Trust and reciprocity have been recognized as a means of reducing transaction cost and achieving mutually beneficial outcomes when legal contracts and third-party enforcement are absent or too costly. Some economic activities require trust and reciprocity among agents who are not familiar with each other and only have economic interactions at randomly determined times. One example is e-commerce transactions. In online markets, agents are essentially anonymous, and transactions take place between strangers who have no contact except through cyberspace. Usually the buyer needs to make the payment first, and then the seller delivers the item. If it is a one-shot transaction, a self-interested seller has an incentive to deliver nothing or an item far less valuable than promised, and a rational buyer will not send the payment in the first place. We observe, however, millions of transactions every day on the Internet. Another example is the credit market. The credit card company needs to trust the consumer’s accountability to repay the credit, especially when the consumer is new to the market. On the other hand, we observe in both markets that there is an information system that records and disseminates information about agents’ transaction history. For example, many online markets employ the “feedback” mechanism, and most credit card companies share information about consumers’ credit history.

This paper reports the findings of an experiment which uses a similar environment to the one described above; that is, subjects are completely anonymous and randomly matched with each other to play a trust game in each period. We provide evidence to answer the questions of whether or not the social norm of trust and reciprocity can be sustained in this environment, and whether or not information is effective and necessary to sustain the social norm of trust and reciprocity.

Previous literature on repeated games (Fudenberg and Maskin, 1986) shows that any mutually beneficial outcome can be sustained as a subgame perfect equilibrium if the same set of players plays the same stage game ad infinitum. In this case, reputation is an effective means of enforcing cooperative behavior.

When each agent is anonymous and interacts only at randomly determined times with any other particular agent in the finite population, Kandori (1992) shows that the social norm of cooperation can be sustained as a sequential equilibrium in the Prisoners’ dilemma game, if the deviation triggers a contagious reaction and the consequence of the eventual destruction of the norm is sufficiently severe.

Lee and Xie (2007) theoretically extend Kandori’s (1992) results to the trust game
and provide the sufficient conditions that support the social norm of trust and reciprocity as a sequential equilibrium. As Ellison (1994) notes, the results of the previous papers heavily rely on the fact that the prisoner's dilemma has a dominant strategy equilibrium. Lee and Xie (2007) show that those results can be extended to other classes of games.

Based on Lee and Xie (2007), we choose the following trust game as the stage game. The social norm of full trust and reciprocity is sustained as a sequential equilibrium, when agents infinitely play the stage game with randomly matched partner.

The main treatments consist of whether or not the information about the Trustee’s last-period behavior is available to the Investor. We refer them to NoInfo and MinInfo treatment respectively. Among the between-subject treatments, we conducted 3 sessions of NoInfo treatment and 3 sessions of MinInfo treatment. Among the within-subject treatments, we conducted 2 sessions of NoInfo -> MinInfo treatment and 2 sessions of MinInfo -> NoInfo treatment.

Each session involves multiple supergames. A supergame is a sequence of indefinitely repeated trust games. At the beginning of each supergame, each subject is randomly assigned to be an investor or a trustee. At the start of each stage game, each investor is randomly and anonymously paired with a trustee. Subjects maintain their role within a supergame, but they are reassigned as an investor or a trustee when a new supergame begins. So our design not only allows subjects to learn from multiple plays of indefinitely repeated games, but also allows them to learn from different roles.

To implement the indefinitely repeated play of the stage game, we ask subjects one by one to draw a number using a ten-sided die after each stage game. The supergame continues if
the number is from 0 to 7, and it ends if the number is 8 or 9. The experimenter then announces whether to play another supergame, depending on the time available.

The main evidence we find is that providing the information about trustees’ immediate past behavior to investors dramatically increases the level of trust and reciprocity. When no information is provided, the social norm of no trust and no reciprocity is selected. When the information is provided, however, a social norm of trust and reciprocity emerges. The following table summarizes the basic results.

<table>
<thead>
<tr>
<th></th>
<th>% of Invest</th>
<th>% of Return given Invest</th>
<th>% of Invest and Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>between (NoInfo)</td>
<td>21.9%</td>
<td>43.1%</td>
<td>11.5%</td>
</tr>
<tr>
<td>between (MinInfo)</td>
<td>66.7%</td>
<td>80.7%</td>
<td>55.0%</td>
</tr>
<tr>
<td>within (NoInfo-&gt;MinInfo)</td>
<td>23.3%-&gt;57.3%</td>
<td>47.3%-&gt;89.0%</td>
<td>10.8%-&gt;50.8%</td>
</tr>
<tr>
<td>within (MinInfo-&gt;NoInfo)</td>
<td>44.6%-&gt;24.4%</td>
<td>67.6%-&gt;40.8%</td>
<td>31.8%-&gt;9.8%</td>
</tr>
</tbody>
</table>

Table 1: average frequency of between-subject treatments and within-subject treatments

In the between-subject treatments, the frequency of Invest, Return given Invest, Invest and Return are all significantly different in the NoInfo treatment and MinInfo treatment at the level of 0.05 by the Robust Rank-Order test. In the within-subject treatments, the differences in all three measures are significant at the level of 0.0625 by the Wilcoxon Signed Ranks test.

Our findings suggest that information is effective and necessary to implement trust and reciprocity. Interestingly, the evidence from the within-subject treatments shows that the effect of information is much stronger in the NoInfo->MinInfo case than in the MinInfo->NoInfo case. Furthermore, compared to previous experimental results in the similar environment (Duffy and Ochs, 2005), our results suggest that information is more effective in the trust game than in the Prisoners' dilemma game. It will be important to identify the underlying elements which lead to the difference.

Selected References: