Experimental Economics

Trust game and reciprocity

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Outline for today

- Your trust game experiment

- Lab report 4

- Dictator and ultimatum games

- Political conflict game

Trust game

Rules

- Player 1 (trustor) is equipped with initial endowment $x = \$4$

- Trustor transfers share $s \in [0,1]$ of x to player 2 (trustee)

- The transferred amount $s \times x$ is multiplied by factor $m > 1$

- Trustee decides what share to keep and transfers the remainder r back to trustor

Trust game

Payoffs

- Payoff of trustor $\pi_1 = (1 - s)x + (sxm)r$

- Payoff of trustee $\pi_2 = (sxm)(1 - r)$

- What is the total surplus? → independent of r

- Total surplus $\pi = \pi_1 + \pi_2 = (1 - s)x + sxm$

- What initial share s maximizes total surplus?

➢ $\pi_{max} = xm$ if $s = 1$

- Is this realistic?

Trust game

Real-world examples

- Online marketplaces (e.g., eBay, Airbnb)
    - Buyers pay in advance, trusting sellers will deliver quality goods/services
    - Hosts trust guests to respect their property

- Banking and microfinance
    - Lenders trust borrowers to repay loans without immediate enforcement mechanisms

- Employer-employee relationship
    - Employers invest in employee training, trusting employees will not leave for competitors
    - Employees work hard, trusting employers will provide career growth and not fire them

- International trade and diplomacy
    - Countries engage in trade agreements, trusting partners will honor commitment
    - **Peace treaties** rely on trust that each side will uphold its promises
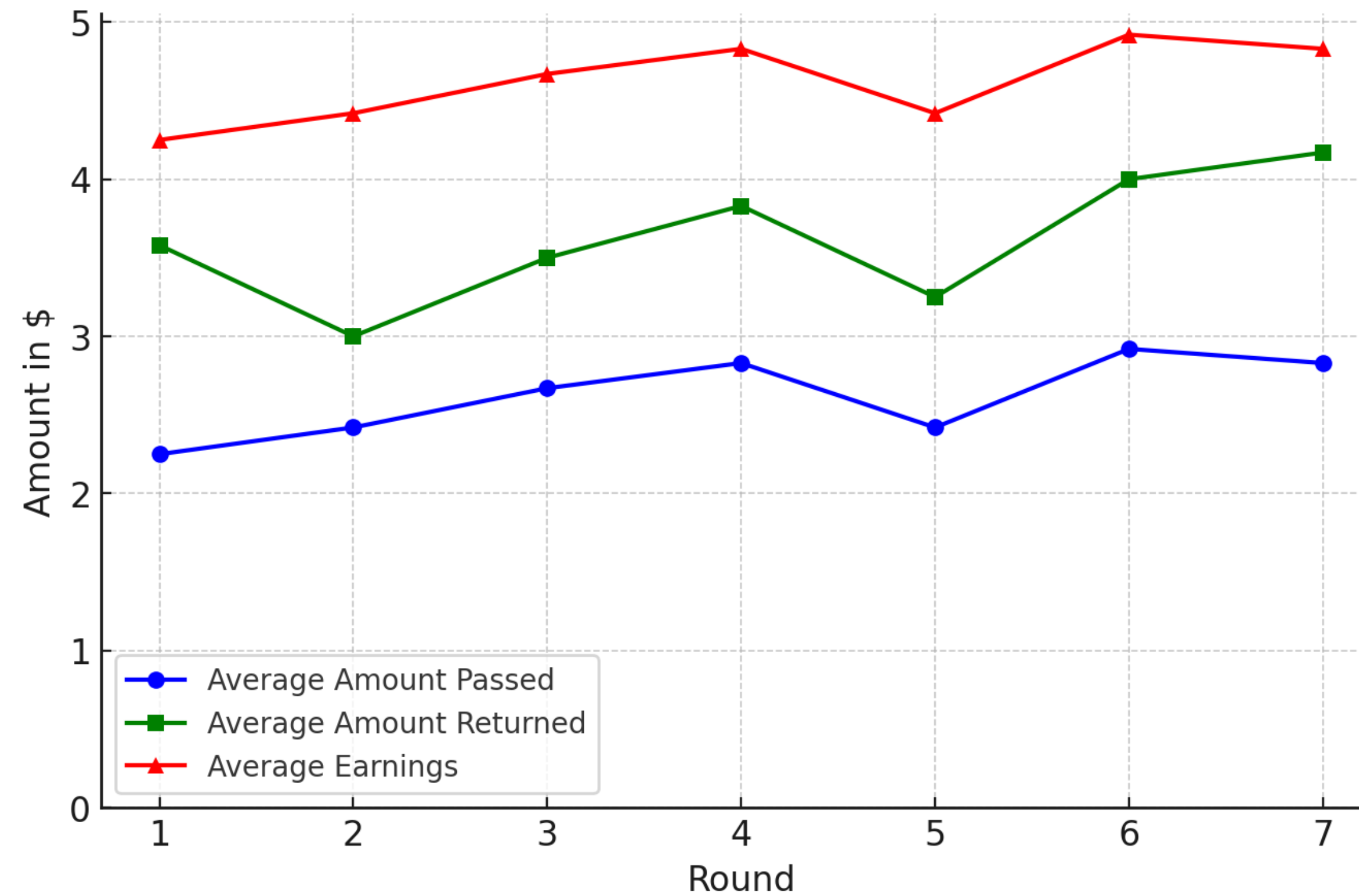
Lab report

Q1: What is the equilibrium solution in the trust game?

- ## What should player 2 do if she is selfish and rational?

  - Best strategy is what maximizes her payoff given the strategy (i.e., transfer) of the other player

  - More specifically, given any transfer, what strategy maximizes her payoff?

  - ➢ Standard assumption in economic theory: homo economicus keeps everything for herself

- ## Given that, what should player 1 do?

  - Anticipating that trustee is rational and returns 0, trustor ought to send 0 in the first place

- ## Is this optimal in terms of surplus creation?

  - Players could improve their payoffs if they behaved differently. Which player has critical role?

  - ➢ Trustor – total surplus depends only on initially transferred share s but not on return share r
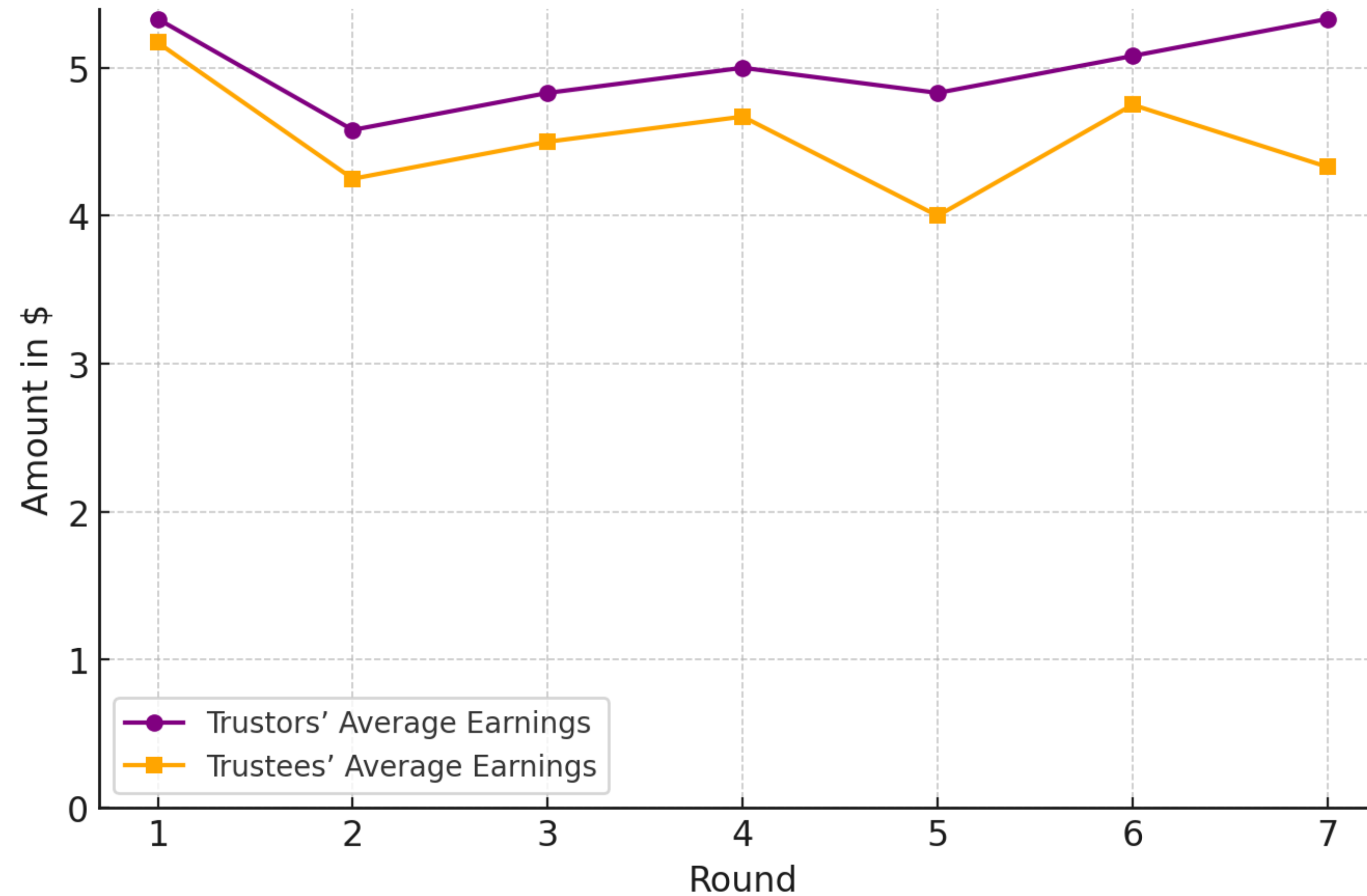
Lab report

