyad			
Recordkeeping	97.3 (74)	47.2 (23)	–51.5% (–68.9%)
No Recordkeeping	58.3 (43)	26.1 (19)	–55.2% (–55.8%)
Mean (median) seconds to decision for trustees by sub-periods in multi-dyad and single-dyad conditions			
	Period 1–5	Period 6–10	% Change
Multi-Dyad			
Recordkeeping	381.2 (377)	307.0 (260)	–19.5% (–31.0%)
No Recordkeeping	204.6 (184)	190.1 (161)	–7.6% (–12.5%)
Single-Dyad			
Recordkeeping	119.1 (80)	69.4 (38)	–41.7% (–52.5%)
No Recordkeeping	85.9 (71)	39.6 (29)	–53.9% (–59.2%)

Table S3. Record content

	Numbers	Descriptions	Qualitative Judgments	Other	All Recordkeepers
Multi-Dyad	36 (92%)	15 (38%)	11 (28%)	11 (28%)	39 (100%)
Single-Dyad	25 (100%)	16 (64%)	0 (0%)	4 (16%)	25 (100%)
Both Conditions	61 (95%)	31 (48%)	11 (17%)	15 (23%)	64 (100%)

Table S4. Investor trust as reflected in investment decisions

	Multi-Dyad		Single-Dyad	
	RK	No RK	RK	No RK
	Periods 1–5	213 of 625 (34%)	92 of 625 (15%)	37 of 125 (30%)
Periods 6–10	217 of 625 (35%)	118 of 625 (19%)	41 of 125 (33%)	40 of 125 (32%)
All Periods	430 of 1,250 (34%)	210 of 1,250 (17%)	78 of 250 (31%)	76 of 250 (30%)

	Multi-Dyad		Single-Dyad	
	RK	No RK	RK	No RK
	Periods 1–5	61 of 625 (10%)	77 of 625 (12%)	21 of 125 (17%)
Periods 6–10	168 of 625 (27%)	131 of 625 (21%)	24 of 125 (19%)	34 of 125 (27%)
All Periods	229 of 1,250 (18%)	208 of 1,250 (17%)	45 of 250 (18%)	47 of 250 (19%)

Table S5. Trustee reciprocity as reflected in return decisions

	Number of positive investments where trustee splits evenly amount received			
	Multi-Dyad		Single-Dyad	
	RK	No RK	RK	No RK
Periods 1–5	146 of 564 (26%)	53 of 548 (10%)	25 of 104 (24%)	32 of 112 (29%)
Periods 6–10	157 of 457 (34%)	76 of 494 (15%)	29 of 101 (29%)	33 of 91 (36%)
All Periods	303 of 1,021 (30%)	129 of 1,042 (12%)	54 of 205 (26%)	65 of 203 (32%)

	Number of positive investments where trustee splits evenly total lira			
	Multi-Dyad		Single-Dyad	
	RK	No RK	RK	No RK
Periods 1–5	128 of 564 (23%)	39 of 548 (7%)	20 of 104 (19%)	28 of 112 (25%)
Periods 6–10	141 of 457 (31%)	78 of 494 (16%)	27 of 101 (27%)	31 of 91 (34%)
All Periods	269 of 1,021 (26%)	129 of 1,042 (12%)	47 of 205 (23%)	59 of 203 (29%)

Table S6. Total gains from trade and their division between investors and trustees

