

**Does Insurance Increase Trust?  
Experimental Evidence on Institutional Design**

**Mohamad Al-Ississ and Iris Bohnet\***

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**Abstract**

This paper examines whether an instrument commonly used to mitigate risk, insurance, also promotes trust. We employ a binary-choice trust game and show that theoretically, the answer is not obvious. Principals are confronted with a complex optimization problem: insurance lowers the cost of betrayal but if agents are inequality averse or reciprocally motivated, it also increases its likelihood. In experiments in Jordan and the US, trustworthiness decreases as insurance increases. The relationship between insurance and trust is not significant in Jordan and positive in the US. When designing institutions, both cultural factors and social preferences should be taken into account.

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\* Al-Ississ: Harvard Kennedy School, 79 JFK Street, Cambridge, MA, 02138, (email: [alississ@post.harvard.edu](mailto:alississ@post.harvard.edu)). Bohnet: Harvard Kennedy School, 79 JFK Street, Cambridge, MA, 02138, (email: [iris\\_bohnet@harvard.edu](mailto:iris_bohnet@harvard.edu)). We thank Al-Zaytoonah Private University in Amman, Jordan for permission to conduct the experiment and for their logistical support. Financial support from the U. S. Army Research Laboratory and the U. S. Army Research Office under grant number W911NF-08-1-0144 is gratefully acknowledged.

## **1. Introduction**

Insurance decreases losses in case bad things happen. People buy flood insurance to protect themselves against losses from natural catastrophes or auto insurance to protect themselves against the costs involved in car accidents. In many countries, damages protect the parties to a contract against the losses suffered from breach. The amount of damages is either agreed on by the parties when entering a contract or specified by courts and awarded to the injured party after breach has occurred. Although insurance and legal remedies are rarely able to fully compensate the victim, they substantially decrease the risk involved in these situations.

This paper examines whether such provisions increase people's willingness to take social risk where the agent of uncertainty is another person rather than nature. More specifically, we are interested in trust interactions where a first mover, the principal, makes herself vulnerable by passing money on to a second mover, the agent, who can either reciprocate her generosity or betray her trust by keeping most of the surplus for himself and making the principal worse off than if she had never trusted. Insuring the principal against the downside risk of trusting by decreasing the cost incurred in case of betrayal decreases the risk involved when trusting but may also affect the behavior of the agent, turning this into a difficult optimization problem for the principal and an interesting question to study empirically.

A better understanding of the relationship between insurance and trust is of particular relevance for countries and regions confronted with questions of institutional design trying to find the right balance between traditional and modern forms of risk management. Thus, we first focus on one such country, Jordan, where institutional

protection traditionally has played a small role in fostering trust and where the legal system is based on a combination of codes, including Islamic Law, the Ottoman and French codes, and some influence of the British Common Law. We then compare our results with evidence from the United States, a country where insurance and damages are central features of risk and trust management but where questions of institutional design have resurfaced with the current financial crisis. Rescue packages and bailouts have raised concerns about moral hazard, and the compensation of victims has done little to rebuild trust in the economy and government. Monetary compensation can alleviate financial losses but it cannot heal the wounds left behind by broken promises and violations of trust (Bohnet et al. 2008).

Damages are used conservatively in Jordan as its Civil Code has “distinctive Islamic features which are not found in Arab Codes enacted earlier” (Saleh 1993, 165). The liberal use of damages is feared to promote irresponsible risk taking or speculation (“gharar”). For example, if parties did not specify damages arising from a breach in their contract, then courts should assess these damages on the “basis of the damage actually sustained at the time it occurred”.<sup>1</sup> The law does not include in its assessment “compensating the victim of a breach for lost profit or for moral prejudice – both considered as conjectural and non-tangible and therefore contrary to Shari’a teaching” (Saleh 1993, 166).<sup>2</sup> The implementation of Islamic Law is supported by a majority of Jordanians.<sup>3</sup>

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<sup>1</sup> The Civil Code of the Hashemite Kingdom of Jordan Number 43 for the year 1976, Article 363.

<sup>2</sup> This is not the case in the laws of other Middle Eastern countries such as “Egypt, Libya, Syria, and Iraq [which] all make room in their statutes for loss suffered and lost profit as well as for compensation for moral prejudice.” (Saleh 1993: 166).

<sup>3</sup> Davis and Robinson (2007: 141) report that 54 percent of Jordanians consider it to be “very important” that the government “only implement the laws of shari’a.” In a sample of seven Muslim countries (Algeria, Bangladesh, Egypt, Indonesia, Jordan, Pakistan, Saudi Arabia), this is the second highest percentage

More generally, the importance of legal remedies seems to be related to how trust is fostered in a society. Bohnet et al. (2010) showed that trust tends to be produced by decreasing the cost of betrayal in Western countries through institutional protection but by decreasing the likelihood of betrayal through repeated game and reputational incentives in group-based societal organization in Arab Middle Eastern countries. “Aman tends to convey a sense of personal attachment between those who trust one another rather than confidence in institutions, office-holders, or even one’s own knowledge or abilities. ... For Arabs, who believe that it is contexts of relationship, not invariant capabilities, that most fully define a person, actively entangling them in webs of indebtedness constitutes the greatest predictability and security that one can have for their actions towards oneself” (Rosen 2000: 135-136).

