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AGRICULTURE IN AN INTERCONNECTED WORLD



Dissecting trust: Evidence From a Field Experiment in Rural Cameroon

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Niccolò F. Meriggi ^{1*}
Koen Leuvelde²

Abstract

Trust plays a key role in promoting cooperation, exchanges, and interactions among individuals and therefore it is believed to foster economic and societal development. Sender's behaviour in the popular "investment game" (Berg et al. 1995) is widely employed to measure trust among individuals, but recent economic literature has cast doubts on the accuracy of this measure of trust. These studies, however, were mostly conducted in controlled environments, having university students as subject pools. We played the "investment game" with 3320 rural households from 200 villages in the Adamawa region of Cameroon, recording for each participant his expectations of return on the endowment shared as first mover. In addition, participants played two additional games obtained by separating the "investment game" into two sub-games, "triple dictator game" and "reverse triple dictator game". The latter two games were used to measure participants' altruism and distributional preferences. All participants were randomly assigned to two treatments with different secrecy levels to create exogenous variation in social pressure, and measure the effect of social norms on behaviour in investment game. We use behaviour observed in the sub games to test whether senders behaviour in the investment game only measures trust (and therefore a belief in someone else's trustworthiness), and whether trustworthiness in turn is a reciprocation of kindness with kindness, or unkindness with unkindness. We control for risk preferences and other demographics, and find that senders behaviour in the investment game measures mostly trust, but it is not an accurate measure of trust.

¹Development Economics Group, Wageningen University

²Agricultural Economics and Policy Group, Wageningen University

*Corresponding author. Email: niccolo.meriggi@wur.nl

Introduction

Trust plays a paramount role in daily life and in most human interactions. For this reason, trust has received much attention by scholars from different disciplines, ranging from evolutionary biology to sociology, and from political sciences to economics. Kenneth Arrow was among the first economists to acknowledge the importance of trust in lowering transaction costs, and enhancing production by the derived higher efficiency (Arrow 1974). In the last couple of decades, economists have found that trust, and particularly levels of trust, play an important role in economic growth (Knack and Keefer 1997), and other phenomena affecting economic growth like investment levels (Zak and Knack 2001), firm size (La Porta et al. 1997; Bloom, Sadun, and Van Reenen 2012), cooperation (Gächter, Herrmann, and Thöni 2004), financial development (Guiso, Sapienza, and Zingales 2004; Guiso, Sapienza, and Zingales 2008), and management of common resources (Bouma, Bulte, and Van Soest 2008), among others.

Most formal definitions of trust revolve around the expectations of one individual (A) on the probability of another individual (B) behaving in a manner that is beneficial to A. When A values this probability of B performing an action beneficial to A high enough to engage in some cooperation with B, then we say that individual A trusts individual B (Gambetta 2000). Based on this definition, we can say that trust is purely an expectation of trustworthiness, and this seems to be the shared view in many disciplines (Rotter 1980; Yamagishi and Yamagishi 1994; Cook, Hardin, and Levi 2007; Gambetta 2000). Therefore, the behaviour of first movers in the investment game proposed by Berg et al. (1995) should only depend on first mover's expectations about the amount returned by the second movers. These views have recently been challenged by several authors who have shown that only a small fraction of the money sent by first movers, and returned by second movers, are due to expectations of trustworthiness or reciprocity. Notable examples for our study include Cox (2004), who uses a triadic design to disentangle trusting and reciprocating behaviour from other regarding preferences and Ashraf et al. (2006), who ran investment- and dictator games using a within subject design to study what motivates people to be trusting or trustworthy in three different countries. Another factor found to be correlated with behaviour of the first mover are his or her individual risk preferences (Karlan 2005; Schechter 2007; Sapienza, Toldra-Simats, and Zingales 2013).

The vast majority of studies cited above have used what has come to be labelled a "WEIRD" (Western Educated Industrialized Rich and Democratic). However, findings from such settings might not apply world-wide. Subjects in different cultural settings will have different constructs of trust, and thus behave in a different manner (Henrich, Heine, and Norenzayan 2010). The constituent components of WEIRD might not be the relevant factors. Moreover, while some of these vary within LDCs, some obviously do not (one country will always be either Western or non-Western, democratic or non-democratic). We therefore focus on three aspects: education, market access, and religious beliefs. These three factors vary substantially in Less Developed Countries (LDCs), leading to subjects from these countries to differ greatly in the similarity to their WEIRD peers. This paper aims to exploit this variation to assess how different constituent components of WEIRD-ness affect trusting behaviour in the Investment Game. Given our large sample size of 3320 households in a rural setting in Cameroon we are able to measure how market access, religious belief and education are associated with different behavioural responses in the trust game. In particular we examine the responsiveness of participants to their expectations. We are

cautious about basing causal claims from our findings, as there is ample scope for e.g. self-selection. However, our design will allow for better understanding as to what really motivates people to engage in trust interactions. Given the vast body of literature linking trust to efficiency, growth, social capital, cooperation, and coordination (Ashraf et al., 2006; Fukuyama, 1996; Knack & Keefer, 1997; Kramer & Tyler, 1996; La Porta et al., 1997; Putnam, 2000; Sapienza et al., 2013; Slemrod & Katuščák, 2005; Zak & Knack, 2001), a better understanding of what motivates people to trust one another can be of extraordinary importance for policy.