Percentage increase in total payouts over minimum possible								
	Multi-Dyad		Single-Dyad		RK	No RK	RK	No RK
	RK	No RK	RK	No RK				
No. of Dyads	125		125		25		25	
Mean, %	56.5		49.9		53.1		52.6	
Median, %	54.0		49.0		52.0		52.0	
No. = 100%	15 (12%)		3 (2.4%)		3 (12%)		3 (12%)	
SD, %	31.8		26.8		32.4		29.6	
Canadian Dollar payouts								
	Multi-Dyad				Single-Dyad			
	RK		No RK		RK		No RK	
	Investor	Trustee	Investor	Trustee	Investor	Trustee	Investor	Trustee
Mean	\$23.53	\$19.05	\$21.69	\$18.25	\$23.64	\$17.61	\$23.80	\$19.00
Median	\$24.08	\$19.44	\$21.52	\$18.16	\$20.80	\$16.20	\$23.00	\$17.22
Percentage division of total payout								
	Multi-Dyad				Single-Dyad			
	RK		No RK		RK		No RK	
Mean, %	55.1	44.9	57.2	42.8	60.6	39.4	60.8	39.2
Median, %	53.8	46.2	56.0	44.0	55.9	44.1	54.3	45.7

Table S7. Calculation of investor and trustee image scores

Trustee image score changes for a given period

+2 points for large positive returns

Large positive returns are defined as an amount sent back by the trustee that is $\geq 1/2$ the amount received by the trustee (three times the investment)

+1 point for small positive returns

Small positive returns are defined as an amount sent back by the trustee that exceeds the investor's investment but is less than one-half the amount received by the trustee (three times the investment)

No change (i.e., 0 points) when no trustee decision is made

0 points when the trustee has received nothing from the investor and no decision by the trustee is required

-1 point for small negative returns

Small negative returns are defined as an amount sent back by the trustee that is $\geq 1/2$ of the investor's investment, but is less than the amount invested

-2 points for large negative returns

Large negative returns are defined as an amount sent back by the trustee that is $< 1/2$ of the investor's investment

Investor image score changes for a given period

+2 points for very large investments

Very large investments are those equal to 9 or 10 lira

+1 point for large investments

Large investments are those between 6 and 8 lira

0 points for modest investments

Modest investments are those equal to 5 lira

-1 point for small investments

Small investments are those between 2 and 4 lira

-2 points for very small investments

Very small investments are those equal to 0 or 1 lira

Table S8. Estimates used to construct Figures 1–4

Session Data Used to Compute Mean Session Correlations of Period t Investment with Period t-1 Trustee Image Score (Figure 1A)										
	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10	
RK1	0.669	0.614	0.759	0.564	0.667	0.716	0.736	0.858	0.866	
RK2	0.338	0.257	0.583	0.334	0.424	0.677	0.780	0.849	0.892	
RK3	0.821	0.692	0.745	0.697	0.624	0.724	0.743	0.682	0.726	
RK4	0.291	0.576	0.684	0.679	0.629	0.570	0.710	0.767	0.849	
RK5	0.756	0.801	0.812	0.830	0.858	0.801	0.702	0.804	0.845	
No RK1	0.171	0.394	0.349	0.404	0.640	0.398	0.020	0.115	-0.006	
No RK2	0.602	0.584	0.529	0.312	0.593	0.545	0.564	0.683	0.588	
No RK3	0.633	0.443	0.664	0.423	0.593	0.368	0.413	0.428	0.123	
No RK4	0.407	0.543	0.470	0.642	0.579	0.661	0.394	0.509	0.603	
No RK5	-0.056	0.031	-0.068	0.105	0.022	0.217	-0.047	0.052	0.066	
RK-Mean	0.575	0.588	0.717	0.621	0.640	0.698	0.734	0.792	0.836	
No RK-Mean	0.351	0.399	0.389	0.377	0.485	0.438	0.269	0.357	0.275	