We employ experiments to examine how people respond to a decrease in the losses incurred by the insured party in case of betrayal. For ease of understanding, we refer to decreases in the cost of betrayal as “insurance,” understanding that real world insurance provisions involve more complexities. Rather, we see this as a first step towards “test-bedding” institutional interventions aimed at making contractual relationships more attractive by focusing on the most basic notion of insurance or damages, namely that they decrease the losses incurred by the harmed party. If people do not respond to changes in the cost of betrayal in the laboratory, we may be particularly wary about introducing such changes in the field.

We ran binary-choice trust games and examined the impact of changing the downside risk by varying the payoffs of the injured party. We found that Jordanians

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supporting the Shari’a, only surpassed by Saudi Arabia with 74 percent indicating that this is very important to them. In contrast to Jordan, the Shari’a is the sole basis of the legal code in Saudi Arabia.

participating in our experiments were not more likely to offer trust as the cost of betrayal decreased. In fact, trust responded slightly negatively and trustworthiness significantly negatively to increases in insurance. The decrease in trustworthiness as insurance increased posed a difficult optimization problem for our principals: while insurance decreased the cost of breach, it also made breach more likely. Agents seemed to respond to the principals' vulnerability and reward trust less, the less vulnerable the principal was.

To further examine this conjecture, we included groups that were naturally more vulnerable than others in our experiment. Specifically, we examined how agents responded to female instead of male principals, and to principals from Palestinian instead of Jordanian origin. Women and Palestinians are generally considered as more vulnerable in the Jordanian context. Jordanian women have “the legal capacity to enter into financial contracts, but the country’s social structure still deprives many of them from owning and controlling economic resources” (Social Institutions and Gender Index, 2009)<sup>4</sup>. The UN Human Development Report estimates the ratio of Jordanian female income to male income at 0.19 (Human Development Report, UNDP, 2007)<sup>5</sup> Similarly, a large number of Palestinians in Jordan have refugee status excluding them from many services and opportunities. Palestinians who hold Jordanian citizenships also face economic discrimination and political exclusion.<sup>6</sup> Our experimental results suggest the same pattern

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<sup>4</sup> The Social Institutions and Gender Index (SIGI), OECD Development Centre, <http://genderindex.org/country/jordan>, accessed on March 17, 2009.

<sup>5</sup> Women comprise just over 10.4 per cent of land and real estate owners and this ownership is mainly due to inheritance not business (UNIFEM 2009, 43). . Women play a marginal role in politics constituting 6.4% of the parliament members, making Jordan the 117<sup>th</sup> country in the world in female parliament membership as of May 31<sup>st</sup>, 2010 (The Inter-Parliamentary Union Women in National Parliaments, May 31, 2010 report).

<sup>6</sup> Palestinians are implicitly restricted from “appointments to positions in the government and the military, admittance to public universities, and the granting of university scholarships” (Minorities at Risk Project 2009). Despite constituting the majority of the population, Palestinians “contributed 6 of 28 [government] ministers, 6 of 40 senators and 11 of 80 lower house members [in 2003]. No Palestinians held any of the

in both cases of these two vulnerable groups: agents were more likely to betray, the less vulnerable their counterpart was, that is, when confronted either with someone from Jordanian origin or a man.

This is not just a Jordanian phenomenon: American agents also tended to betray their principal's trust more, the less vulnerable their counterpart was. In contrast to Jordan, however, American principals did not anticipate this and trusted more, the less vulnerable they were. We show that agent behavior is in line with a simple model of inequality aversion (e.g., Fehr and Schmidt 1999) where agents dislike advantageous inequality between themselves and their principals. Agents were more likely to reward trust, the larger the payoff difference between themselves and their agents was in case of betrayal, whether due to randomly assigned payoff differences in the game or due to naturally occurring payoff differences in daily life in Jordan. Our findings suggest that the more people dislike payoff differences between themselves and others, the more likely insuring people against the cost of betrayal may backfire.

The remainder of the paper is organized as follow: Part 2 introduces a conceptual framework, Part 3 presents the experimental design and procedures, Part 4 discusses the results, and Part 5 concludes.

## **2. Conceptual Framework**

We employ a binary-choice trust game (Camerer and Weigelt 1988, Kreps 1990) to measure people's willingness to trust and be trustworthy. In it, the principal first decides whether to offer trust (T) or to exit (E). If she decides to exit, the game ends and

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governorships in Jordan. In the electoral system, greater representation is given to regions with non-Palestinian populations" (Minorities at Risk Project 2009).

both parties earn  $E$ . If she offers trust, then the agent has to decide whether to reward trust ( $R$ ) or to betray trust ( $B$ ). If he rewards, both the agent and the principal earn  $R$ ; if he betrays, the agent earns  $B$  and the principal  $X$ . Assuming money-maximizing preferences,  $B > R > E$  for the agent, and  $R > E > X$  for the principal. Thus, money-maximizing agents will always betray, leading money-maximizing principals to never offer trust.