This paper is structured as follows: first we introduce our experimental design, followed by our conceptual framework. The following section describes our data, followed by the results and a conclusion.

Experimental Design

Our sample consists of 3320 household heads from 199 different villages situated in the Adamawa region of Northern Cameroon. Villages were selected from the 817 enumeration areas (EAs)¹ in Adamawa used for the 2005 General Population and Habitat Census (“Recensement Général de la Population et de l’Habitat”, RGPH) provided by the Cameroonian National Institute of Statistics (“Institut National de la Statistique”, INS) and the Census Bureau Center for Population Studies (“Bureau de Centre de Recensement des Etudes sur la Population”, BUCREP). We employed a stratified randomization on EAs size and location (urban or rural). The research was implemented as part of a larger study on the adoption of biodigesters in rural Adamawa commissioned by SNV, a Dutch development organization. For this reason, research participants consisted of those meeting eligibility criteria for the biodigester program, and randomly selected villagers.

The selected households were visited between June and July 2013 for a baseline consisting of a household questionnaire. Three months later we visited the same households to gather information on households’ risk preferences, social preferences, distributive preferences and trust in others, as well as trust in village institutions. Households were visited at their homes. In the Adamawa region of Cameroon, households are mostly male headed (92% of our sample). The heads of the households were invited to participate in the research activity. After some general information on the household was collected, the household head was invited to play several games, after which a short survey was carried out. Since many participants are illiterate, all explanations of the games were conducted orally by enumeration staff. Before each game, participants were reminded that they would only be paid for one of the games they were about to play, and that the game they were to be paid for would be determined by draw at the end of our stay at the village. They were told that their choices would always remain anonymous.

In the first game played with the household, head risk preferences were elicited and measured following the procedure proposed by Holt and Laury (2002), where subjects were presented with a set of ten paired lotteries in Table 1. Preferences of the head were collected (the husband is always considered the

¹ Each enumeration area contains between 200 and 250 households and therefore can be bigger or smaller than a village.

head of the household in Adamawa), and if applicable his wife or, in the case of a polygamous household, one of his wives make a joint decision with the husband. The wives were always interviewed by female enumerators to conform to local customs.

Table 1: Risk game lotteries. XAF stands for the CFA franc, the currency used in Cameroon.

Option A	Option B	Expected Payoff Difference
1/10 of 2,000 XAF, 9/10 of 1,600 XAF	1/10 of 3,850 XAF, 9/10 of 100 XAF	XAF 1170
2/10 of 2,000 XAF, 8/10 of 1,600 XAF	2/10 of 3,850 XAF, 8/10 of 100 XAF	XAF 830
3/10 of 2,000 XAF, 7/10 of 1,600 XAF	3/10 of 3,850 XAF, 7/10 of 100 XAF	XAF 500
4/10 of 2,000 XAF, 6/10 of 1,600 XAF	4/10 of 3,850 XAF, 6/10 of 100 XAF	XAF 160
5/10 of 2,000 XAF, 5/10 of 1,600 XAF	5/10 of 3,850 XAF, 5/10 of 100 XAF	XAF -180
6/10 of 2,000 XAF, 4/10 of 1,600 XAF	6/10 of 3,850 XAF, 4/10 of 100 XAF	XAF -510
7/10 of 2,000 XAF, 3/10 of 1,600 XAF	7/10 of 3,850 XAF, 3/10 of 100 XAF	XAF -850
8/10 of 2,000 XAF, 2/10 of 1,600 XAF	8/10 of 3,850 XAF, 2/10 of 100 XAF	XAF -1180
9/10 of 2,000 XAF, 1/10 of 1,600 XAF	9/10 of 3,850 XAF, 1/10 of 100 XAF	XAF -1152
10/10 of 2,000 XAF, 0/10 of 1,600 XAF	10/10 of 3,850 XAF, 0/10 of 100 XAF	XAF -1185

After the risk game subjects played additional games to measure trust and its constituent components (other regarding preferences and trust): a standard Triple Dictator Game (TDG) and an Investment Game (IG).

During the TDG, all heads of the household played the role of the dictator. Here, participants were endowed with 10 experimental tokens, each worth 100 XAF. Participants were then asked to allocate a fixed endowment E^{TDG} between himself and another recipient from the village who did not receive any endowment. Each token sent to the recipient X^{TDG} was then tripled by the experimenter. Therefore, the dictator's payoff would correspond to $E^{TDG} - X^{TDG}$, and the recipient's payoff would be equal to $3X^{TDG}$. All responses were recorded in double copy. One copy was called version A and the other copy was called version B. Respondents were informed that based on random drawing, they could either be the dictator or the recipient. In case respondents were dictators, their payoff would be determined by the amount they sent during the TDG ($E^{TDG} - X^{TDG}$). If they were recipients, they had to draw an envelope containing the responses from another participant registered in version B; here the payoff would correspond to the triple the amount sent by the other participant as indicated in version B. Before commencing the game, enumerators made sure the participants understood all this using a warm-up game and a checklist consisting of items designed to probe comprehension.

