Coupled Lotteries - A New Method to Analyze Inequality Aversion*

Melanie Koch† Lukas Menkhoff‡ Ulrich Schmidt§

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Abstract

We develop and implement a new method to analyze inequality aversion: two peers are endowed with two identical binary lotteries and the only choice they make is whether they want to play out the lotteries independently or with perfect positive correlation. The choice has no other effect than (dis)allowing for possible inequality. We implement the method in a survey in rural Thailand. Choosing positive correlation is related to being more risk averse, having social status concerns and -opposing previous literature- being male. We conclude that our method facilitates a simple and incentive-compatible measurement of inequality aversion in experiments and surveys.

Keywords: Inequality aversion; Correlated risk; Social status concerns
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†DIW Berlin, Germany; Email: melanie.koch@diw.de
‡Humboldt University of Berlin and DIW Berlin, Germany; Email: lmenkhoff@diw.de
§University of Kiel and IfW Kiel, Germany; Email: ulrich.schmidt@ifw-kiel.de

1 Introduction

The pure self-interest hypothesis of standard economic theory has been refuted by an overwhelming body of evidence from economics and psychology in the last decades. The respective literature documents that people typically also have other-regarding preferences that include concerns for the resources of others as well as for reciprocity and fairness. Nowadays, other-regarding preferences are an important cornerstone of the (behavioral) economics literature.

One of the most prominent concepts in the literature on other-regarding preferences is inequality aversion. According to the seminal models of Fehr and Schmidt (1999) and Bolton and Ockenfels (2000) the utility of an inequality averse agent is increasing in both, the own payoff and the equality of the distribution. The prominence of inequality aversion lies in the fact that it can explain observed behavior in many experimental settings which deviates from the self-interest hypothesis. Examples include giving in dictator games, the rejection of low offers in ultimatum games, or conditional cooperation and punishment of free riders in public good games. Outside the lab, the degree of inequality aversion might influence individual preferences over tax deductions, charitable giving and many more aspects of redistribution.

Despite its prominence the measurement of inequality aversion is still flawed. While inequality aversion is intuitively appealing and successful in rationalizing observed behavior in the above mentioned games, it is unclear whether it is indeed inequality aversion or other considerations that are measured in these settings. For instance, Engelmann and Strobel (2004) show that efficiency concerns and maximin preferences are sufficient to explain behavior in distribution experiments. Inequality aversion is not needed to rationalize behavior and, moreover, is at odds with several patterns in their data. In a related paper Fershtman et al. (2012) conclude that social norms are more successful than inequality aversion in explaining behavior in dictator and trust games. Thus, decisions in these games that look like being based on inequality aversion may in fact be originated in other preferences. Still, Tricomi et al. (2010) find neural evidence for the existence of inequality aversion in humans using functional magnetic resonance imaging.

Motivated by this literature the present paper develops and implements a new method to measure and analyze inequality aversion, which we term "coupled lotteries". In this method two players are endowed with two identical binary lotteries (offering amount x with probability $p > 0$ and nothing otherwise) and the only choice

they make is whether they want to play out the lotteries independently ("playing alone") or with perfect positive correlation ("playing together"). This choice only affects ex-post inequality, i.e., there is no inequality if lotteries are played together and a $2p(1-p)$ chance of inequality if lotteries are played alone. When only monetary payoff over both peers is maximized, not coupling the lotteries is the social planners optimal choice, because risk could be shared ex post by reallocating payoffs if one party wins and the other loses. Since the choice of coupling the lotteries decreases the chance of inequality for sure but changes nothing else, inequality aversion seems to be the only way to rationalize this choice.

We implement the coupled lotteries game in a representative survey of rural households in Thailand's Northeastern province Ubon Ratchathani with about 850 households. The advantage of using this survey is, first, that we have a more heterogeneous sample than lab experiments with students, second, that we can employ rather high monetary incentives comprising roughly a half days wage and, third, that we can make use of extensive socioeconomic data for each respondent. Thus, we are able to analyze to which extent our respondents display inequality aversion and which personal and socioeconomic characteristics are associated with inequality aversion. Although there might be cultural differences in the degree of inequality aversion between our relatively poor Thai sample and for example a student sample in an industrialized country, we do not have reason to believe that this impacts the external validity of our method itself. Taking our game to the lab is an interesting question for future research, however given the small stakes there and the other advantages of our sample we opted for the field setting. Interviews are conducted in each respondents household and we let them each play the game against a neighbor of them, who is not part of the sample. Analyzing inequality aversion within such a close reference group is rare in the economic literature and gives new insights into social preferences when social distance is small. It might, however, present an upper bound of inequality aversion (see for example Charness and Gneezy (2008)).

We find that slightly more than 60 percent of respondents choose to play alone versus about 40 percent who prefer to play together. Regarding potentially relevant individual characteristics being related to playing together, i.e. to choose the coupled lotteries, we derive six hypotheses from the literature: inequality aversion is related to being male, older, less educated, poorer, higher risk aversion and having social status concerns. Knowing about individual characteristics is necessary for deriving an empirically-validated microfoundation of inequality aversion and could inform policy

makers who think about implementing inequality reducing policies like progressive taxes or social benefits. Eventually, we get evidence that choosing coupled lotteries is significantly related to being more risk averse and having social status concerns, which is in line with theoretical expectations. We find that men choose to couple lotteries more often than women, thus being more inequality averse. Analyzing various ultimatum and dictator games (for example Andreoni and Vesterlund (2001)), Croson and Gneezy (2009) conclude that in general women seem to be more inequality averse. However, as highlighted before these games might not be suited to identify inequality aversion. Especially, since many of these games exhibit a trade-off between maximizing efficiency and inequality aversion. Potential ex-post risk sharing (which might motivate to play alone) is not supported by our data, as risk sharing would be related to, for example, trust in the village. This is not compatible with our results which show that subjects who trust more prefer to play together.

Finally, we find that our measure for inequality aversion is related to actual behavior. Those household heads among our subjects who are inequality averse are more likely to have some kind of formal insurance for their household and are also more likely to diversify crops (if they are farmers), which is a mean to diversify risk of crop loss. Thus, we also contribute to the literature on how social preferences can affect decision making.

Our paper is closely related to the work of Bellemare et al. (2008) who analyze inequality aversion with a representative sample of the Dutch population. Based on observed decisions in the ultimatum game and proposers' elicited expectation of rejection rates, they estimate a structural model of decision making under uncertainty from which they derive the degree of inequality aversion. Compared to our method, they get a metric measure about the degree of inequality aversion and are able to distinguish between advantageous and disadvantageous inequality aversion, while we only get a binary measure, i.e., we can detect whether a person is inequality averse or not. However, our method has the potential advantage that we do not need to control for expectations and risk attitudes but can observe inequality aversion directly from choices. It is much easier to implement this method into large scale surveys and to get a relatively simple, fast and still valid measure for the presence of inequality aversion. Furthermore, the game is easy to understand and decreases the concern of confounding preference measurement with decision errors.

The paper is organized as follows. The subsequent Section 2 introduces the theoretical background and derives hypotheses. Methods and data are presented in

Section 3, while Section 4 gives results. Robustness checks are shown in Section 5. Section 6 illustrates the relation between our coupled lotteries measure and insurance take-up and Section 7 concludes.

2 Theoretical Background

2.1 Hypotheses

In standard decision theory subjects care only about their own payoffs and, therefore, should be indifferent between playing together and playing alone, coupling the lotteries or not. An alternative to this pure self-interest hypothesis is inequality aversion. As Bellemare et al. (2008) we employ the model of Fehr and Schmidt (1999) to model inequality aversion. Suppose there are two subjects, i and j, with corresponding payoffs x_i and x_j. Then, the utility V_i of subject i is given by

$$V_i = x_i - \alpha_i \max\{x_j - x_i, 0\} - \beta_i \max\{x_i - x_j, 0\} \tag{1}$$

where $0 \leq \beta_i < 1$ and $\alpha_i \geq \beta_i$. In contrast to Bellemare et al. (2008) our method does not separate disadvantageous inequality aversion (measured by α_i) from advantageous one (measured by β_i).

For playing together (t), we always have $x_i = x_j$ such that we get $E(V_i(t)) = 50$. In contrast, when playing alone (a) there is a 0.25-chance to be better off than the peer as well as another 0.25-chance to be worse off than her. Consequently, we get

$$E(V_i(a)) = 50 - 0.25\alpha_i 100 - 0.25\beta_i 100 < 50, \tag{2}$$

i.e., playing together should be preferred by inequality averse subjects. Note that this conclusion also holds in the case of risk aversion or any non-linearities in the perception of inequality, i.e. we can replace V_i in equation (1) also by the more general form:

$$V_i = u_i(x_i) - \alpha_i v_i(\max\{x_j - x_i, 0\}) - \beta_i v_i(\max\{x_i - x_j, 0\}) \tag{3}$$

where u_i reflects the risk attitude and the strictly increasing v_i with $v_i(0) = 0$ reflects the perception of inequality. Moreover, β_i could be even negative, i.e. the subject actually likes advantageous inequality, as long as its absolute value is less than α.

Despite the differences between our method and that of Bellemare et al. (2008) we believe that both methods measure the same aspect of preference. Our initial hypothesis is that sociodemographic characteristics have the same impact in our Thai subject pool as in the Dutch subject pool. According to the results of Bellemare et al. (2008), we, therefore, get the following hypotheses:

Hypothesis 1: *Male subjects are more inequality averse and thus they are more likely to play together.*

In contrast to the previous literature, as for example discussed in Croson and Gneezy (2009), Bellemare et al. (2008) find no significant sex difference in disadvantageous inequality (α), but they find that being male is related to a larger β.

Hypothesis 2: *Older subjects are more inequality averse and thus they are more likely to play together.*

Hypothesis 3: *Less educated subjects are more inequality averse and thus they are more likely to play together.*

Hypothesis 4: *Poorer subjects are more inequality averse and thus they are more likely to play together.*

In addition to those sociodemographic variables which are also analyzed by Bellemare et al. (2008), there is evidence that inequality averse subjects are also risk averse (Carlsson et al., 2005). Thus, we get the following hypothesis:

Hypothesis 5: *More risk averse subjects are more inequality averse and thus they are more likely to play together.*

Furthermore, since social status concern can be a driver of inequality aversion (Shaw and Olson, 2012), a measure for social status concerns is included in the survey. Our final hypothesis reads as follows:

Hypothesis 6: *A larger concern about social status implies a higher probability of playing together. The more weight an individual puts on current social standing as*

reference point, the higher the inequality aversion.

2.2 Alternative Explanations

Ex-Post Risk Sharing. For inequality neutral individuals, there is no payoff gain in coupling the lotteries. However, in our setting there might be an individual gain in choosing the idiosyncratic risk due to the possibility of ex-post risk sharing. In a laboratory experiment this possibility can be ruled out in most cases, but given the fact that our participants live next to each other we cannot control whether they might share the money afterwards. We think that it is a strength of our analysis that subjects know each other well implying that social comparison should have a much stronger impact than in an anonymous laboratory setting. Also, after introducing the game subjects had no chance to interact before making their decisions, i.e., they were not able to agree ex-ante on ex-post risk sharing. Nevertheless, the possibility of ex-post risk sharing is a potential confound when analyzing inequality aversion with our data. We later address this potential confounding factor by adding variables to the analysis that help us detecting the possible presence of ex-post risk sharing. Greater trust and social connection between the players should increase the incentive to do ex-post risk sharing and thereby increase the probability of playing alone. That is because greater trust decreases the level of betrayal aversion (Bohnet et al., 2008; Bolton and Ockenfels, 2010). Bohnet et al. (2008) describe betrayal aversion as being "less willing to take a risk when the source of the risk is another person rather than nature". In our setting nature still decides the outcome of the lottery, but the other player decides to do ex-post risk sharing or not. Thus, she is a source of risk which induces betrayal aversion.

Reciprocity and Altruism. Even if behavior in experimental games cannot be rationalized by efficiency or maximin preferences, there might be other social preferences that confound inequality aversion, namely reciprocity and altruism. Reciprocity is the preference to reward kind and punish unkind actions (Falk and Fischbacher, 2006). In our setting there is no possibility to behave reciprocal, since respondents neither can influence the probability of the other player winning nor can see the choice the other player makes (and vice versa). Fehr and Fischbacher (2003) define altruism in the behavioral sense "as being costly acts that confer economic benefits on other individuals". Except for ex-post risk sharing, which we discuss

extensively in this paper, there is also no scope for altruism in our game.

3 Methodology

3.1 Survey Design

The survey including the game on coupled lotteries was conducted in rural Thailand in 2014. It is part of an add-on project that followed the research project "Impact of shocks on the vulnerability to poverty: Consequences for development of emerging South-East Asian Economics".[1] This project conducts a panel survey in rural Thailand and Vietnam starting from 2007 on and is now better known as Thailand Vietnam Socio Economic Panel (TVSEP). At the time our game was played there had been 4 full waves running (2007, 2008, 2010 and 2013).

Each survey wave consists of a household and a village questionnaire, answered by the respective village head. The household questionnaire is tailored to the lives of families living in rural areas, largely engaged in agricultural business, and to the objective of the research project. It includes comprehensive sections on crop farming, livestock rearing, borrowing/lending as well as saving decisions, health, various socio-economic items for every household member and especially questions on exposure to shocks and anticipated risks. In some waves, personal opinions on topics such as inequality, redistribution and trust are asked for. The full sample consists of about 4400 rural households in 440 villages over six provinces in Thailand and Vietnam. It is representative for the rural populations in these two countries and deliberately excludes households living in urban areas. The three-stage sampling procedure is described in Hardeweg et al. (2013).

[Figure 1 and 2 about here]

The add-on aims at analyzing individual risk preferences in rural populations in more detail, especially how these preferences vary in different situations and how they interact with skills like numeracy and financial literacy. The corresponding questionnaire was substantially shorter than a full survey of the project, adding only items of interest not captured before. It was conducted in only one of the provinces in Thailand, Ubon Ratchathani, which borders Cambodia and Laos (see Figure 1

[1] See https://www.vulnerability-asia.uni-hannover.de/overview.html

and 2). The province lies in the Northeastern part of Thailand called Isan, which is the poorest region in Thailand and where most of the people engage in agricultural activities. The full sample consists of about 850 individuals/households.

For most specifications we combine 2014 and 2013 data, as it results in a richer dataset and gives us the variables we are mainly interested in. The 2013 data include measures on trust, social comparison as well as the socio-economic variables we seek to analyze. We do not exploit the panel structure but include variables from which we assume to be stable over the two points in time. Thus, we specify our regressions as a one-period model. If we want to exploit information on social comparison and trust, we can only do so if the respondent answered in 2014 and 2013, because this is personal information which cannot be reported by another household member. Unfortunately, some respondents only answered the 2014 survey. Therefore, we employ a smaller sample for some of the regressions which we refer to as "subsample". The subsample consists of 521 individuals. The remaining variables from 2013 like sex and education are available as long as the 2014 respondent was already part of the household in 2013 which was always the case.[2]

3.2 The Coupled Lottery

One of the main tasks were four short "games" towards the end of the survey. The preceding section asked respondents to answer a battery of items that measured their financial literacy. The following and final part of the survey was a quiz to measure numeracy. Thus, the games were surrounded by two tasks that asked for similar cognitive and computational skills. However, the financial literacy and numeracy sections are not designed to assess any sort of preference but are knowledge-based.

Respondents were explicitly asked for consent to participate in the games as they are not part of the general survey. Since none of the respondents declined to play, no concern for sample selection into the games is given. The game we are analyzing in this study was titled "social game" and was played after the three other games.[3] The whole task was incentivized by randomly choosing one game to be implemented for payoff. On average respondents earned 165 THB (ca. 5 USD)

[2] In most cases the respondent in the two years was the household head or the spouse.

[3] The first was a multiple price list "game" to elicit risk preferences, the second consisted of four multiple price lists to elicit time preferences and the third one was a memory game focusing on risk taking and lying. We have no reason to believe that these games themselves primed behavior in our game in any specific way.

including a participation fee of 30 THB (ca. 1 USD), which was roughly the mean daily income of a three-person household in the sample.

In our game respondents participated in a simple lottery that would give them 100 THB or 0 THB, each with 50% probability determined by a coin flip. We asked a neighbor of each respondent to join the game. Since the survey is conducted in small villages with mostly about 100 inhabitants, persons know each other quite well. The neighbors were not part of the survey sample and therefore, we do not have further data on them.[4] The crucial move both players then had to make was deciding whether their lotteries were played out by one coin flip for each of them or by one coin flip together. Thus, they had to decide whether they wanted their risk to be perfectly positively correlated to or to be independent of their peer's risk. The expected total payoff is equal in both cases, but the correlation structure changes the relative payoff. Both participants, although sitting next to each other, had to indicate their choice secretly on a piece of paper that was collected by the interviewer who then flipped the coin(s) and announced the outcome.[5] If both players decided to play together, so that only one coin was flipped, both either received 100 THB or nothing. If both decided to play on their own, one coin was flipped for each of them and both received their respective payoff, independently from each other. If they had conflicting preferences meaning one decided to play together and the other to play alone, an additional coin was flipped to determine how the lottery was played out (see Figure 3).

[Figure 3 about here]

To avoid experimenter demand effects, we did not influence participants to do or not to do ex-post risk sharing.

3.3 Empirical Approach

Playing alone or together is a binary decision and since every participant made a valid choice we use a simple logit model to estimate our regressions. Let Y_i denote the decision a participant takes, where $y_i = 0$ means playing together (coupling the lotteries) and $y_i = 1$ means playing alone (not coupling the lotteries). The first

[4] Except for four observations, we could always find a neighbor that agreed to participate.