A large number of experimental studies suggests that this is not how people behave. Non-trivial fractions offer and reward trust (for a review, see Fehr 2008). Many agents are not only motivated by self-interest, and principals anticipate this. Thus, given positive trustworthiness rates, trust may well pay and be responsive to changes in  $X$ . The larger  $X$  is, the less risky it is for the principal to trust, holding everything else constant.

Although this seems like a simple enough manipulation, to the best of our knowledge, there is no direct evidence speaking to this question. Related studies fall into two categories. The first examined the relationship between subjects' risk preferences (measured in risky choice tasks or surveys) and their willingness to trust, sometimes finding no correlation (e.g., Ashraf et al. 2006, Eckel and Wilson 2004), and sometimes reporting a positive one (Schechter 2005). The second examined principals' responsiveness to changes in the game payoffs, building on a literature in psychology on "fear" in the prisoner's dilemma game started by Rapoport (1967). Snijders and Keren (1998) applied the "fear" measure to the trust game by taking as a measure of risk the principal's incentive to exit the game as compared to trusting. They found for the Netherlands that higher risk was associated with lower trust. Malhotra (2004) also varied the principal's outside option, the exit payoff ( $E$ ), holding the betrayal payoff ( $X$ )

constant. Comparing an attractive outside option with a less attractive one, he found for the United States that individuals were more likely to trust when the exit payoff was low.

Thus, decreasing the riskiness of an action generally seems to increase willingness to trust in the Western countries studied, but people's attitudes to risk measured outside of a trust game do not seem to have a systematic effect of willingness to trust. Given that in addition to people's attitudes to risk, trust is also influenced by social preferences such as betrayal aversion (Bohnet and Zeckhauser 2004, Bohnet et al. 2008, Fehr 2008), we may not be surprised by this. In contrast to a standard risky choice task, changing  $X$  does not only affect the risk involved but it may also affect the agents' willingness to reward trust. Agents may interpret principals' willingness to make themselves vulnerable as an act of kindness, making them more inclined to reward trust, the smaller  $X$  is. While such a model of reciprocity (Rabin 1993) seems plausible, it would be even more convincing if principals had chosen the level of insurance themselves, or agents had some other way of calibrating the "kindness" of the principal's action (for such an approach in the Ultimatum Game, see Falk et al. 2003).

Alternatively, a simple model of inequality aversion, not based on intentions but only on outcomes, may account for agents being responsive to principals' payoffs in case of betrayal. The lower  $X$  is, the larger the inequality between the agent and the principal. Thus, inequality averse agents are less likely to reward trust, the larger  $X$  is. To illustrate this model, consider a simple Fehr & Schmidt (1999) utility function with inequality aversion:

$$\text{Utility (A)} = Z_A - \alpha \max\{Z_P - Z_A, 0\} - \beta \max\{Z_A - Z_P, 0\}$$

where:  $Z$  is the payoff,  $P$  is the principal,  $A$  is the agent,  $\beta < \alpha$ , and  $0 \leq \beta < 1$ .



Since in our experiment:  $Z_P \leq Z_A$ , then:

- If the agent is trustworthy:  $U(A) = R$
- If the agent is not trustworthy:  $U(A) = B - \beta (B - X)$
- Hence, the agent will be trustworthy if:  $R \geq B - \beta (B - X)$ ,
- Or put differently the agent will be trustworthy if:  $\beta \geq (B - R) / (B - X)$

In our experiments, we vary the size of  $X \in (10, 30, 50, 70, 90)$  points, with  $E=100$  points,  $R=200$  points, and  $B=350$  points. Table below presents the minimum inequality aversion parameter required to elicit trustworthiness for each  $X$  given the parameters of our experiment and the Fehr & Schmidt (1999) inequality aversion utility function. The more the principal is insured, i.e., the larger  $X$ , the larger must the advantageous inequality aversion factor,  $\beta$ , to motivate agents to reward trust.

**Table 1 Minimum  $\beta$  Required to Elicit Trustworthiness**

<b>Principal's Betrayal Payoff (X)</b>	<b>Agent will be Trustworthy if</b>
10	$\beta \geq 0.44$
30	$\beta \geq 0.47$
50	$\beta \geq 0.50$
70	$\beta \geq 0.54$
90	$\beta \geq 0.58$

With rational expectations, principals anticipate the negative relationship between insurance and the likelihood that inequality averse agents reward trust. This leaves them with a complicated optimization problem: while insurance makes betrayal less costly, it also increases the likelihood of betrayal. We thus predict:

*The more the principal is insured against losses in case of breach, the less likely the agent is to reward trust. The effect of insurance on trust is not clear as it affects the cost and the likelihood of betrayal in opposite directions.*

Note that increasing  $X$  also increases the efficiency gains to be had by trusting. If principals were motivated by efficiency preferences (e.g., Charness and Rabin 2002), they would be more likely to trust, the larger insurance was.

In order to further explore how robust our hypothesis is to other specifications of payoff inequality, we also examine the effect of naturally occurring vulnerability differences on trust and trustworthiness in Jordan. In addition to varying the cost of breach, we also varied the gender and the origin of principals and agents. We expect that the more vulnerable groups, women and principals from Palestinian origin, will elicit more trustworthiness than their respective counterparts, men and principals of Jordanian origin.