After the TDG, all participants were asked to participate in an investment game based on Berg et al. (1995), both as first movers (trustor) and as second movers (trustee). Similarly to TDG, trustors were asked to share their endowment E^{IG} (consisting of ten experimental tokens each worth 100 XAF each) with another recipient in the village, the trustee. The amount sent by the trustor X^{IG} , would be tripled by the experimenter and the trustee would receive $3X^{IG}$. The trustee could then return any amount of money Y^{IG} between 0 and $3X^{IG}$ to the trustor. After indicating how much money they would send to the trustee, participants were asked to indicate how much they expected back, and then they would participate in the game as trustees. Similar to Ashraf et al. (2006), we used the strategy method where second movers had to decide on a contingent action for every possible amount sent by the first mover.

Similarly to the TDG, responses from the participants were recorded in double copy (version A and version B), and a random draw after all sessions would determine whether participants were paid according to their decision as trustors or trustees. In either case, participants had to draw an envelope containing version B with the responses of another participant. In case the participant was a trustor, his payoff would be determined by subtracting the amount sent X^{IG} from his endowment E^{IG} , and adding the amount returned by the trustee for the corresponding situation Y^{IG} (recorded on version B from drawn envelope). In case the participant was a trustee instead, his payoff would be determined by three times the amount sent by another trustor in the village and recorded on version B in the drawn envelope, minus the amount the trustee returns for the corresponding situation. Therefore the payoff for trustor corresponds to $E^{IG} - X^{IG} + Y^{IG}$, and the payoff of the trustee corresponds to $3X^{IG} - Y^{IG}$.

Games were followed by a light survey on households' perceptions on general topics like gender issues and religion, and two experimental auctions involving pico-solar lamps and biodigesters.

At the end of our visit to the village (one to three days after the completion of the session), respondents were asked to meet us in a common space (normally a public building with the possibility to have a space with privacy for payments), where they were paid based on one randomly selected game.

Conceptual framework

To explain what motivates people to engage in trusting behaviour, we need to disentangle the different mechanisms underlying such behaviours. Following previous literature (Ashraf et al., 2006), we use the amount sent in the investment game X^{IG} as our measure of trusting behaviour. We use the fraction of money trustors expected in return $E(Y^{IG}/3X^{IG})$, as trustors' expectation on trustees' levels of trustworthiness. Pure altruism is measured as the amount shared during the Triple Dictator Game X^{TDG} , and distributional preferences are measured as the amount shared during the Reverse Triple Dictator Game X^{rTDG} . This relationship is described by the following equation:

$$X^{IG} = \alpha + \beta_1 E(Y^{IG}/3X^{IG}) + \beta_2 X^{TDG} + \beta_4 \text{Controls}$$

Following Ashraf et al. (2006), we test the following hypothesis for Eq.1:

H1: Trust is only based on unconditional expectations of trustworthiness.

We accept H1 if our trust indicator X^{IG} is related to the amount trustors expect trustees to return $E(Y^{IG}/3X^{IG})$, but not to our indicator of pure altruism X^{TDG} . If altruism as measured by X^{TDG} matters, we expect it to explain a smaller share of variation in X^{IG} than $E(Y^{IG}/3X^{IG})$.

However, we do not expect all individuals to respond to their expectations in quite the same manner. There is evidence that market access makes people behave more pro-social: people who live in market economies behave more pro-socially than those who do not (Henrich et al. 2005; Henrich et al. 2010). Al-Ubaydli et al. (2013) suggest that for the Investment Game, market priming increases trusting behaviour. One possible mechanism cited in this study is that market participation provides repeated opportunities for interaction with strangers, leading to a lower perceived risk to engaging in trusting

behaviour. In order to adjust equation 1 to take this into account, we add an indicator for having a market in the town, and add an interaction term of this indicator and expectations:

$$X^{IG} = \alpha + \beta_1^* E(Y^{IG}/3X^{IG}) + \beta_2^* X^{TDG} + \beta_3 * MRKT + \beta_4 * E(Y^{IG}/3X^{IG}) * MRKT + \beta_4^* Controls$$

We hypothesize β_4 to be positive; indicating that market access is correlated to an increased response to expectations. If there is no migration in the area, living close to a market is exogenous, and this effect can be interpreted as a causal effect. While there certainly is not a lot of migration, there is some mobility, and thus we cannot exclude the possibility that any effect is driven by a selection effect, rather than the causal effect of market access on trusting behaviour. However, our aim in this study is not to show this causal effect. The aim is to investigate how behaviour in an Investment Game changes for a non-WEIRD subject pool. Participant with no market access are less WEIRD (i.e. less like typical grad students) than those who do have regular access to a market.

Two other dimensions in which the participants to our research differ in different degrees from a Western subject pool are religion and education. In terms of religion, as noted above, the predominant religion in the region is Islam. This is important in the context of a trust game, as Islam is associated with strong norms related to economic behaviour. The idealized Muslim counterpart to *Homo Economicus*, *Homo Islamicus* “bases his decisions not his personal interest but on that of society at large” (Kuran 1983). We thus expect that if we treat religiosity the same way as we did market access in equation 2, we would find a negative coefficient for the interaction term between expected return and religiosity.

Religiosity is a highly multi-faceted phenomenon, which is unlikely to be captured by a single indicator. We therefore follow Tiliouine, Cummins, and Davern (2009) in constructing a scale for Islamic religiosity. This means that we can only study Muslim households, and not the Christian minority for this analysis. This religiosity scale starts with a series of questions on behaviours and beliefs about the role of Islam in the life of our participants. We then use Principal Component Factor Analysis to reduce the number of possible indicators to a manageable number.

Note that we do not aim to address the question whether there is a relationship between morality, pro-sociality and religion (see e.g. Shariff and Norenzayan 2007), rather we study whether the behavioural response to expectations differs with certain aspects of religiosity.

Similar concerns exist regarding education. We hypothesize education to positively affect responsiveness to expectations. It could be that any results we find here are driven by the fact that educated people are better able to comprehend the games played. We attenuate this concern by testing our participants’ comprehension of the games, and only proceeding when it is clear that they understand the games played. This means that all participants understand the process of the game.

Based on this we formulate the following hypotheses:

H2: Market access is correlated with greater responsiveness to expectations

We accept H2 if X^{IG} is related to the interaction term between market access (**MRKT**) and the amount trustors expect in return from trustees $E(Y^{IG}/3X^{IG})$, and the coefficient is positive.

H3: Increased religiosity is correlated with smaller responsiveness to expectations

We accept H3 if X^{IG} is related to the interaction term between religiosity (**RELI**) and the amount trustors expect in return from trustees $E(Y^{IG}/3X^{IG})$, and the coefficient negative.

H4: Having an education is correlated with greater responsiveness to expectations

We accept H4 if X^{IG} is related to the interaction term between education (**EDU**) and the amount trustors expect in return from trustees $E(Y^{IG}/3X^{IG})$, and the coefficient positive.

This section will briefly discuss some descriptive statistics related to the outcomes of our experimental games, before moving on to a more detailed analysis of the data in light of the hypotheses described above.

Descriptive Statistics

Investment game

When asked to participate in the TDG (without any expectations of reciprocity) participants on average offer 3.44 of their 10 tokens to their counterpart. In the IG 3.24 tokens are shared on average by the first mover. Figure 1 and Figure 2 show the distribution of these choices. Of particular importance here is the fact that the amount sent in the IG is lower than the amount sent in the TDG, and the difference is significant at the 1% level. This is highly counterintuitive, as TDG giving is expected to be based on both altruism and expectations of return (see equation 1). Since these expectations are 0 by construct in the TDG, and positive in the IG (on average 3.63 tokens are expected in return), it follows that contributions in the IG should be higher than the contribution in the TDG. Since the average amount sent is lower than the average amount expected in return, on average our participants expect to come out ahead by sending any positive amount to the second mover. The actual amount returned is very close to the expected amount (3.60, higher than the amount sent), which makes this behavior puzzling. However, in light of Islamic morals described above, where people base their decisions on the greater good and not personal interest, it is not surprising that people do not respond to expectations of return. The interactions between religion and education will be explored further below.

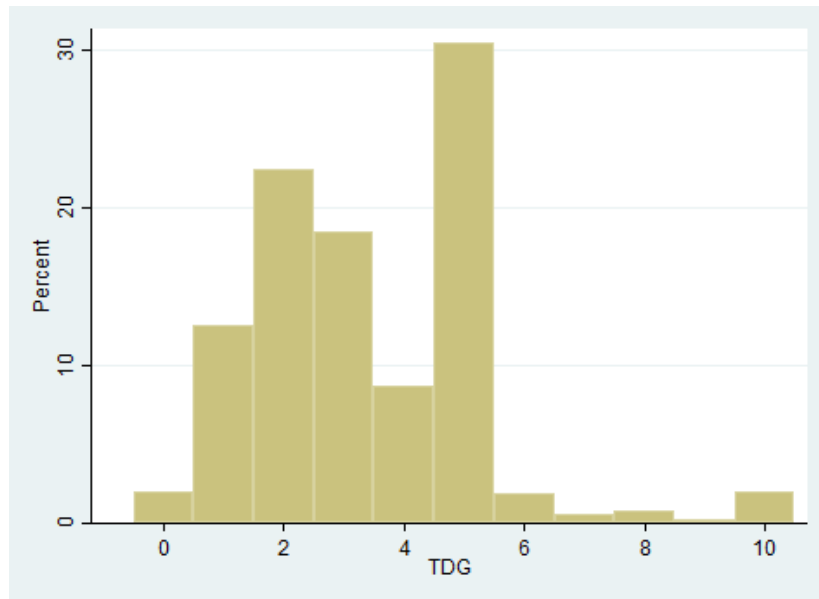


Figure 1: Histogram of amounts sent in the TDG

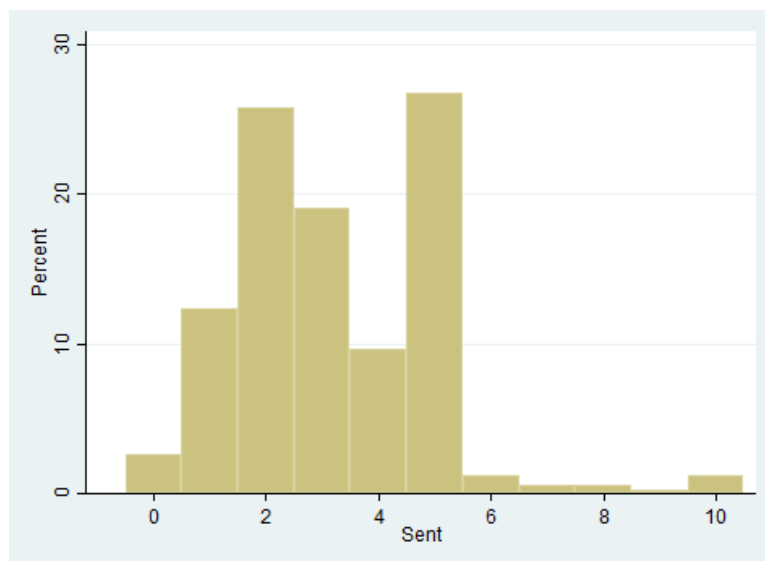


Figure 2: Histogram of amounts sent by IG First movers

Religiosity

Measuring religiosity poses two core problems in this context. First, the practices and behaviours related to religiosity differ between religions. Second, even within a religion, religiosity is not a one dimensional concept, but can encompass many factors. We address the first concern by limiting our analysis to the dominant religion in the area: Islam. The second concern we address by following Tiliouine, Cummins, and Davern (2009), who construct a religiosity scale for Islam based on a series of questions about practices, behaviours and the importance given to these religious concepts in daily live. In order to reduce the number variables to an analytically useful set of indicators we perform a principal component factor analysis, extracting the top four components (those with a eigenvalue greater than 1). The results from this factor analysis, and the exact specification of the questions can be found in the appendix. All questions were answered using a five point likert scale, with 1 being most frequent/important. To facilitate interpretation of the results, these have been recoded to 5 being the most frequent/important. The correlation matrix underlying the principal factor analysis has been created using polychoric correlation, due to the ordinal nature of the data.

The questions with high factor loading for the first factor all matter for the importance in daily life that is attached to religious concepts such as Zakat and Sadakat (charity) and the Ramadan. We label the factor "Religious Beliefs". The second factor all relate to practices that go beyond the duty of a "regular" Muslim, such as extra prayers and fasting outside the Ramadan. This factor is therefore called "Devotion". The third factor has high loadings for late prayers and prayers outside the mosque, indicating "Religious Compensation". The final factor is related to everyday practices such as Mosque visits, and hence is labelled "Religious Practice".

Results

In Table 2 we present the results of a series of regressions of the amount sent in the trust game on a set of explanatory variables. In column 1 we see that behavior in the TDG is strongly correlated to behavior in the IG. For each token sent in the TDG, 0.427 tokens are sent in the IG. This effect is significant at the 1% level. Behaviour in the Holt & Laury risk game (column 2), on the other hand, is not correlated to amount sent in the IG. The coefficient is tiny and insignificant². From column 3 expected return appears to be a strong predictor of the amount sent. If the fraction increases by 1 (which is the maximum extent, going from zero expectations, to everything being returned) the amount sent increases by almost 1. However, when we compare the r-squared of column 1 with column 3, we see that expectations do not really predict a large amount of the variation. This is not in line with previous literature. Ashraf, Bohnet, and Piankov (2006) for example find that a model with expectation but not unconditional kindness (as measured by the TDG) explains 58% of the variation in sending behavior, while vice versa only 25% of the variation is explained.. Column 3 reports a full specification of the model. All this reinforces the picture

² Note that we included participants with non-consistent choices. The non-result is robust to only including consistent preferences, but this would only reduce our power.

painted before that people do not appear to respond as strongly to their expectations of return as we have come to expect based on other experimental data.

Table 2

	(1) Sent	(2) Sent	(3) Sent	(4) Sent
TDG	0.427*** (18.89)			0.418*** (18.37)
Risk: 1st switch point		-0.00733 (-0.77)		-0.00359 (-0.43)
Frac. Expected			0.999*** (4.69)	0.673*** (3.69)
Constant	1.494*** (12.78)	2.965*** (25.18)	2.566*** (19.19)	1.302*** (9.17)
Add. Controls	Yes	Yes	Yes	Yes
N	2525	2521	2526	2521
Adj. R-Square	0.21	0.01	0.02	0.22

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Standard errors clustered at the village level; Additional controls include: village size, household size, Muslim, assets, being the village leader.

Result 1: Altruism explains more of the variation in trusting behaviour than expectations.