[5] As mentioned before the respondent was paid for only one of the games, but the neighbor was paid directly after the social game was played.

regression specification only contains information available for the full sample and then reads as follows:

$$Y_i = \alpha + X'_{it}\beta_1 + u_{it} \tag{4}$$

Errors are clustered on the district level and the regressor matrix X'_{it} contains sex, age, education, per capita log income and a measure for risk preference. As the survey was designed to analyze risk preferences, various measures of risk taking are available. These are correlated with each other but aim at risk taking behavior in different situations. We include risk preference measured through the multiple price list method (inspired by Holt and Laury (2002)), which was the only incentivized elicitation method. Education is measured by years of schooling. In one of the regressions we include a first measure to test for ex-post risk sharing. To do so a proxy for trust or closeness to people in the village is used. We employ a variable that indicates whether respondents receive agricultural advice from their neighbors or relatives.

The second regression specification applies to the subsample of respondents who played the game in 2014 and answered the survey in 2013 themselves:

$$Y_i = \alpha + X'_{it}\beta_1 + S'_{it}\beta_2 + u_{it} \tag{5}$$

Besides the same regressor matrix X'_{it} as in (4), matrix S'_{it} is added. S'_{it} contains our measures for social status concerns and a more accurate measure of trust. Respondents are asked whether they compare their standard of living to other persons and to whom. They can choose between 11 different reference groups, where one option is "Neighbors" and another one is "I don't compare myself to anyone". We construct two dummies that equal 1 respectively when respondents choose the respective option and 0 otherwise. Thus, we have a dichotomous measure whether respondents "keep up with Joneses" (choose their neighbors as main reference group for social comparison) and whether respondents care about social status at all. As indicated, respondents can only choose one reference group. Hence, a 0 in the "neighbor dummy" does not mean that respondents do not regard their neighbors for social comparison, but that neighbors are not their primary group for social comparison. In that sense our other measure for social status concerns is cleaner, why we primary

focus on whether respondents compare their standard of living at all in later analysis. A 4-point Likert scale measures how much respondents trust other persons living in their village such that we have a more reliable measure for the possibility of ex-post risk sharing.

3.4 Descriptive Statistics

Table 1 shows summary statistics containing variables used in the two regression models. We include respondents between the age of 16 and 85 for the analysis. The descriptives are split by whether the respondent is the same in both waves, 2013 and 2014, or not. There are two significant differences between the two subsamples which are age and education. As age and education are highly correlated in our sample, it is not surprising that there is significant difference in education given that there is one in age. The difference in age can be explained by the fact that the add-on project in 2014 put less priority on interviewing the household head as the main project did and that other household members are on average younger than their head. Nevertheless, the fraction who chooses to play alone is not significantly different for respondents who only answered the 2014 questionnaire and for those who participated in 2013 and 2014 (see Appendix Figure A.1). Overall, these statistics indicate that we can concentrate on the latter subsample and still receive valid results for the whole sample keeping in mind that individuals are somewhat younger and better educated.

[Table 1 about here]

From the table it can be seen that the majority prefers to not couple the risk. Given the structure of our sample (more women and small degree of risk aversion), this is not surprising based on our hypotheses. Around 60% of the respondents are female and the fraction of women who choose to play alone is significantly higher (two-sided t-test, $p < 0.05$) than the fraction of men who decided to do so (see Appendix Figure A.2). Furthermore, the rural Thai population seems on average to be more risk seeking than Western populations studied before. Dohmen et al. (2011) for example use the same multiple price list method in a representative German sample. Not only is the mean for risk taking higher in the Thai sample, but the whole distribution is skewed to the right with a much higher proportion never switching from the lottery to the safe option (see Appendix Figure A.3). This result is in line with

the conclusion of l'Haridon and Vieider (2018) that persons in poorer countries are substantially more risk tolerant than persons in rich countries on average. Years of schooling and annual income per capita in the Thai rural population are substantially lower than in samples from industrialized countries. For example, the mean respondent in Bellemare et al. (2008) has vocational training or general secondary education and a net household monthly income between 1,000 - 2,500€. Turning to the social comparison variables, almost half of the sample states that the main group of persons they are comparing with are their neighbors. Besides this group, there are around 16% of respondents who do not compare themselves to anyone. Thus, social comparison motives between players have an important role in our setting.

4 Results

For each regression we report average marginal effects (AME). For each observation all variables except the one for which the effect is estimated are held at their realized level. The AME is obtained by taking the mean over all individual marginal effects. Given the many dummy variables, estimating marginal effects at the means (MEM) would be less meaningful as a dummy value between 0 and 1 cannot be interpreted economically (such as being 80 percent female). Table 2 shows regression results using model specification 1, i.e. analyzing the full sample based on eq. 4 from above. First the variables for testing hypothesis 1-5 are used and then, in the third regression we add our proxy variable for trust between neighbors as a proxy to test for the relevance of ex-post risk sharing.

[Table 2 about here]

The highly significant negative effect on being male is in line with hypothesis 1; on average men are 10 percentage points more likely than women to couple the lotteries. This effect is in line with Bellemare et al. (2008) but stronger than their coefficient for the Dutch population. Consequently, we cannot confirm previous studies that find women to be more inequality averse than men. One explanation could be cultural differences; Croson and Gneezy (2009) mention in their paper, that cultural biases could cause sex differences in preferences. Still, from this perspective it may be surprising that the results in Bellemare et al. (2008) point to the same direction as ours. Another explanation could be that in our game there is no trade-off between

inequality and efficiency as in some previous studies. If men prefer efficiency over inequality, this does not automatically mean that they are less inequality averse than women. In general, there might be several confounds in previous studies why women appear to be more inequality averse than men.

We do not confirm hypotheses 2-4. Education and income are never significant. Age is only significant in regression (1) and the effect goes in the opposite direction as hypothesized. These insignificancies are not related to a possible multicollinearity problem. Preference for risk taking is significant in the expected direction. The effect size is not as small as it seems at the first glimpse given that the risk taking variable takes values between 1 and 21. Going from 1 to 21 decreases the probability of coupling the lotteries by over 17 percentage points. Thus, we confirm hypothesis 5, that risk aversion and inequality aversion are positively related to each other. Another possibility would be that risk taking is not related to less inequality aversion in general, but to favoring advantageous inequality. In our setting, only choosing to play alone can lead to advantageous inequality and more risk prone individuals might want to get ahead of the Joneses and are less afraid of falling behind. However, this argument is not supported by our results for social status concerns (see the following paragraphs). Furthermore, there is no additional interaction effect between risk and social comparing.