Session Data Used to Compute Mean Session Correlations of Period t Return on Endowment (ROE) with Period t Investor Image Score (Figure 1B)										
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10
RK1	0.010	0.383	0.514	0.379	0.339	0.423	0.601	0.632	0.652	0.672
RK2	0.149	0.493	-0.131	0.420	0.571	0.455	0.628	0.651	0.479	0.466
RK3	0.319	0.287	0.420	0.356	-0.014	0.606	0.618	0.602	0.519	0.256
RK4	0.523	0.087	0.010	0.500	0.336	0.712	0.803	0.656	0.742	0.581
RK5	0.169	0.784	0.718	0.720	0.757	0.613	0.615	0.738	0.774	0.876
No RK1	0.275	0.231	0.237	0.156	0.201	-0.018	0.151	-0.141	0.082	0.033
No RK2	0.301	0.556	0.049	0.096	0.319	0.284	0.128	0.259	0.286	0.404
No RK3	0.056	0.300	0.334	0.513	0.019	0.703	0.239	-0.077	-0.627	0.442
No RK4	-0.028	0.023	0.346	0.426	0.386	0.529	0.770	0.675	0.503	0.595
No RK5	0.118	-0.200	-0.073	-0.301	-0.126	-0.377	-0.161	-0.139	-0.171	-0.124
RK-Mean	0.234	0.407	0.306	0.475	0.398	0.562	0.653	0.656	0.633	0.579
No RK-Mean	0.144	0.182	0.179	0.178	0.160	0.224	0.226	0.115	0.015	0.270

Session Data Used to Compute Mean Session Contemporaneous Correlations of Period t Investor and Trustee Image Scores (Figure 2)										
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10
RK1	-0.111	0.409	0.615	0.682	0.731	0.764	0.753	0.758	0.775	0.813
RK2	0.063	0.222	0.121	0.445	0.476	0.526	0.618	0.688	0.754	0.803
RK3	0.416	0.523	0.542	0.614	0.598	0.674	0.701	0.715	0.760	0.739
RK4	0.658	0.507	0.409	0.614	0.667	0.790	0.824	0.868	0.924	0.938
RK5	0.396	0.770	0.818	0.840	0.819	0.843	0.840	0.846	0.841	0.854
No RK1	0.271	0.196	0.287	0.223	0.277	0.263	0.299	0.277	0.314	0.280
No RK2	0.206	0.355	0.293	0.451	0.477	0.542	0.568	0.559	0.601	0.596
No RK3	0.213	0.391	0.409	0.514	0.422	0.496	0.510	0.493	0.417	0.405
No RK4	-0.018	0.217	0.422	0.503	0.549	0.643	0.709	0.704	0.717	0.735
No RK5	0.034	-0.134	-0.142	-0.142	-0.142	-0.114	-0.052	-0.059	-0.058	-0.039
RK-Mean	0.284	0.486	0.501	0.639	0.658	0.719	0.747	0.775	0.811	0.829
No RK-Mean	0.141	0.205	0.254	0.310	0.316	0.366	0.407	0.395	0.398	0.395

Mean Session Correlation of Period t Return on Endowment (ROE) with Subsequent Investment - RK (Figure 3A)										
	Invest 2	Invest 3	Invest 4	Invest 5	Invest 6	Invest 7	Invest 8	Invest 9	Invest 10	
ROE 1	0.597	0.463	0.379	0.282	0.260	0.262	0.253	0.306	0.349	
ROE 2		0.515	0.529	0.501	0.404	0.415	0.453	0.562	0.592	
ROE 3			0.618	0.506	0.391	0.421	0.438	0.498	0.499	
ROE 4				0.516	0.500	0.481	0.484	0.528	0.523	
ROE 5					0.600	0.575	0.516	0.496	0.473	
ROE 6						0.635	0.628	0.615	0.619	
ROE 7							0.782	0.765	0.730	
ROE 8								0.756	0.758	
ROE 9									0.777	

Mean Session Correlation of Period t Return on Endowment (ROE) with Subsequent Investment - No RK (Figure 3B)										
	Invest 2	Invest 3	Invest 4	Invest 5	Invest 6	Invest 7	Invest 8	Invest 9	Invest 10	
ROE 1	0.396	0.394	0.302	0.293	0.336	0.334	0.197	0.066	0.044	
ROE 2		0.402	0.199	0.245	0.297	0.312	0.179	0.146	0.105	
ROE 3			0.438	0.341	0.395	0.413	0.343	0.237	0.172	
ROE 4				0.390	0.306	0.300	0.219	0.157	0.073	
ROE 5					0.390	0.317	0.188	0.102	0.006	
ROE 6						0.328	0.213	0.223	0.126	
ROE 7							0.262	0.282	0.210	
ROE 8								0.460	0.247	
ROE 9									0.339	