Table 3 reports the results of our regressions to find what could be driving these counter-intuitive results. These regressions are in line with equation 2, aiming to find heterogeneity in the extent to which people respond to their expectations. Column 1 reports the effect of market participation. The level effect is negative, i.e. people in market village send less to the second mover. However, the interaction term with expectations is significantly positive, indicating that people respond more strongly to their expectations in market villages.

Result 2: Market access is associated with an increased responsiveness to expectations.

Column 2 includes the Principal Components of our religiosity scale. Note that the N for this column is lower than for columns 1 and 3 as only Muslim respondents are included here, since our measure of religiosity is not suited for other religions. Four such components are identified: Beliefs, devotion, compensation and practice. Among them, only religious practice (that is going to the mosque etc.) is significantly correlated to the amount sent: people who attend the mosque more often, send more to their peers. However, among the interaction terms with expectations, religious devotion and practice enter negatively; people who engage in extra prayers, go to the mosque more often, respond less strongly to their expectations. These findings are in line with the theory outlined above: religiosity inhibits the extent to which people act on their expectations.

Result 3: Islamic religious beliefs are associated with a decreased responsiveness to expectations

Column 3 includes an indicator variable for having attended any form of education and its interaction term with expectations, in a fashion that is similar to columns 1 and 2. Here we find that while having had an education is negatively correlated with the amount sent in the IG, the interaction term is strongly positive.

Result 3: Education is associated with an increased responsiveness to expectations

Table 3: Results from heterogeneity analysis

	(1) Sent	(2) Sent	(3) Sent	(4) Sent
TDG	0.419*** (18.46)	0.424*** (15.83)	0.417*** (18.41)	0.424*** (16.02)
Risk: 1st switch point	-0.00310 (-0.37)	0.00254 (0.28)	-0.00338 (-0.40)	0.00354 (0.39)
Frac. Expected	0.288 (0.94)	-2.088 (-0.81)	0.293 (1.34)	-4.042 (-1.53)
Market in village	-0.305* (-1.96)			-0.337** (-2.04)
Exp. x Market	0.650* (1.75)			0.761** (2.01)
Religious Beliefs		-0.244 (-1.48)		-0.312* (-1.85)
Religious Devotion		0.0753 (1.30)		0.0625 (1.09)
Religious Compensation		-0.0760 (-0.85)		-0.0917 (-1.01)
Religious Practice		0.196** (2.48)		0.200*** (2.65)
Exp. x Rel. Beliefs		0.673 (1.65)		0.830** (2.02)
Exp. x Devotion		-0.259* (-1.96)		-0.220 (-1.01)

			(-1.71)	(-1.49)
Exp. x Rel. Comp.		0.192	(0.90)	0.223 (1.03)
Exp. x Rel. Practice		-0.319*	(-1.66)	-0.330* (-1.79)
Educated			-0.368** (-2.51)	-0.371** (-2.35)
Exp. x Education			0.914** (2.54)	1.032*** (2.80)
Constant	1.456*** (8.63)	2.222** (2.07)	1.487*** (9.10)	3.117*** (2.73)
Add. Controls	Yes	Yes	Yes	Yes
N	2521	2019	2521	2019
Adj. R-Square	0.22	0.23	0.22	0.24

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Standard errors clustered at the village level; Additional controls include: village size, household size, Muslim, assets, being the village leader.

Discussion and Conclusions

Social capital is receiving increasing attention in economic theories and analysis, and trust is at the very core of the theory on social capital. Therefore, an increasing amount of empirical work is focusing on the role of trust in economics.

If we want to use indicators of trust to explain economic behaviours outside of the labs, however, we first need to ask ourselves whether we are really measuring trust, and if what participants outside of the lab think they are playing when they play an investment game.

These questions motivated our study, where we dissect the investment game inspired by Berg et al. by measuring altruism and expectations of possible return separately. We use behaviour observed in the sub games to test whether senders behaviour in the investment game really only measures trust (and therefore a belief in someone else's trustworthiness), We control for risk preferences and other demographics, and find that altruism explains a large part of the variation in amounts sent by the first movers in the Investment Game. Expectations of tokens returned by the second mover, which is the common conceptualization of trust, plays a secondary role. Moreover, the effect of expectations varies with religion, market integration and education. The more market integrated, less religious and more educated our participants are, the more they play the investment game as the subjects commonly used: students at Western universities.

These results are highly significant for researchers examining trust in cross-cultural settings, or those aiming to explain development outcomes using trust as measured by the standard trust game. The amounts sent by the first movers are correlated differently to trust as it is commonly defined for different participants to these games. Ignoring the role played by these factors in participants' motivations for sharing or returning would lead to unreliable measures of trust.