Regarding ex-post risk sharing, we clearly find evidence against this alternative explanation. Respondents who are closer to their neighbors are more likely to couple lotteries instead of playing alone and potentially sharing afterwards. This effect is significant and large.

We now turn to the subsample of 521 individuals for which we have the information about the importance of social status concerns as well as the improved measure of trust. In Table 3 we report results using model specification (2), i.e. eq. 5. Regression (1) contains the same variables as regression (2) of Table 2 to check how consistent the model is estimated with the smaller sample. In regressions (2) to (4) social status and trust variables are added. The effect sizes for sex are smaller in all presented regressions but are still large and significant. Age and income are as insignificant as before, which is intuitive, because possible effects should have been significant in the larger sample already. For education, however, we find significant effects. Due to the significant differences in age and education between the two samples and the small sample size here, we do not want to interpret this as evidence

for a sizeable effect of education as stated by hypothesis 3. If there is any effect, more educated individuals seem to be more inequality averse, not the other way around. Unfortunately, the smaller sample size further renders the coefficients on risk taking insignificant. They do not differ in direction and size from the full sample specification nevertheless.

[Table 3 about here]

Looking at the measures for social status concerns, we confirm hypothesis 6. Having the neighbors as main reference group for social comparison increases the probability for coupling the lotteries, having no social status concern increases the probability for playing alone. Especially the coefficient for having no social status concerns is large and significant at the 5% level. Moreover, our finding indicates that inequality aversion seems to be stronger if the other person is part of the individual's main reference group for social comparison. We cannot use both variables in the same regression because a substantial part of the sample compares themselves to neighbors which makes the two dummies per definition highly correlated. Therefore, they are included separately in regressions (2) and (3).

Eventually, we again test for ex-post risk sharing, this time using the proxy from the 2014 survey and adding a more reliable measure on trust from 2013. Both coefficients depict a sizable effect and are clearly not in favor of ex-post risk sharing. Respondents trusting other persons in the village a lot are 16 percentage points more likely to couple the lotteries than respondents who do not trust other villagers at all. This is in line with inequality aversion increasing in reducing social distance and that the "comparing with neighbors" dummy turns insignificant if the two variables for trust are added.

5 Robustness Checks

In order to challenge our previous findings, we perform four kinds of robustness tests. (i) In a first step we run regressions focusing on the socio-demographic variables sex and age. (ii) Then, we use different measures for risk preference and income. (iii) Subsequently, we change the level for clustering the error terms from district level to sub-district and village level to see how a less conservative clustering affects the results. (iv) Finally, we control for additional skills that could promote ex-post risk sharing, namely numeracy and financial literacy.

Socio-demographics. We run regressions separated by sex to check for interaction effects between sex and other independent variables (see Table 4). In the same table we narrow the age group we are looking at. Beside the estimates in Section 4 for respondents between 16 and 85 years, we run a regression for respondents aged 18 to 65 separated by using the two measures for social comparison. Looking at the regressions separated by sex we cannot find new significant results. Risk taking loses its significance in the small subsamples as before. However, the different size of the coefficients indicates that the relation between risk aversion and inequality aversion is mainly driven by the male respondents. Comparing oneself with neighbors is significant for the female sample, however, having no social status concerns is not. For the male sample it is the other way around, suggesting different channels between social status concerns and inequality aversion for women and men in our sample.[6]

[Table 4 about here]

The narrowed age group increases the effect of risk taking on the decision, it turns significant although sample size is small. All other results are unchanged except for receiving advice from neighbors which turns insignificant.

Different measures. In this section, we only report regressions using the full sample as all findings can be transferred to the sub-sample. Replacing annual income per capita with annual household income (see Table 5 (1)) similar to Bellemare et al. (2008) does not change any of the other coefficients. Like income per capita it is not significant. The same holds true if income is replaced by the total value of durable assets the household of the respondents owns. Thus, we gain no further insights by using different measures for income or wealth.

[Table 5 about here]

The alternative risk measures we employ are a question for general risk taking on a scale from 0-10 (Dohmen et al., 2011) and a question where respondents had to decide how much to invest in business from a hypothetical lottery prize of 100,000 THB where the chance is 50% that the investment is doubled and 50% that it is halved. With these two measures we do not find a significant effect for risk preference.

[6] Furthermore, there is another difference between female and male respondents. Whereas trust is positively significant for coupling the lotteries for females, receiving advice from neighbors is not significant anymore and again for males it is the other way around.

However, the multiple price list measure seems the more reliable measure given its more detailed scale[7] and that risk taking resembles our setting the most.

Clustering. So far, we have clustered at the district level following Cameron and Miller (2015) to cluster at least at the primary sampling unit. They emphasize that often clustering on an even more aggregated level is more suitable, however, in our sample there is no level above district which we can use for clustering. The only option would be no clustering at all. In that sense our method is the most conservative way to cluster our sample. Nevertheless, we also run regressions clustered at subdistrict and village levels (see Table 6). Effects remain unchanged except for sex and receiving advice from neighbors which lose their significance in the subsample. This is due to the fact that clustering at too low level cannot account for correlated error terms within each district and observations per cluster are too few.

[Table 6 about here]

Skills. As final check we add indices potentially indicating the comprehension of ex-post risk sharing to the regression; these indices represent the skills of numeracy and financial literacy (see Table 7). Numeracy is measured by letting respondents answer 6 standard math equations, which gives us an index taking values between 0 and 6. A higher index value of numeracy is related to an increased probability of coupling the lotteries and thus seems to have a similar effect as education (although education is only significant in the small sample). This result is not driven by a potential multicollinearity problem between education and numeracy.

[Table 7 about here]

For financial literacy two standard questions from the literature (Lusardi and Mitchell, 2014) and two additionally designed questions are used. We find a positive effect on playing alone which would be in favor of ex-post risk sharing. However, the coefficient is only significant in the small sample. In order to better understand potential drivers, we analyze the four items defining the financial literacy index separately. We see that the effect is purely driven by answering the question on inflation correctly, the other questions are not significant. Thus, this might be an artefact of the small sample.

