

MW24.2 Experimental Economics (SS2021)

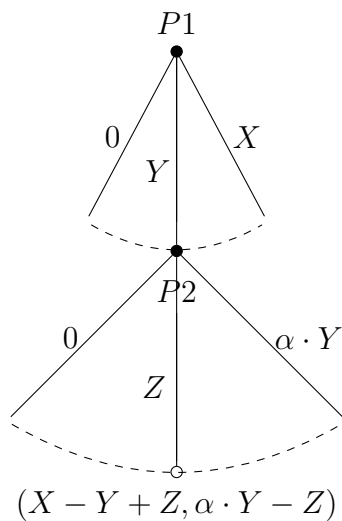
Trust and Reciprocity

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Trust Game

~ also, investment game, sequential Prisoner's Dilemma etc.

* Two-person sequential move game. The *trustor* is endowed with a budget of X and sends a portion of it, Y , s.t. $0 \leq Y \leq X$, to the *trustee*. The *amount sent* gets multiplied by $\alpha > 1$. The trustee then *sends back* some amount Z , s.t. $0 \leq Z \leq \alpha \cdot Y$. The payoffs are $X - Y + Z$ and $\alpha \cdot Y - Z$, respectively [Berg et al., 1995].



* SPNE: $\{Y^* = 0; Z^* = 0\}$

* surplus (efficiency) maximization: $\{Y^* = X; Z^* \in [0, \alpha \cdot Y^*]\}$

* *rational* (i.e., selfish) trustor can make positive transfers if the trustee is expected to be *irrational*

Trust as a means of a *joint* improvement over the subgame-perfect outcome:

- * placing trust in the trustee puts the trustor at risk
 - * the trustee's decision benefits the trustor at a cost to the trustee
 - * both players can benefit from the transaction
- \Rightarrow *Reciprocation hypothesis* [e.g., Rabin, 1993]¹ suggests that the amounts sent and returned should be *positively* correlated

¹Matthew Rabin. Incorporating fairness into game theory and economics. *American Economic Review*, 83(5):1281–1302, 1993

Reciprocity (direct) [Rabin, 1993]:

- * people are willing to sacrifice their own material well-being to help others who are being kind
 - * people are willing to sacrifice their own material well-being to punish others who are being unkind
 - * both motivations have a greater effect on behavior as the material cost of sacrificing becomes smaller
- ⇒ players care not only about the others' actions but also about their motives
- ⇒ non-N.E. strategies can be supported by “fairness equilibrium” conditional on beliefs

Berg et al. [1995]

- * between-subject; double-blind; treatments: no history and social history
 - * *both* players have endowments of 10; multiplier = 3
 - * social history treatment ← behavioral data from the no history treatment
- (?) is trust evolutionary viable (i.e., can it have emerged as a norm)?

no history [Fig. 2]:	social history [Fig. 3]:
⇒ 30/32 send posit. amounts	⇒ 25/28 send posit. amounts
⇒ 5.16 sent and 4.66 returned (avg)	⇒ 5.36 sent and 6.46 returned (avg)
⇒ transfers of 5 or 10 → <i>positive</i> net returns (i.e., all-or-nothing norm) [Appendix B]	⇒ 5 → 7.14 and 10 → 13.17; 5 or 10 sent in 50% cases
	⇒ reciprocity hypothesis confirmed

Trust (reciprocity) versus altruism/inequality aversion:

- * transfers resulting from other-regarding preferences do *not* depend on the behavior of others [e.g., inequality aversion à la Fehr and Schmidt, 1999]
- * transfers resulting from trust or reciprocity are *conditional* on the behavior of others [e.g., Rabin, 1993]

Cox [2004]

- ~ reciprocity (trust) \Leftrightarrow conditional kindness
- ~ other-regarding preferences \Leftrightarrow unconditional kindness
- * to trust is to have a particular *belief* about the behavior of others
- (!) even *selfish* trustors will make transfers if the expected net return is positive
- * check if Berg et al. [1995] results are indeed due to trust (reciprocity) or rather due to other-regarding preferences
- * treatments (between-subject):
 - $A \sim$ control [Berg et al., 1995]
 - $B \sim$ trustee is passive
 - $C \sim$ trustor is passive (transfers taken from A ; unknown to the trustees to avoid *indirect* reciprocity)
- \Rightarrow 26/32 trustors send positive amounts in A ; 5.97 on average [Fig. 1]
- \Rightarrow 19/30 trustors send positive amounts in B ; 3.63 on average [Fig. 2, Table 1]
- \Rightarrow 17/32 trustees return positive amounts in A ; 13/32 in C
- \Rightarrow average back transfers of 4.94 and 2.06 in A and C , respectively [Fig. 3]
- \Rightarrow both other-regarding and reciprocal behavior observed [B , C and $B - A$, $C - A$]

Reciprocity (Gift Exchange) Game

~ contrary to the Trust game, it is the *second* player who ‘generates’ welfare

- * Two-person sequential move game. The *employer* offers wage w , s.t. $w \in [\underline{w}, \bar{w}]$. Upon observing w , the *worker* chooses effort level e , s.t. $e \in [\underline{e}, \bar{e}]$. The respective payoffs are $v \cdot e - w$ and $w - c(e)$, s.t. $c(e) \sim \text{convex}$, $c(\underline{e}) = 0$, and $v > 0$ [Fehr et al., 1993].

⇒ SPNE: $\{w^* = \underline{w}; e^* = \underline{e}\}$

⇒ surplus (efficiency) maximizing outcome: $c'(e) = v \Rightarrow e^* > \underline{e}$

Fehr et al. [1993]

~ test of the “fair wage-effect” hypothesis (i.e., higher wages lead to higher effort levels even in the absence of penalties for shirking)

* stage 1:

- employers make wage proposals (progressive one-sided oral auction)
- workers decide whether or not to accept ($\#\text{employers} < \#\text{workers}$)

* stage 2:

- hired workers choose their effort level [Table 1]

* 12 repetitions; matching identities unknown (i.e., stranger matching)

* payoffs = $\{(126 - p) \cdot e; p - m(e) - 26\}$ or $\{0; 0\}$

~ price of labor should converge to the market clearing wage under the “no fairness” hypothesis ($p^* = 30$ since the wages had to be multiples of 5)

⇒ lowest price of 30 observed only once out of 276 cases

⇒ average price was 72, providing 42% of the surplus to the worker

⇒ minimum effort chosen in 16% cases, average was 0.4

⇒ wage and effort level are *positively* correlated [Table 2, Fig. 1]

⇒ reciprocal behavior persists over time [Fig. 2]

Suggested Literature

- Charles A Holt. *Markets, games, & strategic behavior*. Boston Pearson Addison Wesley, 2007 [Chapter 24]
- Joyce Berg, John Dickhaut, and Kevin McCabe. Trust, reciprocity, and social history. *Games and Economic Behavior*, 10(1):122 – 142, 1995
- James Cox. How to identify trust and reciprocity. *Games and Economic Behavior*, 46(2):260–281, 2004
- Ernst Fehr, Georg Kirchsteiger, and Arno Riedl. Does fairness prevent market clearing? an experimental investigation. *The Quarterly Journal of Economics*, 108(2):437–459, 1993
- * Ernst Fehr and Bettina Rockenbach. Detrimental effects of sanctions on human altruism. *Nature*, 422(6928):137–140, 2003