*The less vulnerable the principal is, the less likely the agent is to reward trust (holding agent vulnerability constant).*

In fact, based on a model of inequality aversion, female principals' trust should most likely be rewarded by male agents, and Palestinians' trust should most likely be rewarded by Jordanian agents. Clearly, this is a bold prediction given that concern for others may not only be affected by payoff differences but also by in-group preferences.

### **3. Experimental Design and Procedures**

We first ran our experiments with students at Al-Zaytoonah Private University in Amman, Jordan. We examined five insurance levels in three different treatment conditions, the first being a control treatment where we did not collect any additional demographic information, the second collecting information on a subject's origin, and the third collecting data on a subject's gender. We replicated the control treatment in the Harvard Decision Science Laboratory with students from the greater Boston area. In

Amman, 682 subjects participated in a total of 16 sessions (three sessions per treatment x insurance level condition plus one additional session due to small sample size in one of the preceding sessions); in Boston 176 subjects participated across 11 sessions. Subjects were identified by code numbers, anonymous to other players, randomly assigned to the role of principal or agent, and randomly matched (single-blind).

The payoffs were given in points and presented to subjects in a matrix form with neutral terminology. As indicated above, subjects earned  $E=100$  points if the principal decided to exit, and  $R=200$  points in case the principal trusted and the agent rewarded trust. If the agent breached, he earned  $B=350$  points, and the principal's payoff's depended on the insurance condition she was participating in, with  $X \in [10, 30, 50, 70, 90)$  points. To produce parity in rewards across the US and Jordan, we used the hourly wage of an undergraduate research assistant as a guideline. In addition we took into account the purchasing power differences such as standard PPP measures as well as the cost of a Big Mac across the two countries. In Jordan, each 40 points were converted to 1 Jordanian Dinar (\$1.4), corresponding to earnings between 10 points (\$0.35) and 350 points (\$12.36). In the US, each 40 points were converted to \$2, corresponding to earnings between 10 points (\$0.5 US) and 350 points (\$17.5). The experiment took approximately one hour. In Jordan, the experimental instructions were translated into Arabic. The experiments were run by the first author fluent in both Arabic and English in both countries. The English version is included in Appendix A (Experimental Instructions).

To study the impact of gender and origin, we employed a novel design. In all experimental conditions, we distributed a questionnaire collecting information on

demographic characteristics (also included in Appendix A). It was designed to yield as identical responses among the participants within each country as possible. For example, in Jordan we asked at which university they studied (identical for all) or whether they had any siblings (true for 99 percent of our sample). In the US, for instance, we asked if the subject lived in the US for more than 2 years (true for 97% of our sample) or whether the subjects were students (true for 99% of our sample). In Jordan, in addition to these questions, we added one question on origin in the origin condition and one on gender in the gender condition, thus making sure subjects were aware of this crucial piece of information without making it salient.

Tables 4 and 5 in Appendix B provide demographic summary statistics for our subjects. We were relatively successful in collecting identical information from all but for the intended gender and origin variations. The major exception is languages in Jordan where we expected that most students would speak one foreign language while in fact half spoke Arabic only.

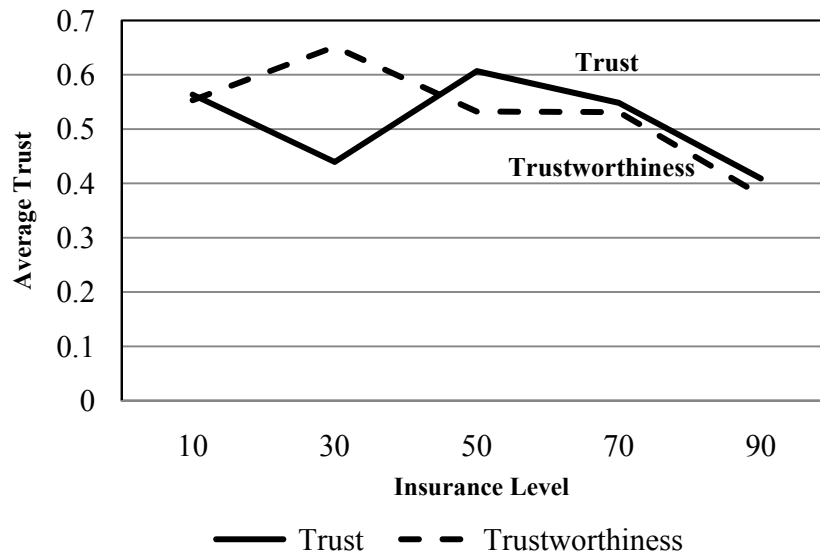
Our experiments were conducted as follows: After everyone had completed the demographic questionnaire, principals' questionnaires were given to their randomly assigned agent counterparts and vice versa. Subjects then read the experimental instructions, which were also read to them aloud, and completed a quiz testing their understanding. Only after all subjects understood the problem did we proceed with the experimental decision. Principals were asked to indicate whether or not they wanted to trust their agents. The neutral language question was: "What is your choice: X or Y?" (we labeled the principal's trust choice "Y"). We used the strategy method for agents: Before they knew their principal's decision, we asked them whether or not they would reward

trust if trust were offered. The neutral language question was “If your counterpart chooses Y, what do you choose: 1 or 2?” (we labeled the agent’s trustworthiness choice “2”). Subjects were informed of the outcome of their decisions at the end of the study and received their earnings in a sealed envelope by presenting their code number.

#### 4. Results

We first present the results for the Jordanian sample and then compare them with the results for the American sample. Figure 1 presents the likelihoods of trust and trustworthiness for each insurance level across all our experimental conditions in Jordan. Both trust and trustworthiness seem to decrease with insurance. Figures 3 and 4 in Appendix C show a similar pattern, reporting subjects’ likelihoods of trust and trustworthiness for each level of insurance in the three experimental conditions.

**Figure 1: Trust and Trustworthiness by Insurance Level in Jordan**



Regression results (Table 2) show that the negative relationship is only significant for insurance and trustworthiness but not for insurance and trust (Columns 1 and 4). For trust decisions, we find an in-group preference with higher trust rates between principals and agents of the same origin. To examine the relationship between naturally occurring vulnerability and trust/trustworthiness, in Columns 2 and 5, we include dummy variables for the gender and origin of the principal, holding agent characteristics constant. Similar to insurance, the gender and the origin of the principals have no impact on trust. However, consistent with our prediction, principals who belong to the more vulnerable groups, women and Palestinians, receive more trustworthiness.

To further examine the impact of the principal's vulnerability on the agent's trustworthiness, we include interaction variables for the principal's and the agent's gender and origin in Columns 3 and 6. The favorable treatment of Palestinian principals is a main effect while male agents in particular reward female principals with more trustworthiness than male principals, consistent with inequality aversion.

Figure 2 presents the likelihoods of trust and trustworthiness for each insurance level in the control treatment in the United States. Similarly to Jordan, trustworthiness does not increase with insurance. In contrast to Jordan, trust is positively affected by the level of insurance provided.

**Table 2 Marginal Probit Coefficient for Trust and Trustworthiness Regressions in Jordan**

VARIABLES	(1) Trust	(2) Trust	(3) Trust	(4) TW	(5) TW	(6) TW
Principal's Betray Payoff	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.003** (0.001)	-0.003** (0.001)	-0.003** (0.001)
Gender Group Dummy	-0.009 (0.082)	0.053 (0.078)	-0.079 (0.191)	-0.250*** (0.078)	-0.413*** (0.070)	-0.056 (0.120)
Origin Group Dummy	0.191** (0.074)	0.156* (0.086)	0.122 (0.163)	-0.064 (0.108)	-0.210 (0.171)	-0.085 (0.179)
Female Principal		-0.110 (0.148)			0.274** (0.103)	
Female Agent		-0.072 (0.108)			0.171* (0.088)	
Palestinian Principal		0.061 (0.156)			0.139** (0.068)	
Palestinian Agent		-0.008 (0.141)			0.090 (0.144)	
Male Principal & Male Agent			0.137 (0.196)			-0.381*** (0.104)
Male Principal & Female Agent			0.037 (0.234)			-0.101 (0.175)
Female Principal & Female Agent			-0.038 (0.198)			0.028 (0.104)
Jordanian Principal & Jordanian Agent			0.166 (0.163)			-0.100 (0.229)
Jordanian Principal & Palestinian Agent			-0.047 (0.266)			-0.054 (0.161)
Palestinian Principal & Palestinian Agent			0.125 (0.108)			0.111 (0.210)
Constant	-5.728 (.)	-5.838 (.)	-5.777 (.)	7.052 (.)	7.447 (.)	7.626 (.)
Other Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	311	311	311	308	308	308

Marginal Probit coefficients calculated at variable means with clustered robust standard errors by session. Regressing the variables of interest without controlling for other demographic characteristics yield similar results. Subject pairings that involved a principal or an agent from origins other than Jordan and Palestine, 16 subjects in total, were dropped from the regression for consistency. Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Figure 2: Trust and Trustworthiness by Insurance Level in the US**