[7] In principle, the investment question allows for a more precise measurement, because respondents can choose any integer value between 0 and 100,000. Nevertheless, respondents only made 22 unique choices where over 50% of the sample chooses 50,000.

6 Insurance Take-Up

In order to test the "predictive power" of our measure for inequality aversion, we estimate the correlation between the measure and actual behavior which, given theoretical considerations, should be related to inequality aversion. More precisely, we run logit regressions to analyze whether our measure is related to formal as well as a kind of informal insurance take-up. Friedl et al. (2014) show theoretically that subjects who are inequality averse should be more prone to insure themselves against risks, especially idiosyncratic ones. Using the TVSEP 2013 survey data, we construct a reliable dummy indicating whether the whole household has any kind of voluntary, formal insurance or not. Furthermore, we run a regression using the Simpson Index of (crop) Diversification as used in Nguyen et al. (2017), measuring if the household is engaged in own agricultural activities. Crop diversification can be used as a kind of informal insurance (see Skoufias (2003)), because it diversifies the risk of crop loss, especially if the additionally planted crops are less sensitive to weather shocks or pest infestation. Farmers in Northeastern Thailand traditionally grow glutinous rice, which is also their main staple. Cassava is a crop that yields similar profit and fulfills the conditions to diversify crop loss. Therefore, we estimate separate regressions for growing glutinous rice and cassava to see whether the motives to grow these two differ from each other. Since the decision what risks to insure and which plants to grow are decisions that are usually made at the household and not the individual level in our setting, we only include subjects who are supposed to be the main decision maker in their household: the household heads.

[Table 8 about here]

Table 8 reports the regression results for different kinds of insurance take-up. Our exogenous variable of interest is the decision subjects make in our coupled lotteries game. Additionally, we include controls which are hypothesized to be decisive for each specific take-up in the respective literature (for example Nguyen et al. (2017)). As can be seen, respondents who are inequality averse, i.e. those who couple the lotteries, are significantly more likely to have formal insurance in their households and to have an above-average crop diversification index. The above-average diversification seems to be driven by growing cassava which, in contrast to glutinous rice, is significantly correlated with being inequality averse. Thus, we can show that our

measure captures real-life inequality aversion and that this aversion is related to insurance demand.

7 Conclusion

Inequality aversion is a well-established concept in the behavioral economics literature which also gains policy relevance due to increasing income inequality in most industrialized countries (Alvaredo et al., 2017). Thus, for sound and evidence-based policy making, it is important to get a better and empirically substantiated understanding of individual inequality aversion. This is currently hampered by the lack of a simple measure of inequality aversion which could be potentially integrated in large household surveys. We here propose such a new, simple measure. Due to its simplicity it is less informative than previous attempts to measure inequality aversion by, e.g., Bellemare et al. (2008) but has the advantages that (i) it requires no further assumptions on expectations and preferences and (ii) can be implemented at relatively little cost in empirical studies.

We term this new measure "coupled lotteries". It is built on a single decision of individuals; whether they want to play a predefined lottery alone (independently) or together with their peers, in our case with their neighbors. Here, playing together means that the lotteries of two individuals are perfectly positively correlated, i.e. both receive the same outcomes, because the lotteries are coupled. As expected payoffs are the same, the decision for coupled lotteries reveals inequality aversion.

We find in our sample of 850 poor households from rural Thailand that about 60% of respondents prefer to play alone, whereas 40% prefer the coupled lotteries. The latter choice is related to being more risk averse and having social status concerns. In contrast to previous studies, but in line with Bellemare et al. (2008), our results suggest that men are more inequality averse than women and that previous studies might include confounding factors. As a competing explanation of this finding one may argue that those individuals prefer to play alone who are aware of the possibility of ex-post risk sharing. However, we examine several variables underlying such awareness and expectation, but none of them supports this explanation.

In addition to these results, we find that our measure is related to real-life choices: household heads who are inequality averse are more likely to have formal insurance for their household and more likely to diversify the crops they are cultivating, which

can be interpreted as a kind of insurance.

Thus, we conclude that our method gives us a robust measure of inequality aversion within our sample. Future research is needed to show whether this finding has high external validity and holds, for example, in surveys with different populations.