Mean Session Correlation of Period t Investment with Subsequent Return on Endowment (ROE) - RK (Figure 3C)										
	ROE 1	ROE 2	ROE 3	ROE 4	ROE 5	ROE 6	ROE 7	ROE 8	ROE 9	ROE 10
Invest 1	0.225	0.277	0.219	0.211	0.221	0.280	0.333	0.344	0.339	0.249
Invest 2		0.427	0.194	0.311	0.282	0.385	0.356	0.389	0.343	0.260
Invest 3			0.426	0.422	0.331	0.441	0.420	0.435	0.469	0.374
Invest 4				0.576	0.377	0.476	0.541	0.575	0.533	0.447
Invest 5					0.375	0.460	0.470	0.485	0.455	0.404

Invest 6	0.583	0.670	0.520	0.464	0.452
Invest 7		0.695	0.639	0.525	0.494
Invest 8			0.669	0.607	0.503
Invest 9				0.695	0.617
Invest 10					0.635

Mean Session Correlation of Period t Investment with Subsequent Return on Endowment (ROE) - No RK (Figure 3D)

	ROE 1	ROE 2	ROE 3	ROE 4	ROE 5	ROE 6	ROE 7	ROE 8	ROE 9	ROE 10
Invest 1	0.154	0.135	0.059	0.026	-0.070	0.056	-0.027	-0.005	-0.098	-0.047
Invest 2		0.216	0.176	0.055	0.046	0.174	0.074	-0.040	-0.031	0.089
Invest 3			0.202	0.233	0.152	0.131	0.123	0.021	0.001	0.122
Invest 4				0.149	0.279	0.184	0.273	0.067	-0.026	0.181
Invest 5					0.168	0.225	0.194	0.129	0.031	0.157
Invest 6						0.126	0.207	0.139	-0.079	0.186
Invest 7							0.187	0.128	0.103	0.271
Invest 8								0.089	0.002	0.179
Invest 9									0.033	0.370
Invest 10										0.219

Session Data Used to Compute Mean Session Correlations Between Period 10 Investment with Past Return on Endowment (ROE) (Figure 3E)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9
RK1	0.677	0.710	0.578	0.633	0.315	0.450	0.842	0.880	0.790
RK2	0.565	0.673	0.074	0.274	0.650	0.715	0.844	0.793	0.642
RK3	0.210	0.401	0.550	0.420	0.113	0.492	0.561	0.632	0.671
RK4	-0.197	0.574	0.612	0.591	0.453	0.742	0.750	0.735	0.896
RK5	0.489	0.603	0.681	0.695	0.833	0.697	0.651	0.749	0.888
No RK1	-0.371	-0.278	-0.413	-0.374	-0.507	0.047	-0.084	0.529	0.603
No RK2	0.153	0.051	0.484	0.214	0.302	0.318	0.225	0.242	0.494
No RK3	0.154	0.271	0.296	0.141	-0.232	0.187	0.420	-0.147	0.138
No RK4	0.225	0.437	0.453	0.455	0.540	0.439	0.641	0.610	0.431
No RK5	0.058	0.044	0.041	-0.072	-0.074	-0.363	-0.153	-0.000	0.030
RK-Mean	0.349	0.592	0.499	0.523	0.473	0.619	0.730	0.758	0.777
No RK-Mean	0.044	0.105	0.172	0.073	0.006	0.126	0.220	0.247	0.339

