

to the organization of economic activity in a market context, either under assumptions resembling perfect markets or allowing for some imperfections that give rise to second-best outcomes. It is in the wider sense of incorporating transaction costs into economic analysis that gives rise to a comparative institutional analysis of alternative forms of organization, in which markets are but one of several alternative resource allocation mechanisms.

Matthias Klaes

See also: Bounded Rationality; Carnegie School; Decision Cost; Greenwald-Stiglitz Theorem and Behavioral Economics; Williamson, Oliver

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TRUST

Trust is a means to reduce the complexity of the social world (Luhmann 2000) that facilitates and enhances cooperation in general and in the economy in particular. It is related to future behavior of persons and institutions that is based on the experience of certainty where no real certainty exists. It is defined as "willingness of a party to be vulnerable to the actions of another party based on the expectation that the other party will perform a particular action important to the trustor, irrespective of the ability to monitor or control the other party" (Mayer, Davis, and Schnorrmann 1995, 712). Trust as readiness to undertake a risky action is based on the expectation that the other party is trustworthy. This expectation can be either reason-based (explicit) or implicit.

Reason-based trust originates from (1) the perception to depend on another party to achieve a specific goal, and (2) the trustor's evaluation of the trustee's willingness and ability to achieve the specific goal, that is, the trustee's motivation and competence as well as benevolence in taking actions that are not to the disadvantage of the trustor. Additionally, situational conditions such as specific opportunities or hindrances to achieve the goal are evaluated. Based on reflective processes the trustor decides whether or not to trust the other party. In contrast, implicit trust results from automatic and unintentional processes and is based on the perception of similarity between the trustor and trustee, shared social identity, and shared values (Castelfranchi and Falcone 2010).

Perception of trustworthiness and trust also depend on biological factors, dispositional and personality traits. For instance, high levels of the hormone oxytocin

appear to facilitate trust (Koslowsky, Heinrichs, Zak, Fischbacher, and Fehr 2005). Regarding the disposition to trust, cultural characteristics (power distance between authorities and subordinates, masculinity versus femininity), early developmental experiences and socialization (affective bonds and attachment between children and parents), and personality traits (dominance, Machiavellianism) are related to trust. Trait-based disposition to trust is stable across situations and mediates the influence of explicit and implicit determinants of trust. On the extreme, the disposition to trust and mistrust leads to blind trust or the incapacity to trust at all (Mayer et al. 1995).

Trust can be directed towards people, towards an authority or institution, or (depending on the use of terms trust and reliance) towards a machine or technology. Trust in others is positively associated with general well-being, with social capital in organizations and the society, with well-functioning democratic processes in the society, and also with economic success and growth (Punam 1995). Trust in an authority fosters acceptance and commitment to rules and laws. It is positively related to perceived fairness of procedures and distribution of resources, and it fosters successful leadership in organizations and policy of governmental authorities (Tyler and Kramer 1996). Trust in technology is essential for the acceptance of a technology and determines, for instance, well-functioning human-computer interaction in work settings, multiagent systems, and networked computer systems, and also virtual collaboration of work teams, e-commerce, e-learning, or tele-medicine.

Research methods to study trust are surveys and panel studies as well as observation of behavior in laboratory experiments. Panels such as the Eurobarometer periodically survey people's trust in the economy, government, and public institutions or fellow citizens. Questionnaires to assess reason-based and implicit trust as well as perceived trustworthiness of others or authorities are presented by Dietz and Den Hartog (2006). Laboratory experiments on antecedents and consequences of trust are frequently conducted in behavioral economics and economic psychology. They are often conceptualized within game theory and addressed as "social dilemma games," "ultimatum game," "prisoner dilemma game," "public good game," "investment game," and "trust game" (Güth, Ockenfels, and Wendel 1997; Kreps 1990).