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Figures and Tables

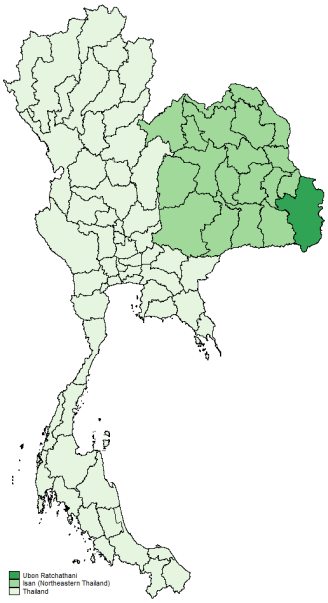

Figure 1: Study Site 2014, Ubon Ratchathani Thailand

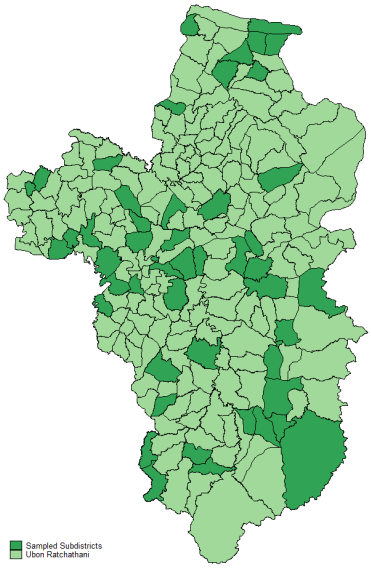

Figure 2: Sampled Subdistricts

Player 2 \ Player 1	Alone	Together
Alone	A	C
Together	C	B

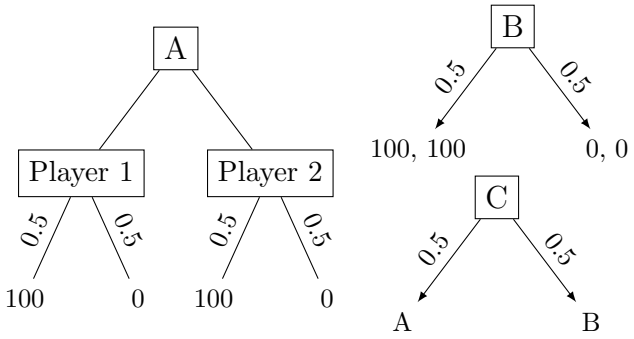

Figure 3: Coupled Lotteries: Decision Matrix and Connected Outcomes

Table 1: Descriptive Statistics of the Sample

	(1) Full Sample	(2) 2013 and 2014 Survey	(3) Only 2014 Survey	(4) Difference
Decision Taken	0.63	0.64	0.61	−0.03
Male	0.37	0.35	0.40	0.05
Age	52.97	55.24	49.40	−5.84***
Years of Schooling	5.94	5.48	6.66	1.18***
Income per Cap. (USD)	716.57	724.36	703.43	−20.92
Risk Taking, MPL	11.03	10.98	11.11	0.13
Advice from Neighbor	0.14	0.14	0.13	−0.02
Trust in Village		3.12		
Comparing with Neighbors		0.48		
Not Comparing		0.16		
Observations	851	521	330	851

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Logistic Regressions, Full Sample

	(1)	(2)	(3)
Male	−0.101***	−0.099***	−0.099***
	(0.032)	(0.033)	(0.034)
Age	0.002**	0.001	0.001
	(0.001)	(0.001)	(0.001)
Years of Schooling	−0.003	−0.004	−0.005
	(0.005)	(0.005)	(0.005)
Risk Taking, MPL	0.004*	0.004*	0.004*
	(0.002)	(0.002)	(0.002)
Income per Capita (log)		0.015	0.013
		(0.026)	(0.025)
Advice from Neighbor			−0.075*
			(0.039)
Observations	849	829	829
Baseline Predicted Probability	0.631	0.633	0.633
McFaddens R-squared	0.046	0.046	0.048

Dependent Variable: Decision to play together (=0) or alone (=1);
District Dummies not reported; Average Marginal Effects reported;
SE clustered at district level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Logistic Regressions, Subsample

	(1)	(2)	(3)	(4)
Male	−0.067*	−0.068*	−0.071**	−0.068**
	(0.037)	(0.038)	(0.037)	(0.035)
Age	0.000	0.000	0.000	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Years of Schooling	−0.015**	−0.015**	−0.013*	−0.013*
	(0.007)	(0.007)	(0.007)	(0.007)
Income per Capita (log)	0.031	0.033	0.035	0.032
	(0.034)	(0.034)	(0.034)	(0.033)
Risk Taking, MPL	0.003	0.004	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.003)
Advice from Neighbor				−0.086*
				(0.048)
Not Comparing			0.127**	0.129***
			(0.048)	(0.045)
Comparing with Neighbors		−0.060*		
		(0.036)		
Trust in Village				−0.059**
				(0.025)
Observations	521	521	521	521
Baseline Predicted Probability	0.641	0.641	0.641	0.641
McFaddens R-squared	0.044	0.047	0.052	0.061

Dependent Variable: Decision to play together (=0) or alone (=1);
District Dummies not reported; Average Marginal Effects reported;
SE clustered at district level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Logistic Regressions, Split by Sex and Narrower Age Group

	Female	Male	Age 18-65	Age 18-65
Male			−0.087**	−0.091**
			(0.038)	(0.039)
Age	0.000	0.000		
	(0.003)	(0.003)		
Years of Schooling	−0.015	−0.018	−0.016**	−0.016*
	(0.010)	(0.014)	(0.008)	(0.008)
Income per Capita (log)	0.027	0.056	0.026	0.028
	(0.034)	(0.056)	(0.033)	(0.034)
Risk Taking, MPL	0.001	0.007	0.006**	0.006***
	(0.004)	(0.005)	(0.002)	(0.002)
Advice from Neighbor			0.018	0.016
			(0.032)	(0.034)
Not Comparing		0.261**		0.104**
		(0.078)		(0.046)
Comparing with Neighbors	−0.080*		−0.014	
	(0.048)		(0.040)	
Trust in Village			−0.067**	−0.066**
			(0.031)	(0.029)
Observations	341	178	414	414
Baseline Predicted Probability	0.657	0.618	0.647	0.647
McFaddens R-squared	0.064	0.095	0.067	0.072

Dependent Variable: Decision to play together (=0) or alone (=1);
District Dummies not reported; Average Marginal Effects reported;
SE clustered at district level
* $p < 0.11$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Logistic Regressions, Different Measures for Risk and Income

	HH Inc.	Dur. Assets	Risk	Invest
Male	−0.097***	−0.099***	−0.099***	−0.098***
	(0.032)	(0.033)	(0.033)	(0.033)
Age	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Years of Schooling	−0.004	−0.003	−0.005	−0.004
	(0.005)	(0.005)	(0.006)	(0.005)
Income per Capita (log)			0.016	0.016
			(0.026)	(0.026)
Risk Taking, MPL	0.004*	0.004**		
	(0.002)	(0.002)		
HH Income(log)	−0.006			
	(0.027)			
Assets Value		−0.000		
		(0.000)		
General Risk Taking			0.003	
			(0.008)	
Hypothetical Investment				0.000
				(0.000)
Observations	829	829	828	828
Baseline Predicted Probability	0.633	0.633	0.633	0.633
McFaddens R-squared	0.045	0.046	0.044	0.043

Dependent Variable: Decision to play together (=0) or alone (=1);
District Dummies not reported; Average Marginal Effects reported;
SE clustered at district level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Logistic Regressions, Different Levels for Clustering