Session Data Used to Compute Mean Session Correlations of Period 10 Return on Endowment (ROE) with Past Investment (Figure 3F)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10
RK1	0.184	0.398	0.593	0.604	0.503	0.532	0.523	0.599	0.693	0.749
RK2	-0.038	0.189	0.302	0.371	0.225	0.308	0.556	0.499	0.539	0.493
RK3	0.143	0.072	0.122	0.163	0.167	0.260	0.290	0.300	0.332	0.341
RK4	0.382	-0.100	0.170	0.296	0.336	0.346	0.278	0.426	0.746	0.749
RK5	0.574	0.741	0.681	0.801	0.789	0.813	0.825	0.693	0.773	0.843
No RK1	-0.077	-0.256	-0.133	-0.109	-0.051	-0.140	-0.071	-0.055	0.675	0.226
No RK2	0.152	0.328	0.286	0.296	0.117	0.388	0.435	0.232	0.363	0.417
No RK3	-0.201	0.273	0.446	0.363	0.296	0.468	0.304	0.355	0.348	0.182
No RK4	-0.055	0.189	0.059	0.543	0.534	0.458	0.750	0.439	0.423	0.442
No RK5	-0.054	-0.090	-0.049	-0.190	-0.112	-0.246	-0.060	-0.075	0.039	-0.171
RK-Mean	0.249	0.260	0.374	0.447	0.404	0.452	0.494	0.503	0.617	0.635
No RK-Mean	-0.047	0.089	0.122	0.181	0.157	0.186	0.272	0.179	0.370	0.219

Session Data Used to Compute Mean Session Coefficient of Variation in Investor Rates of Return at Dyad Level (Figure 4)

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10
RK1	0.395	0.269	0.255	0.307	0.466	0.297	0.275	0.225	0.210	0.131
RK2	0.372	0.138	0.315	0.281	0.327	0.338	0.266	0.215	0.224	0.226
RK3	0.531	0.244	0.282	0.230	0.473	0.335	0.120	0.116	0.331	0.320
RK4	0.346	0.532	0.538	0.180	0.225	0.120	0.053	0.286	0.281	0.231
RK5	0.545	0.152	0.180	0.320	0.203	0.211	0.225	0.193	0.134	0.156
No RK1	0.458	0.454	0.312	0.372	0.480	0.266	0.220	0.574	0.209	0.313
No RK2	0.245	0.265	0.214	0.203	0.229	0.282	0.205	0.397	0.267	0.288
No RK3	0.339	0.307	0.264	0.412	0.392	0.401	0.437	0.406	0.548	0.308
No RK4	0.394	0.427	0.554	0.233	0.330	0.198	0.187	0.244	0.382	0.337
No RK5	0.734	0.393	0.394	0.667	0.524	0.384	0.516	0.524	0.498	0.560
RK-Mean	0.438	0.267	0.314	0.263	0.339	0.260	0.188	0.207	0.236	0.213
No RK-Mean	0.434	0.369	0.348	0.378	0.391	0.306	0.313	0.429	0.381	0.361

Table S9. Analysis of trustee risk in exchange

	Periods 1–5		Periods 6–10		Change (+/–)	
	RK	No RK	RK	No RK	RK	No RK
Mean economy-wide investment as % of max possible	60.3	50.8	52.7	48.9	–7.6	–1.9
Mean coefficient of variation of economy-wide total investment as % of maximum possible across all periods	0.269	0.288	0.157	0.351	–.112	+.063