While trust is easily destroyed, establishing or reestablishing trust is difficult and protracted. Gärting, Kirchler, Lewis, and van Raaij (2010) reflect about how trust in financial institutions originates, and, if it is gone, how it can be regained. They identify seven factors: competence, stability, integrity, benevolence, transparency, value congruence, and reputation. While the first four are necessary preconditions or "dissatisfiers" that bring trust from negative to neutral, the last three are "satisfiers" that bring trust from neutral to positive.

Erich Kirchler and Katharina Gangl

See also: Game Theory (Behavioral/Cooperative); Moral Motivation; Public Good Game; Trust Game; Trust Heuristic; Ultimatum Game

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TRUST GAME

The *trust game* (also referred to as the *investment game*) is a two-player, one-shot sequential game with salient fairness considerations. Trusting and trustworthy behavior in the game allow players to reap the benefits from cooperation and increase their earnings. The game was first introduced to the literature by Berg, Dickhaut, and McCabe (1995), who designed it to experimentally study trust and reciprocity behavior in an investment setting.

The game is played by two players, the First Mover (FM; also referred to as *Trustor*) and the Second Mover (SM; also referred to as *Trustee*), both endowed with \$10 from the experimenter. In stage one, the FM decides how much of his initial endowment to send to his counterpart. The remaining portion of the endowment is his to keep. The amount sent is tripled by the experimenter while the amount kept is not transferred. In stage two, the SM observes the tripled amount and decides how much of it to return to the FM and how much to keep. The amount kept by the SM is added to his own endowment (if any). Each dollar returned by the SM to the FM costs the SM one dollar. After the SM's choice, the game ends and the payoffs are realized.

The unique subgame perfect Nash equilibrium of the trust game for the self-regarding preferences (or *economic man*) model with perfect information can be solved by using backward induction: In stage two, a selfish SM will return zero. Realizing this, a selfish FM will send zero in stage one. Such play yields equilibrium payoffs of (\$10, \$10). This subgame perfect Nash equilibrium is Pareto-inferior to

some alternative feasible allocations in which the FM sends a positive amount to the SM, which increases the stake to be divided between them. For example, if the FM sends all \$10, the SM receives \$30 and returns \$20 back to the FM, and the players end up with final payoffs of (\$20, \$20).

In experiments, human participants in the role of FMs identify the possibility of creating a surplus by sending positive amounts to paired SMs, which has been interpreted as using trust for mutual gain. Moreover, many SMs share the created surplus with FMs by returning positive amounts back to FMs, which has been interpreted as the existence of trustworthiness. For example, in the original Berg, Dickhaut, and McCabe (1995) experiment, FMs sent \$5.15 on average while as many as 30 out of 32 sent at least some money. These amounts were then tripled by the experimenters and thus FMs' actions resulted in higher total payoffs to the pair. Of the 30 SMs who received a positive amount, only 6 responded with returning zero, while all other SMs returned positive amounts; \$15.48 on average.

Explanations for this behavior have incorporated alternative motives for other-regarding behavior, including trust, reciprocity, and other-regarding preferences. In particular, the FM could send a positive amount because of trust that the SM will return some of the money and/or because of unconditional other-regarding preferences, for example, altruism. The SM could return some money because of positive reciprocity and/or because unconditional other-regarding preferences, for example, altruism or inequality aversion. Cox (2004) presents an experiment that distinguishes between these explanations. His design includes the standard trust game and two specially designed dictator games that eliminate the possibility of trust and reciprocal behavior by FMs and SMs, respectively. By comparing subjects' behavior in the three games, Cox finds that the FMs in the trust game exhibit both trust and other-regarding behavior and that the SMs exhibit both reciprocity and other-regarding behavior as well.

Extensions and modifications: In some experimental settings the choices of both players are restricted to whole dollar amounts or to a binary decision, endowments and the multiplicative factor are varied, and multiplicity of players is introduced. Other experiments vary procedures: Participants have to earn the initial endowment, the game is played repeatedly, players change roles, the degree of anonymity can vary, and communication is allowed.

Maroš Servátka and Radovan Vadovič

See also: Altruism; Experimental Design; Fairness; Norms; Public Good Game; Reciprocity; Trust

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Making
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Economics

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