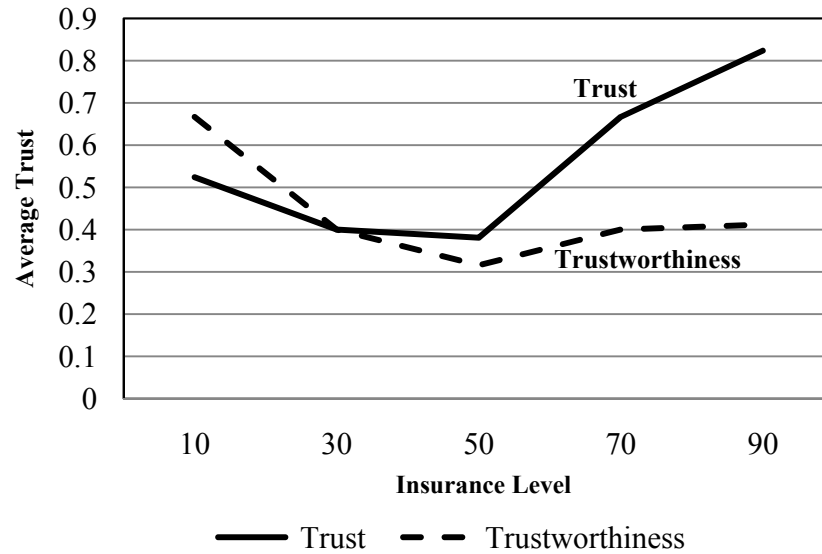


Table 3 shows the regression results for the US alone and combined with the control treatment in Jordan. The regressions do not control for demographic attributes since the attributes that were solicited in the US are not identical to those collected in Jordan (the emphasis was on collecting attributes that would yield identical results in each location). Table 3 shows that the positive effect of insurance on trust (Column 1) and the negative effect on trustworthiness (Column 4) in the US is significant. Combining the US data with the Jordanian data from the control sessions and controlling for country, we find that insurance and location do not have a significant effect on trust (Column 2). On the other hand, trustworthiness for the same combined data is negatively impacted by insurance (significant at the 10% level). Trustworthiness is also significantly affected by the location, with more trustworthiness in Jordan than in the US, (Column 5). Columns 3 and 6 include the country dummy x insurance levels interaction, showing that the positive relationship between insurance and trust is a US phenomenon while the negative relationship between insurance and trustworthiness is relevant in both countries.



**Table 3 Marginal Probit Coefficient for Trust and Trustworthiness Regressions in the US & Jordan**

	(1)	(2)	(3)	(4)	(5)	(6)
Location	US	US & Jor	US & Jor	US	US & Jor	US & Jor
Variables	Trust	Trust	Trust	TW	TW	TW
Principal's Betray Payoff	0.004** (0.002)	0.001 (0.002)	0.004** (0.002)	-0.003* (0.002)	-0.002* (0.001)	-0.003* (0.002)
Jordan Dummy		-0.092 (0.113)	0.199 (0.192)		0.212*** (0.070)	0.130 (0.137)
Jordan Dummy x Principal's Betray Payoff			-0.006** (0.003)			0.002 (0.002)
Other Demographic Controls	No	No	No	No	No	No
Observations	89	189	189	87	188	188

Marginal Probit coefficients calculated at variable means with clustered robust standard errors by session. Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The policy intervention that maximizes trustworthiness is low levels of insurance in both countries. The insurance level that is associated with the highest rate of trustworthiness is X=10 in the US which yields trustworthiness rate of 67%. In Jordan's control group, it is X=30 yielding a trustworthiness level of 77%, with X=70 being close by with trustworthiness level of 75%. These levels are also the money maximizing strategies from the principal's perspective. The highest expected return for US principals occurs at insurance level X=10 which is associated with an expected return of 136.7 points. The money maximizing intervention for Jordanian principals is X=30 with an expected return of 140.8 points.

## 5. Conclusions

This paper examines whether insuring people against the downside risk of trust in case of a betrayal increases their willingness to trust. We first focused on a country where risk management by decreasing the cost of betrayal through insurance or damages is less common, Jordan, and then compared the data with evidence from a country at the opposite end of the spectrum where legal remedies to betrayal are common, the United States. Questions of institutional design are relevant in both countries as they either try to find the right balance between traditional and modern forms of fostering trust or reevaluate trust management in the wake of the financial crisis.

We employed a one-shot binary-choice trust game and measured the effect of insurance by changing the principal's payoffs in case of betrayal, in effect making them more or less vulnerable. Principals were confronted with a complex optimization problem: insurance lowers the cost of betrayal but at the same time, may increase the likelihood that it occurs. The latter behavior is compatible with a model of reciprocity or inequality aversion where trustworthiness rates increase as the difference in the principal's and the agent's betrayal payoffs increases.

We also examined how naturally occurring vulnerability affects trust and trustworthiness by varying the gender and origin of subjects in Jordan. Our Jordanian subjects participated either in a game where they did not know who their counterpart was or one where they knew their counterpart's gender or their origin (Jordanian or Palestinian).

Our results confirmed our prediction: insuring the principal against the agent's betrayal decreased trustworthiness. Similarly, comparing less with more vulnerable

groups in Jordan, that is, men with women, and Jordanians with Palestinians, showed that agents were less likely to reward trust when confronted with a more vulnerable principal, i.e., a man or a Jordanian. With regards to trust, our results differed between the two countries. In Jordan, trust did not respond to the level of insurance. In contrast, in the United States, trust increased with insurance, despite the fact that the institutional environment that would have maximized principals' earnings given agents' behavior would have been the least insured environment with the smallest betrayal payoff.

Our study finds significant cross-regional differences in the responsiveness of trust to changes in the level of insurance, but not in the responsiveness of trustworthiness. Thus, in addition to the agents' social preferences, cultural factors seem to matter. While we cannot exclude cross-regional differences in the ability to anticipate agent behavior with Jordanians more adept at this task than Americans, we suspect that the unfamiliarity and lack of acceptability of damages in Jordan contributed to the lack of trust responsiveness there. Betrayal is normatively wrong and should not be encouraged by compensating the harmed parties for the losses incurred. Similarly, people should not be encouraged to trust lightly as blind risk-taking or speculation is discouraged and in its extreme not compatible with religious and legal doctrine.

