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Trust, but verify? Monitoring, inspection costs, and opportunism under limited observability☆

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ABSTRACT

Is feedback on trustworthiness necessary for the functioning of economic relationships? In many real-world economic environments, such feedback can at best be acquired through costly monitoring, raising questions of how trust and efficiency can be maintained. In the lab, we conduct a modified finite-horizon binary trust game in which we vary the observability of the trustee's actions. In the baseline condition, trustors can perfectly observe their trustee's actions. We compare this to a condition in which that actions are unobservable and three conditions in which they must be actively monitored, at zero, low or high cost, respectively. Counter-intuitively, differences in observability do not lead to significant differences in trust and efficiency, but the levels are supported by very different information structures: while trustors monitored every action under zero observation costs, most of trusting actions were "blind" – trustors did not learn whether their trust was honored or not – under costly monitoring. Even under complete unobservability almost half of the available surplus was realized. There are distributive impacts, however: the gains from trust favor trustees under the more adverse informational conditions. The behavioral patterns are consistent with the fact that trustors' beliefs about their trustee's conduct are almost invariant across conditions.

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1. Introduction

Since trust is an important prerequisite for realizing the gains from cooperating in the many circumstances in which contractibility is limited (e.g. Fukuyama, 1995; La Porta et al., 1997; Zak and Knack, 2001), its nature and determinants are of great interest to economics (e.g. Sutter and Kocher, 2007; Fehr, 2009; Cassar and Rigdon, 2011), policy-making (e.g. Dasgupta and Serageldin, 2000; OECD, 2015), and organizational management (e.g. Ho and Weigelt, 2005; Bolton et al., 2013; Özer et al., 2014). When complete contracting is infeasible, initiating mutually beneficial transactions requires confidence in the participants that the other parties will not behave opportunistically (Greif, 2006). In such situations, to trust "means that you rely on others not to take advantage of you", and to be trustworthy "means you do not take advantage of others when trusted" (James, 2002, p. 293).

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Game theory highlights that among the determinants of trust and trustworthiness, repetition and observability of actions stand out. If parties are sufficiently patient, the "shadow of the future" implicit in repeat interactions is predicted to support trust through a disciplining effect on opportunistic behavior (e.g. Kreps et al., 1982; Fudenberg and Maskin, 1986). Likewise, observability of actions is predicted to support trust by ensuring that (non-)opportunistic behavior is detectable (e.g. Kandori, 1992a,b; Fudenberg et al., 1994). This assures that trustors can condition their actions on information about the past actions of their trustees, making an investment into a reputation for trustworthy behavior worthwhile. These predictions have not only been borne out by laboratory experiments based on the well-known "trust game" with immediate and complete feedback (Camerer and Weigelt, 1988; Anderhub et al., 2002; Engle-Warnick and Slonim, 2004, 2006a,b; Cochard et al., 2004), but recent evidence revealed how surprisingly robust trust is with respect to the structure of repeat interactions if the information environment is sufficiently rich (Bracht and Feltovich, 2009; Charness et al., 2011; Falk and Zehnder, 2013; Duffy et al., 2013).

In many economic interactions that involve trust, observability of actions is far from guaranteed. A familiar deficiency is that the trustee's response to being trusted is not automatically and freely observable by the trustor, even when trustor and trustee interact repeatedly in stable pairs. Typical examples are situations of spatially extended supply networks that put physical distance between the trustor and the trustee (Greif, 1993; Özer et al., 2014) or situations of structural information asymmetry such as expert knowledge in technologically complex business sectors (Emons, 1997; Dulleck and Kerschbamer, 2006). When trustors decide to engage in economic interactions under such circumstances, they can choose to either stay uninformed about the trustee's action or, if feasible, *monitor* the trustee's action. By "monitoring" we mean a deliberate action to learn about co-players' actions, e.g. by engaging in own monitoring efforts (Belot and Schröder, 2015) or through third-party verification (Roels et al., 2010). The need for as well as the feasibility of monitoring is a routine feature of economic and other social interactions. It is particularly salient when monitoring is not casual, but requires costly effort.[1] The basic logic is also enshrined in the Russian proverb "Доверяй, но проверяй" ("trust, but verify").

In this article, we present a laboratory experiment designed to investigate under controlled conditions how such limited observability of trustworthiness and the level of monitoring costs impact on trust in repeat interactions.[2] Game theoretical analysis (Mailath and Samuelson, 2006) and behavioral evidence on the impact of exogenously imposed information constraints in cognate social dilemma games (Sell and Wilson, 1991; Holcomb and Nelson, 1997; Cason and Khan, 1999; Grechenig et al., 2010; Ambrus and Greiner, 2012) give reason to expect a negative relationship between information constraints and trust levels. This is also in line with the intuition that constraints on the observability of trustee's actions favor cheating over reciprocating trust, since not only is there a higher likelihood for the trustee to get away with cheating, but it is also more difficult for trustees to build up a reputation for trustworthiness since reciprocating actions are not bound to be observed by the trustor. This makes trusting costlier in expectation terms, especially for risk-averse trustors, and should make trustors less inclined to "rely on trustees not to take advantage of them."

2. The experiment

The basis of the experiment is a standard finite-horizon binary trust game (see e.g. Bohnet et al., 2005; Huck et al., 2012). A sample of 222 undergraduate student subjects were randomly matched into groups of two. In each pair, one subject was randomly assigned to the role of "trustor" and the other subject to the role of "trustee". All pairs played twelve rounds of the following constituent game: First, the trustor chooses between option "pink" and option "yellow". If "yellow" is chosen, both players get 15 tokens. If the trustor chooses "pink", the period continues with the trustee's choice between option "brown" and option "blue". If the trustee chooses "brown", she gets 25 tokens and her trustor 30 tokens. Otherwise, she keeps 50 tokens for herself while her trustor gets 5 tokens.

Each pair was randomly assigned to one of five conditions that vary observability and inspection costs. There are two baseline conditions, which provide limit cases of observability. In the "Automatic Feedback" (AF) condition, each player was informed about the co-player's action automatically, at no cost, without error, and without delay in each round. In the "No Feedback" condition (NF), trusting first movers did not observe the trustee's action, or payoffs from which that action could be deduced, until after the last round. In the other three conditions, trustors also remained uninformed about the outcome

[1] Narratively, this has been recognized in a variety of relevant contexts, such as common-pool resource management (Ostrom, 1990; Weissing and Ostrom, 1991; Rustagi et al., 2010), team production and labor relations (Shapiro and Stiglitz, 1984; Kandel and Lazear, 1992; Dong and Dow, 1993), finance (Williamson, 1986; Stiglitz, 1990; Armendáriz and Morduch, 2005), and public safety (Sampson et al., 1997). See Ben-Porath and Kahneman (2003), Miyagawa et al. (2008), and Awaya (2014) for game theoretical motivations. On agency theory's basic assumption that the agent's actions are unobservable to the principal, Varian (1990, p. 153) commented that "in reality, it is often not the case that... effort levels are really unobservable; rather they simply may be very costly to observe. One may choose to model high-cost actions as being infeasible actions, but in doing so, one may miss some interesting phenomena."

[2] Our conditions fit into the definition of "information mechanisms" coined by Bracht and Feltovich (2009, p. 1037), namely "no changes in the game other than the opportunities to give and to receive information". They study two such mechanisms in the context of a trust-game-experiment: cheap talk from the trustee to the trustor, and observation of the trustee's previous action. Our experiment differs in two key dimensions: First, in our main treatments, observation is endogenous – the trustors decide themselves whether they want to monitor their trustee in any given round – while in Bracht and Feltovich (2009) observation is automatic. We also consider monitoring costs, while in their experiment observation is free. Second, we implement "true" repeated games in which the participants remain together in stable pairs, whereas Bracht and Feltovich (2009) implement matching games in which pairs are re-matched in each round.

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