Q2

Round	1	2	3	4	5	6	7
Average amount Passed	2.25	2.42	2.67	2.83	2.42	2.92	2.83
Average amount Returned	3.58	3.00	3.50	3.83	3.25	4.00	4.17
Average earnings	4.25	4.42	4.67	4.83	4.42	4.92	4.83

Lab report

Q2

Lab report

Q3: Backward induction

- If you had known before that this experiment finished after 7 rounds, how do you think average amounts would have been affected?

  - Terminal effects

- To solve the *multi-stage* trust game, we can use **backward induction**

  - What is the Nash equilibrium in the last round?

  ➢ Subgame perfect equilibrium. I.e., refinement of NE used in dynamic games with sequential moves. It ensures players' strategies constitute a NE in every subgame of the original game.

Lab report

Q3: Backward induction

- What does second mover in last round?

➢ Given that, what does first mover in last round?

➢ Given that, what does second mover in second-to-last round?

➢ …

Lab report

Q4: Is the equilibrium different depending on the matching?

- **Theoretically** it is not relevant whether we are playing random matching (*one-shot game*) or fixed matching (*repeated game*).

➢ In a fixed matching treatment, the game is repeated *finitely*. Therefore, in the last period the players play the NE. In the period before the last one also, and, with this reasoning, they do so in all periods.

- **In practice**, however, we would expect some form of coordination to increase payoffs. In fact, in our experiment, we see that almost nobody ever played the NE strategy regardless of being trustor or trustee.

Other-regarding preferences

Why do trustor and trustee send money contrary to the theoretical prediction?

- We saw it worked to increase own payoffs.

- There might be further explanations:

- **Inequality aversion:** Individuals don't like to earn more or less than others. Most people dislike inequality to their disadvantage somewhat more than to their advantage, but experimental studies typically observe inequality in both directions. → *applies to trustor and trustee*

- **Reciprocity preferences:** The trustee rewards the trustor's good intentions. The trustee knows that the trustor does not have to send any money, and if she does, then the trustee believes that the trustor has good intentions, and so she behaves reciprocal. → *applies also to trustor in multi-stage game*

Lab report

Q5: Successful random assignment of the roles in the experiment?

- We can judge the success of the random assignment by comparing the distributions of auxiliary variables across treatments (i.e., roles).

- **T-test**: for continuous or numeric variables (i.e., Age, Patience)

- **Two-sample test of proportions** (Z-test for proportions): for binary variables (i.e., Female, Employed, Voted in election)

- **Chi-square-test:** for categorical variables incl. binary variables

➢ Random assignment was successful

Mean	Age	Female	Employed	Voted in election	Patience
First mover	21.18	.18	.36	.82	8.09
Second mover	20.83	.25	.17	.83	8.08
P-value	0.538	0.692	0.283	0.924	0.986

Lab report

Q6: What is the best predictor for participants' earnings?

- Correlation analysis according to Cohen (1988)
  - r=0.10 → small effect
  - r=0.30 → moderate effect
  - r=0.50 → large effect

- Statistical significance must be tested using the t-value.

- The correlation coefficient is not interval-scaled. Therefore, it cannot be interpreted as a percentage measure of the relationship.

```
. corr CumulativeEarnings Age Female Employed Voted Patience FirstMover if Round==7
(obs=23)

              |  Cumula~s      Age    Female Employed Votedi~n Patience FirstM~r
--------------+------------------------------------------------------------------
 Cumulative~s |   1.0000
          Age |   0.3133   1.0000
       Female |  -0.1727  -0.2460   1.0000
     Employed |   0.1903   0.6163  -0.0731   1.0000
 VotedinEle~n |   0.1441  -0.1785  -0.0363  -0.2499   1.0000
     Patience |   0.3137   0.0694  -0.0470  -0.1547   0.1587   1.0000
    FirstMover |   0.2401   0.1354  -0.0826   0.2241  -0.0200   0.0039   1.0000
```