

Trust Game

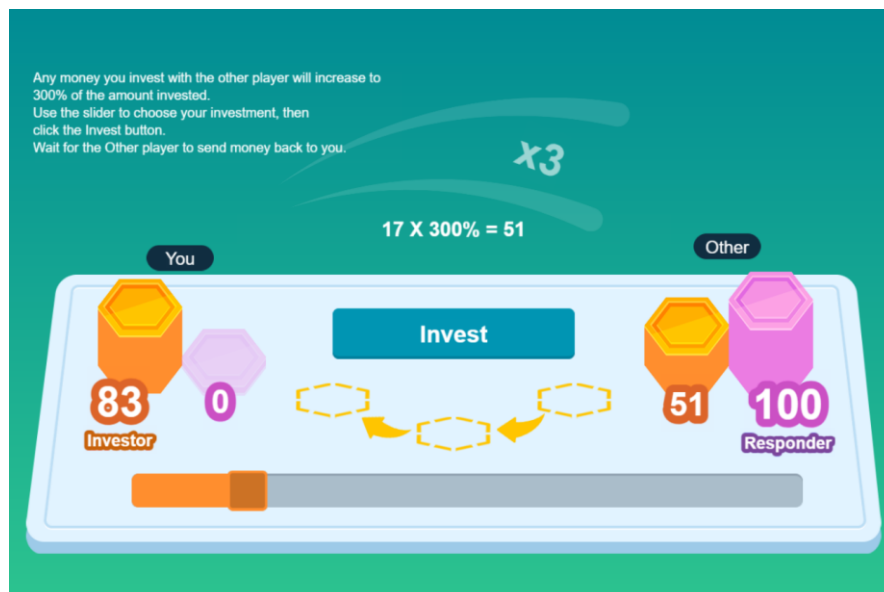
Teaching Note | MobLab x Harvard Business Impact

Primary Topic:	Behavioral Economics, Contract Theory, Organizational Economics
Typical Duration:	Prep: 3-5 min Game: 5-10 min Debrief: 10-15 min
Group Size:	Pairs; scales to any class size
Difficulty Level:	Introductory / Intermediate
Prerequisites:	Basic familiarity with sequential games helpful but not required.

1. Overview & Learning Objectives

Students are paired as an Investor and a Responder. Both start with \$100. The Investor decides how much to send to the Responder — any amount sent is tripled by the system. The Responder then decides how much of the total (their original \$100 plus the tripled investment) to return to the Investor. Both players' final payoffs depend on these two sequential decisions.

The game is a sequential dilemma. Under backward induction, the Responder always returns zero, so the rational Investor sends nothing — and the surplus from the tripling is never created. Yet in most sessions, Investors do send money and many Responders return more than the original investment. This trust and trustworthiness produces higher joint payoffs than the equilibrium predicts, making the game a vivid demonstration of how social preferences and norms can overcome the limits of formal contracting.



Payoff Example: Both start with \$100. Investor sends \$40 (tripled to \$120 for Responder). Responder returns \$60. Investor earns $\$100 - \$40 + \$60 = \120 . Responder earns $\$100 + \$120 - \$60 = \160 . Both are better off than the zero-investment equilibrium.

By the end of this simulation, students will be able to:

- Trust and Trustworthiness: Distinguish between trust (the Investor's willingness to risk money) and trustworthiness (the Responder's willingness to return more than required), and explain both as departures from the Nash equilibrium prediction.
- Backward Induction: Derive the subgame-perfect Nash equilibrium (invest zero, return zero) and explain why it leaves joint gains on the table.
- Positive Reciprocity: Identify positive reciprocity — returning kindness for kindness — as a distinct social preference from altruism, using the Dictator-Trust comparison to isolate it.
- Implications for Contracts: Evaluate how trust and reciprocity enable economic relationships that formal contracts cannot fully specify or enforce.