Table S10. Additional Analyses–Image Scores

Mean Session Correlation Between Investors' Period t Investment with Trustees' Period t-1 Discrete Image Score– Single-Dyad Economies										
	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10	
RK1	0.250	-0.246	-0.196	0.354	0.814	0.083	-0.083	0.570	0.684	
RK2	0.994	-0.609	0.631	0.826	0.720	0.840	0.573	0.412	0.738	
RK3	0.818	0.554	-0.480	0.739	0.750	0.831	0.870	0.321	0.876	
RK4	-0.081	0.975	0.653	0.933	0.693	0.808	0.702	0.587	0.856	
RK5	—	0.523	0.442	0.223	0.034	0.416	0.418	0.420	0.445	
No RK1	0.600	0.512	0.612	0.731	0.497	0.708	0.680	0.621	0.665	
No RK2	0.395	0.952	0.996	0.692	0.701	0.993	0.995	0.453	0.950	
No RK3	0.680	0.550	0.632	0.690	0.676	0.564	0.444	0.428	0.643	
No RK4	-0.708	0.135	0.008	0.796	0.850	0.844	0.683	0.962	0.699	
No RK5	0.825	0.859	0.638	0.685	0.773	0.783	0.871	0.782	0.669	
RK-Mean	0.482	0.239	0.210	0.615	0.602	0.596	0.496	0.462	0.720	
No RK-Mean	0.359	0.608	0.577	0.719	0.699	0.779	0.734	0.649	0.725	
	Periods 2–5				Periods 6–10					
Recordkeeping	0.384				0.575					
No Recordkeeping	0.566				0.717					
Mann-Whitney p value (one-tailed)	0.048				0.111					
Mean Session Correlation Between Trustees' Period t Return on Endowment (ROE) with Investors' Period t Discrete Image Score–Single-Dyad Economies										
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10
RK1	-0.923	0.866	0.228	-0.993	0.985	-0.422	-0.976	0.971	-0.221	-0.905
RK2	-0.247	0.864	0.922	-0.985	0.939	0.199	-0.945	0.978	0.867	-0.947
RK3	-0.845	0.650	0.751	-0.720	0.960	-0.593	-0.914	0.920	0.320	-0.686
RK4	-0.968	-0.127	0.000	-0.899	0.983	0.247	-0.798	0.971	0.702	-0.896
RK5	—	—	1.000	-1.000	0.688	0.076	-0.907	0.728	0.319	-0.773
No RK1	-0.980	0.942	0.889	-0.995	0.968	0.320	-0.916	0.983	0.688	-0.933
No RK2	-0.978	0.931	0.623	-0.965	0.854	0.199	-0.956	0.979	0.846	-0.936
No RK3	-0.506	0.914	0.426	-0.886	0.888	0.122	-0.887	0.952	0.579	-0.779
No RK4	-0.703	0.371	-0.094	-0.815	0.857	0.005	-0.301	0.936	0.954	-0.031
No RK5	-0.311	0.650	-0.007	-0.978	0.837	0.280	-0.851	0.840	0.383	-0.889
RK-Mean	-0.746	0.563	0.580	-0.919	0.911	-0.099	-0.908	0.914	0.397	-0.841
No RK-Mean	-0.696	0.762	0.367	-0.928	0.881	0.185	-0.782	0.938	0.690	-0.714
	Periods 1–5					Periods 6–10				
Recordkeeping	0.093					0.107				
No Recordkeeping	0.077					0.064				
Mann-Whitney p value (one-tailed)	0.421					0.210				
Mean Contemporaneous Correlation Between Investors' and Trustees' Discrete Image Scores–Single-Dyad Economies										
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10
RK1	-0.602	-0.492	-0.843	-0.799	-0.613	-0.328	-0.372	-0.435	-0.159	-0.194
RK2	0.033	0.608	-0.103	0.538	0.620	0.775	0.632	0.766	0.842	0.887
RK3	-0.329	0.093	0.081	-0.038	0.270	0.518	0.547	0.684	0.821	0.837
RK4	-0.395	-0.245	0.692	0.851	0.971	0.988	0.976	0.948	0.927	0.946
RK5	—	—	0.492	0.562	0.236	0.204	0.271	0.301	0.353	0.347
No RK1	0.739	0.674	0.824	0.637	0.648	0.638	0.635	0.630	0.635	0.643
No RK2	0.395	0.395	0.592	0.786	0.844	0.817	0.874	0.909	0.884	0.906
No RK3	0.389	0.415	0.616	0.681	0.734	0.785	0.808	0.789	0.740	0.761
No RK4	-0.774	-0.845	-0.412	-0.359	-0.197	0.166	0.451	0.513	0.689	0.727
No RK5	0.559	0.834	0.971	0.887	0.857	0.943	0.966	0.967	0.954	0.959
RK-Mean	-0.323	-0.009	0.064	0.223	0.297	0.431	0.411	0.453	0.557	0.565
No RK-Mean	0.262	0.295	0.518	0.526	0.577	0.670	0.747	0.761	0.781	0.800
	Periods 1–5					Periods 6–10				
Recordkeeping	0.069					0.483				
No Recordkeeping	0.436					0.752				
Mann-Whitney p-value (one-tailed)	0.026					0.165				
Mean Session Correlation Between Investors' Period t Investment with Trustees' Period t-1 Continuous Image Score– Multi-Dyad Economies										
	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10	
RK1	0.660	0.605	0.721	0.464	0.562	0.610	0.672	0.765	0.727	
RK2	0.309	0.265	0.493	0.380	0.425	0.676	0.750	0.798	0.885	
RK3	0.790	0.537	0.589	0.577	0.481	0.572	0.599	0.489	0.561	
RK4	0.358	0.662	0.680	0.643	0.516	0.486	0.583	0.673	0.720	
RK5	0.705	0.680	0.649	0.662	0.632	0.634	0.462	0.586	0.658	
No RK1	0.052	0.229	0.189	0.291	0.306	0.295	-0.074	-0.287	-0.397	