Insurance provisions and legal protection against the cost of betrayal are much more common in the US. Our data suggest that in the US, trust may be too responsive to decreases in the cost of betrayal, not taking the impact of insurance on trustworthiness into account. Indeed, such "naïve optimism," or "animal spirits," a term that John Maynard Keynes used to describe how trust is produced, among other things, and that has

inspired a recent book on economic behavior by George Akerlof and Robert Shiller (2009) may well have played a significant role in the current financial crisis.

Our study suggests that decreasing risk when the agent of uncertainty is a person rather than nature may not be an effective strategy for fostering sustainable trust as it also increases the likelihood of betrayal. Social preferences which make trust and trustworthiness possible in a one-shot anonymous interaction such as the one studied in this paper also decrease the effectiveness of an institutional intervention aimed at promoting just such behavior. When designing institutions, both cultural factors as well as social preferences should be taken into account.

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## Appendix A: Experimental Instructions

### English Version of the Experiment Instructions for a Session with Insurance Level

X=10

#### Session 1

#### Form Number 4: Instructions

You are participating in a study in which you will earn some money. The amount will depend on decisions that you and other participants will make. At the end of the study, your earnings (40 points=1 JD) will be added to a show-up fee, and you will be paid in cash at the end of the study.

*How the study is conducted.* The study is conducted anonymously. Participants will be identified only by code numbers and will be unable to associate any decisions with specific people. Participants have been randomly paired into teams consisting of two people: person “A” and person “B”. The letter at the start of your code number determines whether you are person “A” or “B” in your team. There is no communication between you and your counterpart, and your counterpart will never know your true identity, nor will you know theirs. However, you will be able to see demographic data on your counterpart, and your counterpart will see your demographic data.

*What the study is about.* The study seeks to understand how people decide. You and your counterpart form a team, and your decisions will determine how much money you earn. Person “A” has to choose between X and Z. If person “A” chooses X, person “B” does not take any actions. If person “A” chooses Z, person “B” has to choose one of the two alternatives, 1 or 2.

#### Payoff Table

Person “A” chooses	Nature of outcome	Person “B”’s choice	Earnings of Person “A”	Earnings of Person “B”
X	Determined by person “A”	No Choice	100	100
Z	Depends on person “B”’s choice	1	10	350
		2	200	200

Payoff table reads as follows:

- If person “A” chooses X, then person “A” and person “B” will each get 100 points.
- If person “A” chooses Z, and person “B” chooses 1, then person “A” gets 10 points and person “B” gets 350 points.
- If person “A” chooses Z and person “B” chooses 2, then person “A” and person “B” will each get 200 points.

## English Version of the Demographic Questionnaire in Jordan

Your code number is: \_\_\_\_\_

### Session 1

#### Form Number 3: Demographic Questionnaire

Please fill the following questionnaire. This questionnaire is anonymous, participants will be identified only by code numbers, and no one will be able to match respondents to their questionnaire. It is important that you answer these questions truthfully and accurately. Please circle the answer that corresponds to your choice. If more than one answer applies to you, please circle all answers that apply.

A. What is your age:

- |          |          |
|----------|----------|
| 1. 18-22 | 2. 23-26 |
| 3. 27-30 | 4. >30   |

B. What is your nationality:

- |              |                 |
|--------------|-----------------|
| 1. Jordanian | 2. Other: _____ |
|--------------|-----------------|

C. What is your religion:

- |           |              |                 |
|-----------|--------------|-----------------|
| 1. Muslim | 2. Christian | 3. Other: _____ |
|-----------|--------------|-----------------|

D. What is your current education level (E.g.: If you are currently pursuing your Bachelors degree, mark Bachelors).

- |                |              |
|----------------|--------------|
| 1. High School | 2. Bachelors |
| 3. Masters     | 4. Doctoral  |

E. How many languages do you speak other than Arabic (Don't count Arabic):

- |        |                |
|--------|----------------|
| 1. 0   | 2. 1-2         |
| 3. 3-4 | 4. More than 4 |

F. What is the name of your university: \_\_\_\_\_

G. Do you have siblings: 1. Yes 2. No

#### Additional Question for the Gender Treatment:

- What is your gender: 1. Male 2. Female

#### Additional Question for the Origin Treatment:

- What is your origin:  
1. Jordanian 2. Palestinian  
3. Other Arab Origin: \_\_\_\_\_ 3. Other Non-Arab Origin: \_\_\_\_\_



**English Version of the Demographic Questionnaire in the US**

**Your code number is:** \_\_\_\_\_

**Session 1**

**Form Number 3: Demographic Questionnaire**

Please fill the following questionnaire. This questionnaire is anonymous, participants will be identified only by code numbers, and no one will be able to match respondents to their questionnaire. It is important that you answer these questions truthfully and accurately. Please circle the answer that corresponds to your choice. If more than one answer applies to you, please circle all answers that apply.