2. Setup & Configuration

Configuration	Recommended Setting
Periods	1 (one-shot). Use Periods > 1 or Ending Probability < 100% to introduce strategic reputation incentives in a later session.
Endowment	Default \$100 each. Keep values large enough that integer choices are meaningful.
Multiplier	Default 3x (300%). Ensures investment increases total surplus; higher multiplier = larger gains from trust.
Robot Players	Two strategies available: Nash Equilibrium (invest/return zero) or Reciprocal (trust-based, adjusts based on returns).

3. Instructions & Debrief

Pre-Game

Explain the sequence clearly: the Investor moves first and sends any amount from \$0-\$100; whatever is sent is tripled and added to the Responder's account; the Responder then decides how much of their total balance to return. Emphasize that there is no contract — the Responder is not obligated to return anything.

Instructor Tip: Ask students to make their decisions before thinking too hard about the 'right' answer. Authentic first reactions — Investors who trust fully, Responders who return nothing, or vice versa — generate the best debrief conversations.

Discussion Questions

- Investors: how much did you send, and what were you thinking? Were you trusting your partner, or were you just curious what would happen?
- Responders: when you saw how much was sent to you, how did that affect your decision about how much to return? Did a larger investment make you feel more obligated?
- The equilibrium prediction is that the Responder returns nothing and therefore the Investor sends nothing. Did that happen? What allowed some pairs to do better?
- Investors who sent more tended to get more back. Why? What does this tell us about how trust signals work in real relationships?

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- Think of a business relationship where trust matters but contracts are incomplete — an employment relationship, a supplier agreement, a partnership. How do the dynamics of this game map onto that situation?

Theoretical Connections

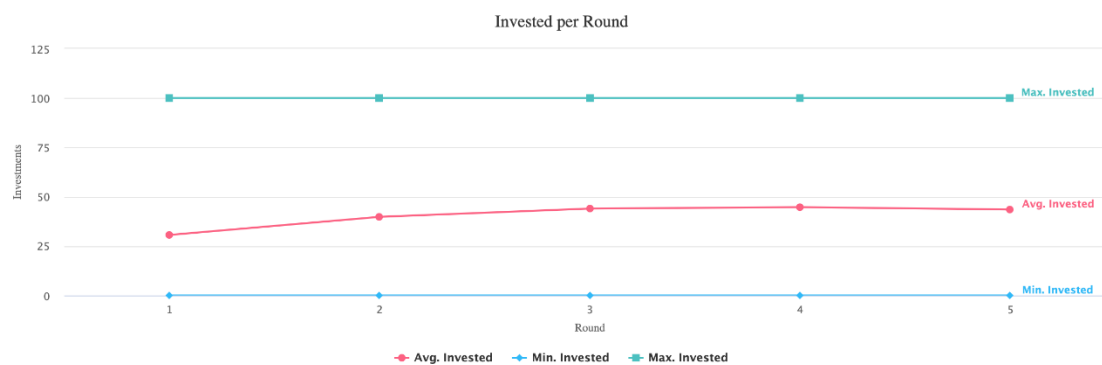
- Subgame-Perfect Nash Equilibrium: The Responder's dominant action is to return zero, which makes investment irrational for the Investor. Backward induction unravels the cooperation that would benefit both parties.
- Positive Reciprocity: Responders who return more when given more are exhibiting positive reciprocity — they respond to trusting behavior with trustworthy behavior. This is distinct from altruism (giving regardless of what was sent) and is isolable by comparing Trust returns to Dictator offers under the same endowment conditions.
- Trust as a Social Technology: Societies with higher levels of generalized trust exhibit higher economic growth (Putnam, 1993; Knack & Keefer, 1997). The game makes this abstract claim tangible: trust creates surplus that couldn't exist otherwise.
- Incomplete Contracts: When it is impossible or too costly to write a complete contract specifying all contingencies, economic relationships depend on goodwill and norms. The Trust game is the canonical laboratory model of this problem.