Table S11. Additional Analyses - Single-Dyad Economies Correlations

Mean Session Correlation of Period t Return on Endowment (ROE) with Subsequent Investment–RK–Single-Dyad Economies									
	Invest 2	Invest 3	Invest 4	Invest 5	Invest 6	Invest 7	Invest 8	Invest 9	Invest 10
ROE 1	0.345	0.208	0.208	0.602	0.562	0.548	0.547	0.458	0.662
ROE 2		—	—	—	—	—	—	—	—
ROE 3			0.466	0.476	0.453	0.362	0.410	0.342	0.463
ROE 4				0.580	0.540	0.395	0.383	0.312	0.528
ROE 5					0.593	0.515	0.572	0.412	0.596
ROE 6						0.648	0.659	0.333	0.547
ROE 7							0.191	0.355	0.446
ROE 8								0.379	0.514
ROE 9									0.732

Mean Session Correlation of Period t Return on Endowment (ROE) with Subsequent Investment–No RK–Single-Dyad Economies									
	Invest 2	Invest 3	Invest 4	Invest 5	Invest 6	Invest 7	Invest 8	Invest 9	Invest 10
ROE 1	0.665	0.566	0.566	0.557	0.357	0.525	0.425	0.407	0.541
ROE 2		0.698	0.702	0.495	0.479	0.639	0.562	0.425	0.528
ROE 3			0.529	0.539	0.580	0.511	0.606	0.260	0.494
ROE 4				0.680	0.615	0.718	0.588	0.447	0.577
ROE 5					0.619	0.645	0.570	0.575	0.436
ROE 6						0.691	0.598	0.620	0.698
ROE 7							0.764	0.732	0.800
ROE 8								0.740	0.698
ROE 9									0.689

Mean Session Correlation of Period t Investment with Subsequent Return on Endowment (ROE)–RK–Single-Dyad Economies										
	ROE 1	ROE 2	ROE 3	ROE 4	ROE 5	ROE 6	ROE 7	ROE 8	ROE 9	ROE 10
Invest 1	—	—	—	—	—	—	—	—	—	—
Invest 2		—	—	—	—	—	—	—	—	—
Invest 3			0.080	0.509	0.230	0.242	0.153	0.389	0.386	0.316
Invest 4				0.338	0.408	0.441	−0.012	0.142	0.292	0.259
Invest 5					0.588	0.592	0.248	0.367	0.722	0.635
Invest 6						0.591	0.239	0.373	0.702	0.601
Invest 7							0.237	0.257	0.590	0.432
Invest 8								0.308	0.634	0.491
Invest 9									0.513	0.656
Invest 10										0.816