All this evidence suggests that several factors other than just expectations of trustworthiness, or reciprocity affect the decisions of how much to share or how much to return in an investment game. Many of these factors are not observable in the lab, where the dynamics of private versus public gains, or having more or less wives would have no effect. While taking the trust game out of the lab and into the field does yield useful insight in the dynamics of trust in a real world settings, and thus this study can thus not be labelled an autopsy as the trust game is not dead

References

- Al-Ubaydli, Omar, Daniel Houser, John Nye, Maria Pia Paganelli, and Xiaofei Sophia Pan. 2013. "The Causal Effect of Market Priming on Trust: An Experimental Investigation Using Randomized Control." *PLoS ONE* 8 (3): 1–8. doi:10.1371/journal.pone.0055968.
- Arrow, K J. 1974. *The Limits of Organization*. The Fels Lectures on Public Policy analysis;1970-1971. New York: Norton W.W. and Co.
- Ashraf, Nava, Iris Bohnet, and Nikita Piankov. 2006. "Decomposing Trust and Trustworthiness." *Experimental Economics* 9 (3) (September): 193–208. doi:10.1007/s10683-006-9122-4.
- Berg, Joyce, John Dickhaut, and Kevin McCabe. 1995. "Trust, Reciprocity, and Social History." *Games and Economic Behavior* 10 (1) (July): 122–142. doi:10.1006/game.1995.1027.
- Bloom, Nicholas, Raffaella Sadun, and John Van Reenen. 2012. "The Organization of Firms across Countries." *Quarterly Journal of Economics* 127: 1663–1705. doi:10.1093/qje/qje029.
- Bouma, Jetske, Erwin Bulte, and Daan Van Soest. 2008. "Trust and Cooperation: Social Capital and Community Resource Management." *Journal of Environmental Economics and Management* 56: 155–166. doi:10.1016/j.jeem.2008.03.004.
- Cook, Karen S, Russell Hardin, and Margaret Levi. 2007. "Cooperation without Law or Trust." In *Contemporary Sociological Theory*, 125–138.
- Cox, James C. 2004. "How to Identify Trust and Reciprocity." *Games and Economic Behavior* 46 (2) (February): 260–281. doi:10.1016/S0899-8256(03)00119-2.
- Fukuyama, F. 1996. *Trust: The Social Virtues and the Creation of Prosperity*. New York [etc.]: Free Press [etc.].
- Gächter, Simon, Benedikt Herrmann, and Christian Thöni. 2004. "Trust, Voluntary Cooperation, and Socio-Economic Background: Survey and Experimental Evidence." *Journal of Economic Behavior and Organization* 55: 505–531. doi:10.1016/j.jebo.2003.11.006.
- Gambetta, Diego. 2000. "Can We Trust Trust?" *Trust: Making and Breaking Cooperative Relations*: 17. doi:10.1.1.24.5695.
- Guiso, Luigi, Paola Sapienza, and Luigi Zingales. 2004. "The Role of Social Capital in Financial Development." *American Economic Review*. doi:10.1257/0002828041464498.
- . 2008. "Trusting the Stock Market." *Journal of Finance* 63: 2557–2600. doi:10.1111/j.1540-6261.2008.01408.x.
- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Richard McElreath, Michael Alvard, et al. 2005. "'Economic Man' in Cross-Cultural Perspective: Behavioral Experiments in 15 Small-Scale Societies." *Behavioral and Brain Sciences* 28 (6): 795–815.
- Henrich, Joseph, Jean Ensminger, Richard McElreath, Abigail Barr, Clark Barrett, Alexander Bolyanatz, Juan Camilo Cardenas, et al. 2010. "Markets, Religion, Community Size and the Evolution of Fairness and Punishment." *Science* 327 (5972): 1480–1485. doi:10.1126/science.1182238.
- Henrich, Joseph, Steven J Heine, and Ara Norenzayan. 2010. "Most People Are Not WEIRD." *Nature* 466 (29): 29. doi:10.1017/S0140525X0999152X.
- Holt, Charles A, and Susan K Laury. 2002. "Risk Aversion and Incentive Effects." *American Economic Review* 92 (5): 1644–1655.

- Karlan, Dean S. 2005. "Using Experimental Economics to Measure Social Capital and Predict Financial Decisions." *American Economic Review*. doi:10.1257/000282805775014407.
- Knack, Stephen, and Philip Keefer. 1997. "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation." *The Quarterly Journal of Economics* 112: 1251–1288. doi:10.1162/003355300555475.
- Kramer, R M, and T R Tyler. 1996. *Trust in Organizations : Frontiers of Theory and Research*. Thousand Oaks [etc.]: Sage.
- Kuran, Timur. 1983. "Behavioral Norms in the Islamic Doctrine of Economics: A Comment." *Journal of Economic Behavior & Organization* 4 (4): 353–379. doi:10.1016/0167-2681(94)00029-E.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny. 1997. "Trust in Large Organizations." *American Economic Review*. doi:10.1126/science.151.3712.867-a.
- Putnam, Robert D. 2000. *Bowling Alone: The Collapse and Revival of American Community*. Simon and Schuster.
- Rotter, Julian B. 1980. "Interpersonal Trust, Trustworthiness, and Gullibility." *American Psychologist*. doi:10.1037/0003-066X.35.1.1.
- Sapienza, Paola, Anna Toldra-Simats, and Luigi Zingales. 2013. "Understanding Trust." *Economic Journal* 123: 1313–1332. doi:10.1111/eoj.12036.
- Schechter, Laura. 2007. "Traditional Trust Measurement and the Risk Confound: An Experiment in Rural Paraguay." *Journal of Economic Behavior and Organization* 62: 272–292. doi:10.1016/j.jebo.2005.03.006.
- Shariff, Azim F., and Ara Norenzayan. 2007. "God Is Watching You: Priming God Concepts Increases Prosocial Behavior in an Anonymous Economic Game." *Psychological Science* 18 (9): 803–809.
- Slemrod, Joel, and Peter Katuščák. 2005. "Do Trust and Trustworthiness Pay Off?" *Journal of Human Resources* 40 (3): 621–646.
- Tiliouine, Habib, Robert a. Cummins, and Melanie Davern. 2009. "Islamic Religiosity, Subjective Well-Being, and Health." *Mental Health, Religion & Culture* 12 (1) (January): 55–74. doi:10.1080/13674670802118099.
- Yamagishi, Toshio, and Midori Yamagishi. 1994. "Trust and Commitment in the United States and Japan." *Motivation and Emotion* 18: 129–166. doi:10.1007/BF02249397.
- Zak, Paul J, and Stephen Knack. 2001. "Trust and Growth." *The Economic Journal* 111 (470) (March): 295–321. doi:10.1111/1468-0297.00609.