4. Results & Extensions

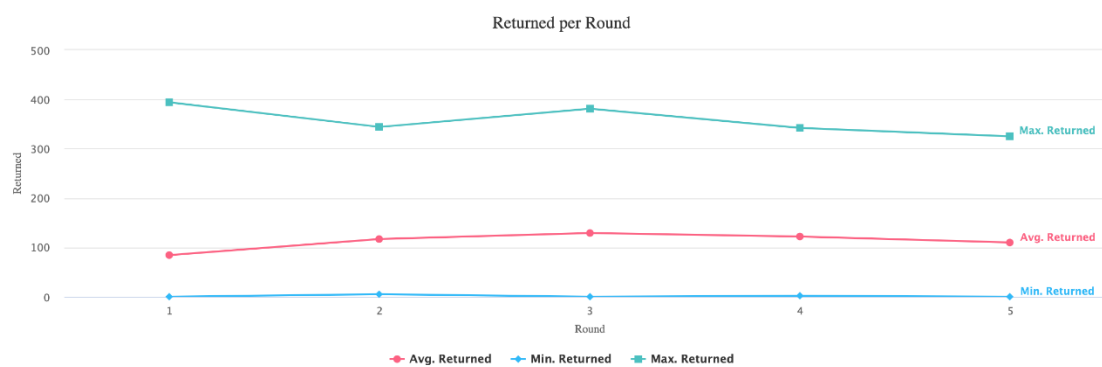
Reading the Results

The aggregate results present several graphs. The first graph below shows the average amount invested and returned, as well as the maximum and minimum values. The second graph shows the average investment and percent of profits returned for each round grouped by whether the initial investment was below ("Low Group") or above ("High Group") the median investment across all groups. These graphs serve to illustrate any patterns of trust building over multiple rounds which are potentially obscured by merely observing the averages

▲ Invested per Round



▲ Returned per Round

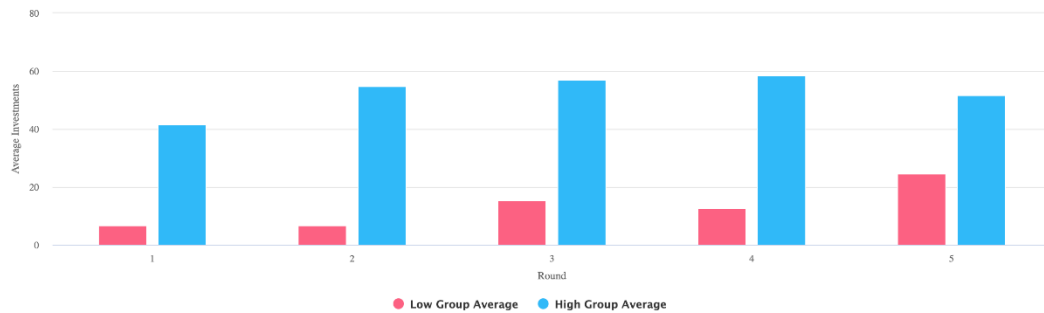


Investments and Percent of Profits Returned per Round

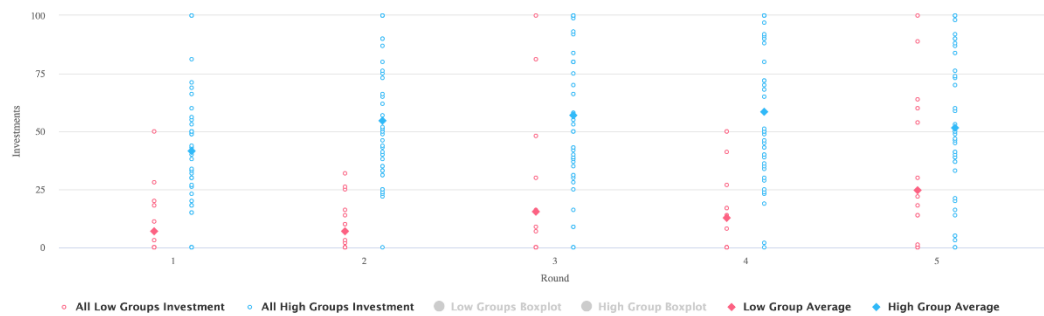
Comments

- We calculate the average investment across rounds for each group and categorize all groups into the High Group and the Low Group. A group is in the Low/High Group if its average investment is lower/higher than the median.
- Participants can return more than 100% if they add their endowment.
- The graphs display all returns greater than 150% as 150% of the investment.
- We drop all cases of 0 investment from the Average Percent of Profits Returned Chart.

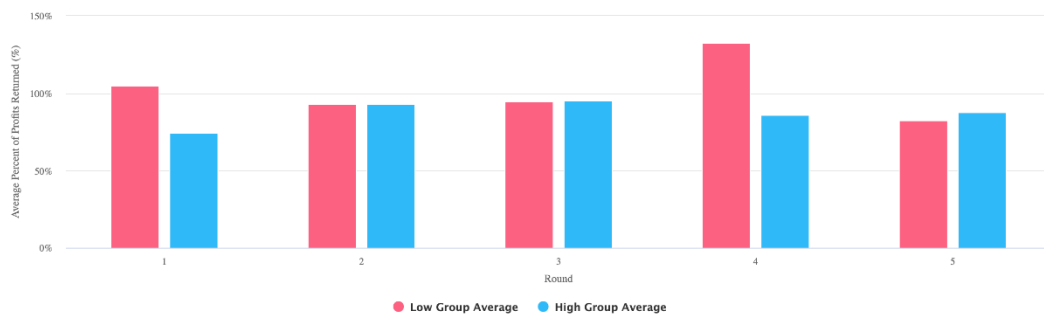
Average Investments per Round



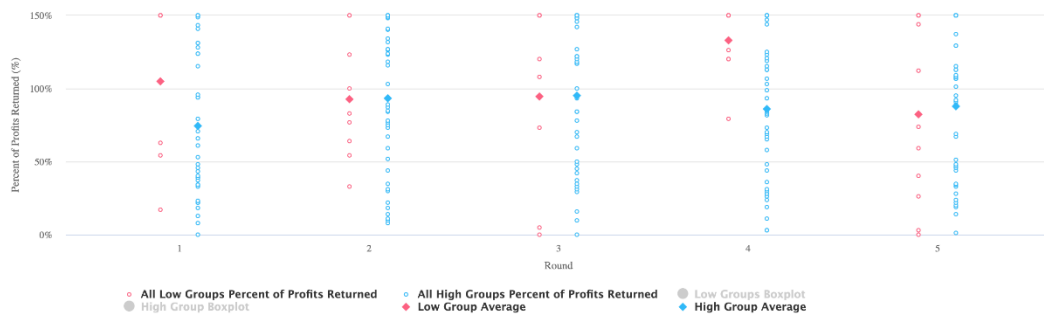
Investments per Round



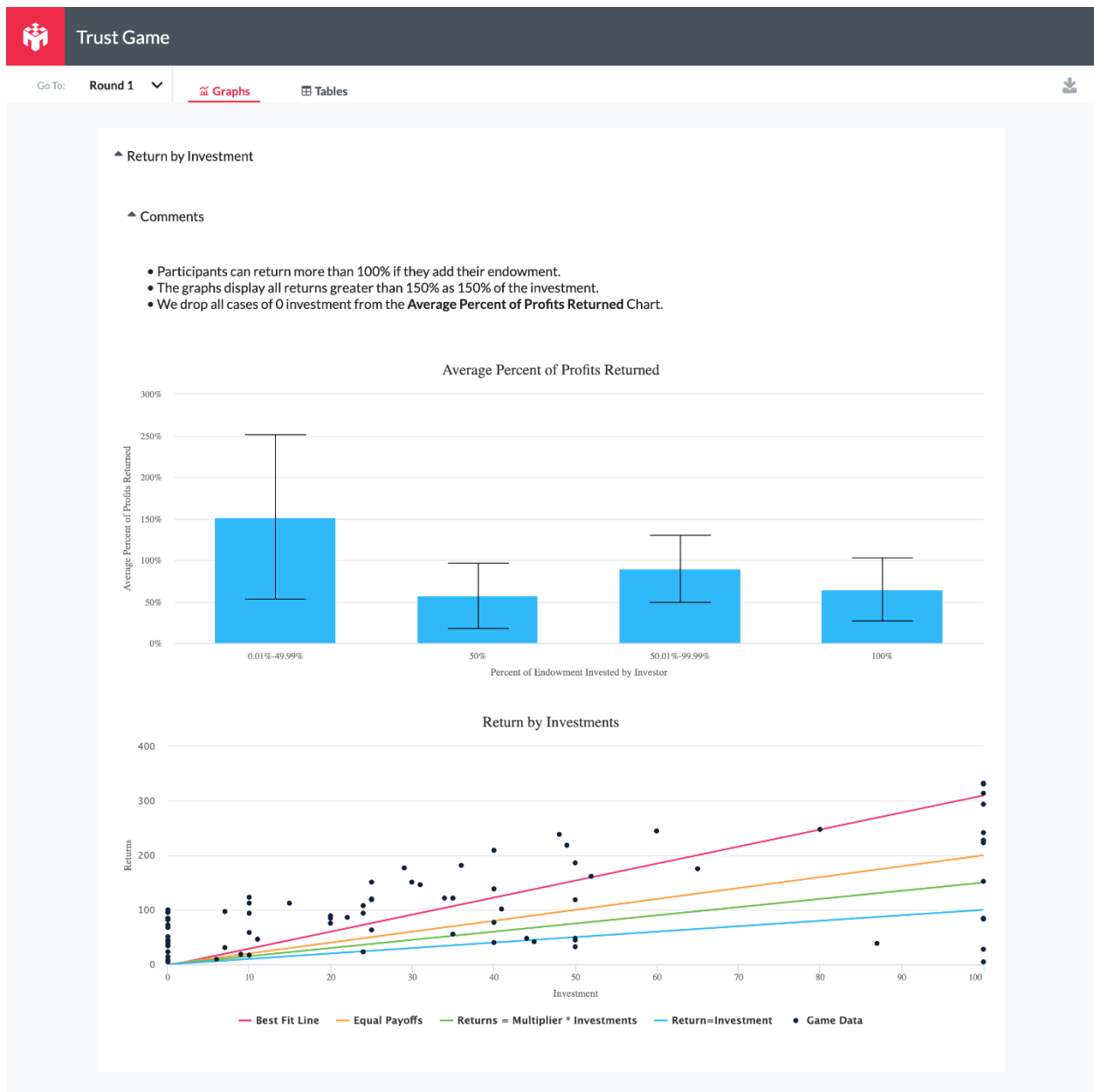
Average Percent of Profits Returned per Round



Percent of Profits Returned per Round



The Graphs tab shows average amounts invested and returned, with min/max ranges. The Return by Investment scatter plot is particularly powerful: plot amount invested on the x-axis and amount returned on the y-axis. The blue line shows break-even returns (Investor gets back what was sent); observations above this line represent ex-post profitable investments. The orange equal-payoff line and green full-return line help students interpret the distribution of Responder generosity.



Key Variations

- Pair with Dictator: Set Player 2 Endowment to \$0 and compare returns to Dictator offers. The gap isolates positive reciprocity from pure altruism.
- Repeated Interaction: Add rounds or use Ending Probability < 100% to give Responders strategic incentives to return more, disentangling reputation from genuine reciprocity.
- High vs. Low Trust Groups: Compare results across groups or sessions. Groups with higher average investment tend to have higher average returns — a mini-demonstration of trust equilibria.

References

- Berg, J., Dickhaut, J., & McCabe, K. (1995). Trust, Reciprocity, and Social History. *Games and Economic Behavior*, 10(1), 122-142. The original Trust game paper.
 - Fehr, E. & Gächter, S. (2000). Cooperation and Punishment in Public Goods Experiments. *American Economic Review*, 90(4), 980-994.
 - Knack, S. & Keefer, P. (1997). Does Social Capital Have an Economic Payoff? *Quarterly Journal of Economics*, 112(4), 1251-1288.
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