Mean Session Correlation of Period t Investment with Subsequent Return on Endowment (ROE)–No RK–Single-Dyad Economies										
	ROE 1	ROE 2	ROE 3	ROE 4	ROE 5	ROE 6	ROE 7	ROE 8	ROE 9	ROE 10
Invest 1	0.321	0.293	0.510	0.332	0.460	0.226	0.200	0.253	0.065	0.234
Invest 2		0.367	0.688	0.404	0.287	0.118	0.244	0.268	−0.012	0.356
Invest 3			0.513	0.539	0.345	0.337	0.509	0.388	0.271	0.583
Invest 4				0.537	0.192	0.270	0.279	0.202	0.134	0.422
Invest 5					0.689	0.460	0.516	0.566	0.323	0.403
Invest 6						0.747	0.705	0.810	0.754	0.703
Invest 7							0.612	0.667	0.625	0.581
Invest 8								0.717	0.581	0.688
Invest 9									0.730	0.780
Invest 10										0.947

Session Data Used to Compute Mean Session Correlations Between Period 10 Investment with Past Return on Endowment (ROE)–Single-Dyad Economies

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9
RK1	0.615	n/a	0.514	0.086	0.560	0.300	0.086	0.086	0.729
RK2	0.861	0.145	0.198	0.756	0.719	0.771	0.331	0.803	0.781
RK3	0.457	0.752	0.410	0.119	0.749	0.737	0.770	0.506	0.823
RK4	0.861	0.912	0.929	0.882	0.953	0.908	0.921	0.938	0.968
RK5	0.516	0.611	0.264	0.798	−0.001	0.020	0.121	0.236	0.360
No RK1	0.592	0.482	0.295	0.327	0.727	0.783	0.920	0.920	0.808
No RK2	0.200	0.802	0.831	0.919	0.200	0.987	0.919	0.919	0.791
No RK3	0.169	0.241	0.501	0.274	0.234	0.265	0.721	0.721	0.672
No RK4	0.867	0.789	0.192	0.687	0.868	0.941	0.580	0.580	0.694
No RK5	0.879	0.326	0.648	0.676	0.154	0.514	0.353	0.353	0.480
RK-Mean	0.662	0.605	0.463	0.528	0.596	0.547	0.446	0.514	0.732
No RK-Mean	0.541	0.528	0.494	0.577	0.436	0.698	0.800	0.698	0.689

Session Data Used to Compute Mean Session Correlations of Period 10 Return on Endowment (ROE) with Past Investment–Single-Dyad Economies

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10
RK1	−0.601	0.086	−0.338	−0.343	0.772	0.772	−0.343	−0.343	0.809	0.912
RK2	−0.082	0.924	0.437	0.971	0.985	0.983	0.779	0.945	0.620	0.846
RK3	−0.396	0.472	0.206	−0.547	0.349	0.384	0.414	0.581	0.630	0.938
RK4	−0.264	0.136	0.797	0.780	0.908	0.779	0.835	0.796	0.746	0.909
RK5	—	—	0.477	0.431	0.160	0.089	0.477	0.477	0.477	0.477
No RK1	0.192	0.314	0.425	0.210	0.374	0.918	0.453	0.511	0.941	0.941
No RK2	0.250	0.250	0.575	0.612	0.408	0.818	0.612	0.612	0.875	0.875
No RK3	0.384	0.495	0.439	0.299	0.280	0.468	0.415	0.980	0.983	0.987
No RK4	−0.024	0.012	0.798	0.602	0.436	0.727	0.887	0.781	0.702	0.993
No RK5	0.369	0.708	0.680	0.387	0.519	0.585	0.536	0.554	0.400	0.940
RK-Mean	−0.336	0.405	0.316	0.259	0.635	0.601	0.432	0.491	0.656	0.816
No RK-Mean	0.234	0.356	0.583	0.422	0.403	0.703	0.581	0.688	0.780	0.947

Null values represent undefined correlations given zero variance for one or more subjects. These values are not included in means or related tests. These limited occurrences are found in single-dyad economies.
Includes statistical test results not included elsewhere.

Other Supporting Information Files

[SI Appendix](#)