APPENDIX

(obs=2048)

Factor analysis/correlation Number of obs = 2048
Method: principal-component factors Retained factors = 4
Rotation: (unrotated) Number of params = 66

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	5.06820	2.48223	0.2816	0.2816
Factor2	2.58598	1.08949	0.1437	0.4252
Factor3	1.49649	0.29397	0.0831	0.5084
Factor4	1.20253	0.22084	0.0668	0.5752
Factor5	0.98168	0.04479	0.0545	0.6297
Factor6	0.93689	0.16346	0.0520	0.6818
Factor7	0.77344	0.02217	0.0430	0.7247
Factor8	0.75126	0.12030	0.0417	0.7665
Factor9	0.63096	0.03048	0.0351	0.8015
Factor10	0.60048	0.05358	0.0334	0.8349
Factor11	0.54689	0.04267	0.0304	0.8653
Factor12	0.50422	0.05443	0.0280	0.8933
Factor13	0.44979	0.08332	0.0250	0.9183
Factor14	0.36647	0.02575	0.0204	0.9386
Factor15	0.34072	0.03056	0.0189	0.9576
Factor16	0.31015	0.05290	0.0172	0.9748
Factor17	0.25725	0.06065	0.0143	0.9891
Factor18	0.19660	.	0.0109	1.0000

LR test: independent vs. saturated: $\chi^2(153) = 1.4e+04$ Prob> $\chi^2 = 0.0000$

Factor loadings (pattern matrix) and unique variances

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Variable  Factor1  Factor2  Factor3  Factor4  Uniqueness
-----+-----+-----
qh101a   0.4942   0.4493  -0.3448   0.2031   0.3938
qh102b  -0.2857  -0.0779   0.7771  -0.0907   0.3003
qh102c   0.4138   0.5785   0.1007   0.1726   0.4542
qh102d   0.3889   0.4502  -0.0316   0.3357   0.5324
qh102e  -0.0614   0.2867   0.6583   0.0243   0.4800
qh102f   0.4627   0.5782   0.1123   0.1328   0.4214
qh102g   0.4547   0.4298   0.1930  -0.2863   0.4892
qh102h   0.5981   0.2700  -0.0674  -0.5927   0.2136
qh102i   0.5667   0.2253  -0.0583  -0.6259   0.2328
qh103a   0.5927   0.0061  -0.2342   0.0902   0.5856
qh103b   0.2526   0.5186   0.2339   0.2572   0.5463
qh104a   0.7210  -0.2852   0.0671   0.0813   0.3877
qh104b   0.5821  -0.3323   0.2857   0.1170   0.4555
qh104c   0.7292  -0.3220  -0.0200   0.2259   0.3132
qh104d   0.6639  -0.3600   0.1996   0.1155   0.3765
qh104e   0.7011  -0.4184   0.0886  -0.0046   0.3256
qh104f   0.6508  -0.4812   0.1094  -0.0778   0.3269
qh104g   0.3938  -0.1234  -0.1250   0.0470   0.8118
-----

```

Labels:

- qh101a Timely prayer frequency *
- qh102b Late prayers frequency *
- qh102c Extra prayers frequency *
- qh102d Mosque visits *
- qh102e Outside mosque prayers *
- qh102f Koran reading *
- qh102g Council others do well, prevent sin *
- qh102h Pray to allah beginning meetings *
- qh102i Solace with allah *
- qh103a Vast during Ramadan **
- qh103b Vast outside Ramadan **
- qh104a Zakat (compulsory charity) is important **
- qh104b Sadakat (vol. charity) is an important rel. duty **
- qh104c Haji to Mecca **
- qh104d Tolerate others for Allah **
- qh104e Obay parents for religion **
- qh104f Religion is important **
- qh104g Prevent other-sex company **

* = 5p. frequency scale)

** = 5p. point agree scall