A. What is your age:

- |          |                 |
|----------|-----------------|
| 1. 18-22 | 2. 23-26        |
| 3. 27-30 | 4. More than 30 |

B. Have you lived in the United States for more than 2 years?:

- |        |       |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|

C. What is your current education level (E.g.: If you are currently pursuing your Bachelors, mark Bachelors).

- |                |              |
|----------------|--------------|
| 1. High School | 2. Bachelors |
| 3. Masters     | 4. Doctoral  |

D. Are you fluent in English?

- |        |       |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|

E. Are you currently a student?

- |        |       |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|

F. Do you have siblings:

- |        |       |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|

**English Version of the Agent's Decision Form for a Session with Insurance Level  
X=10**

**Session 1  
Form Number 6: Decision Form**

**Your code number is:** \_\_\_\_\_

**Session 1  
Decision Form 2**

**IMPORTANT! You will enter here your real decision which will affect how much money you get. Each person in your team will make a decision regarding their move. Person "A" will choose between X and Z. Person "B" will choose between 1 and 2.  
Payoff Table**

Person "A" chooses	Nature of outcome	Person "B"'s choice	Earnings of Person "A"	Earnings of Person "B"
X	Determined by person "A"	No Choice	100	100
Z	Depends on person "B"'s choice	1	10	350
		2	200	200

**(Answer the following question carefully, because YOUR ANSWER will help determine how much money you get. You can only choose one of the choices below.)**

<b>KEY QUESTION:</b>	<b>If your counterpart chooses Z, what do you choose?</b>
<b>(Please circle one answer)</b>	
<b>YOUR ANSWER:</b>	<input type="checkbox"/> 1 <input type="checkbox"/> 2

## Appendix B: Summary Demographic Statistics of the Subjects in Jordan and the US

**Table 4: Summary Demographic Statistics of the Subjects in Jordan**

Demographic Variable	Observation Breakdown			Jordan
<b>Nationality</b>	88% Jordanian	12% Other		93% of population are Jordanians
<b>Gender</b>	63% Male	37% Female		Corresponds to the university's average
<b>Origin</b>	29% Jordanian	63% Palestinian	8% Other	Unofficial: 40-67% of Palestinian origin
<b>Age Distribution</b>	70% between 18-22 yrs	27% between 23-26 yrs	4% older than 26 yrs	Median National Age 23.9 years
<b>Religion</b>	95% Muslim	5% Christian		92% Sunni Muslim 6% Christian
<b>Education</b>	100% Current Undergraduates			
<b>Spoken Languages</b>	49% speak 1 language	50% speak 2-3 languages	1% speak 4-5 languages	
<b>Siblings</b>	99% have siblings	1% no siblings		National average family size: 5.3

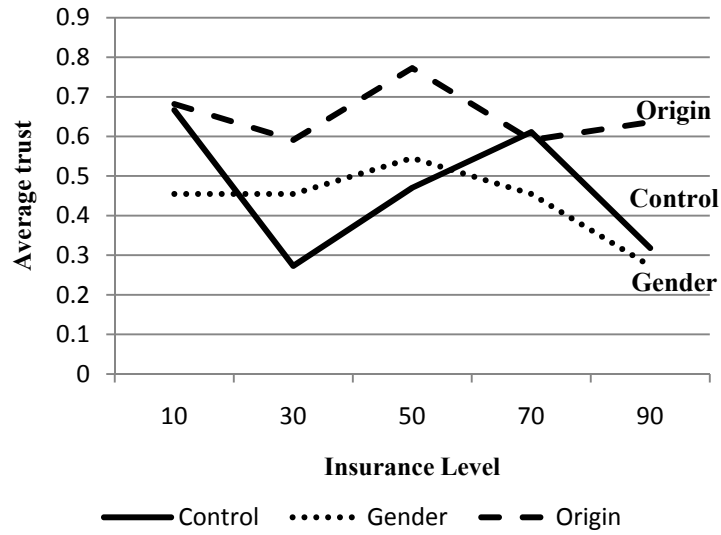
**Table 5: Summary Demographic Statistics of the Subjects in the US**

Demographic Variable	Observation Breakdown			US <sup>7</sup>
<b>English Fluency</b>	100%			Percentage of the population that speaks English less than very well: 8.1%
<b>Age Distribution</b>	94% between 18-22 yrs	4% between 23-26 yrs	2% older than 26 yrs	Median National Age 35.3 years
<b>Currently a student</b>	99% Yes	1% No		
<b>Education</b>	2% high school	97% undergrads	1% Masters	Highest educational attainment of the US population 25 years and over: <ul style="list-style-type: none"> <li>• High school: 31%</li> <li>• Some college no degree: 17%</li> <li>• Associate degree: 9%</li> <li>• Bachelor's: 19%</li> <li>• Graduate degree: 11%</li> </ul>
<b>Lived in the US more than 2 yrs</b>	97% Yes	3% No		
<b>Siblings</b>	87% Yes	13% No		National average family size: 3.1

<sup>7</sup> US Census 2009, US Census Bureau, URL: <http://www.census.gov/population/socdemo/education/cps2009/Table1-01.xls>.

## Appendix A

### Figure 3 Trust by Insurance Level Within Each Treatment



### Figure 4 Trustworthiness by Insurance Level Within Each Treatment