	Subdistr.	Subdistr.	Village	Village
Male	-0.098^{***}	-0.067	-0.098^{***}	-0.067
	(0.034)	(0.045)	(0.035)	(0.045)
Age	0.001	0.001	0.001	0.001
	(0.001)	(0.002)	(0.001)	(0.002)
Years of Schooling	-0.005	-0.013^{*}	-0.005	-0.013
	(0.005)	(0.007)	(0.005)	(0.008)
Income per Capita (log)	0.013	0.032	0.013	0.032
	(0.022)	(0.030)	(0.025)	(0.030)
Risk Taking, MPL	0.004^{*}	0.004	0.004	0.004
	(0.002)	(0.002)	(0.002)	(0.003)
Advice from Neighbor	-0.075^{*}	-0.086	-0.075^{*}	-0.086
	(0.046)	(0.055)	(0.044)	(0.057)
Not Comparing		0.129^{**}		0.129^{**}
		(0.048)		(0.053)
Trust in Village		-0.059^{**}		-0.059^{**}
		(0.025)		(0.029)
Observations	829	521	829	521
Baseline Predicted Probability	0.633	0.641	0.633	0.641
McFaddens R-squared	0.048	0.061	0.048	0.061

Dependent Variable: Decision to play together (=0) or alone (=1);
District Dummies not reported; Average Marginal Effects reported;
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Logistic Regressions, Numeracy and Financial Literacy

	(1)	(2)	(3)
Male	−0.095***	−0.065*	−0.066**
	(0.033)	(0.034)	(0.030)
Age	0.001	0.001	0.001
	(0.001)	(0.002)	(0.002)
Years of Schooling	−0.003	−0.012*	−0.013*
	(0.005)	(0.007)	(0.007)
Income per Capita (log)	0.014	0.032	0.029
	(0.025)	(0.032)	(0.031)
Risk Taking, MPL	0.004*	0.004	0.004
	(0.002)	(0.003)	(0.003)
Advice from Neighbor	−0.081**	−0.084*	−0.097**
	(0.041)	(0.048)	(0.047)
Not Comparing		0.127***	0.127***
		(0.046)	(0.046)
Trust in Village		−0.057**	−0.062**
		(0.025)	(0.027)
Numeracy	−0.030***	−0.013	−0.016
	(0.010)	(0.015)	(0.016)
Financial Literacy	0.011	0.029*	
	(0.013)	(0.017)	
Inflation			0.124**
			(0.052)
Interest Rates			−0.007
			(0.038)
Expected Utility			−0.018
			(0.040)
Loan Conditions			0.023
			(0.037)
Observations	829	521	521
Baseline Predicted Probability	0.633	0.641	0.641
McFaddens R-squared	0.052	0.064	0.074

Dependent Variable: Decision to play together (=0) or alone (=1);
District Dummies not reported; Average Marginal Effects reported;
SE clustered at district level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Logistic Regressions, Insurance Demand and Crop Diversity

	Having Insurance	Above Mean Crop Index	Glutinous Rice	Cassava
Inequality Aversion	0.066**	0.101*	−0.073	0.078**
	(0.026)	(0.060)	(0.049)	(0.041)
Male	−0.040	−0.002	0.013	0.002
	(0.032)	(0.084)	(0.048)	(0.041)
Age	0.003	0.002	−0.001	−0.002
	(0.003)	(0.002)	(0.002)	(0.001)
Years of Schooling	0.013	−0.002	−0.008	−0.001
	(0.011)	(0.010)	(0.006)	(0.007)
HH Income(log)	0.078***	−0.027	0.060**	−0.052
	(0.030)	(0.059)	(0.025)	(0.042)
Household nucleus size	0.024**	−0.002	0.003	−0.002
	(0.012)	(0.011)	(0.015)	(0.008)
Risk Taking, MPL	−0.000	−0.000	0.001	−0.005*
	(0.003)	(0.003)	(0.003)	(0.003)
Numeracy	−0.002	0.017	0.006	−0.015
	(0.018)	(0.015)	(0.014)	(0.015)
Financial Literacy	0.008	−0.004	−0.012	0.000
	(0.022)	(0.028)	(0.023)	(0.016)
Self Employed	0.067			
	(0.075)			
HH better off in 5 years	−0.037*			
	(0.020)			
Number Anticipated Risks	−0.007			
	(0.009)			
Number Weather Risks		0.018	0.023	0.017
		(0.036)	(0.020)	(0.017)
Land Size		0.005	0.006**	0.006***
		(0.004)	(0.002)	(0.001)
Number of Tractors		0.090*	0.083***	−0.010
		(0.048)	(0.030)	(0.041)
Number of Waterpumps		−0.022	−0.019	−0.061**
		(0.048)	(0.023)	(0.024)
Observations	424	319	319	319
Baseline Predicted Probability	0.773	0.537	0.792	0.193
McFaddens R-squared	0.130	0.079	0.225	0.365

Dependent Variables: Having Insurance, Simpson Index of Crop-Land Share Diversification above Mean and growing Glutinous Rice and Cassava; District Dummies not reported; Average Marginal Effects reported; SE clustered at district level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A Appendices

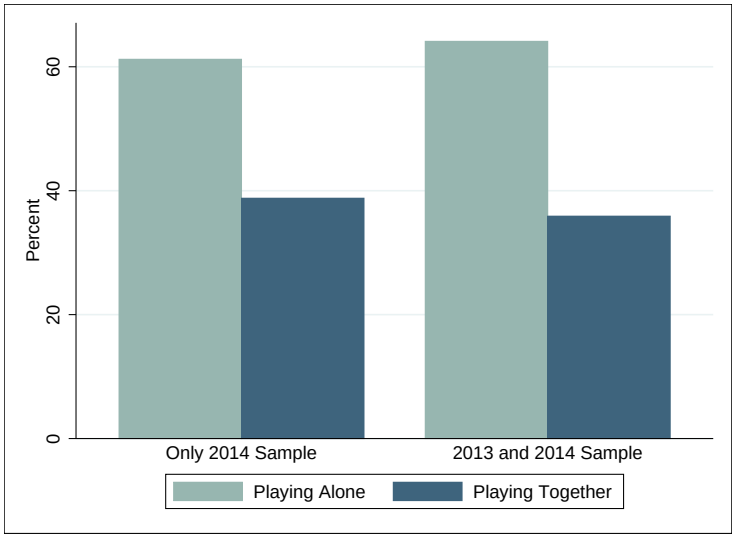

Figure A.1: Share of Respondents Choose to Play Together vs Alone by Survey Participation

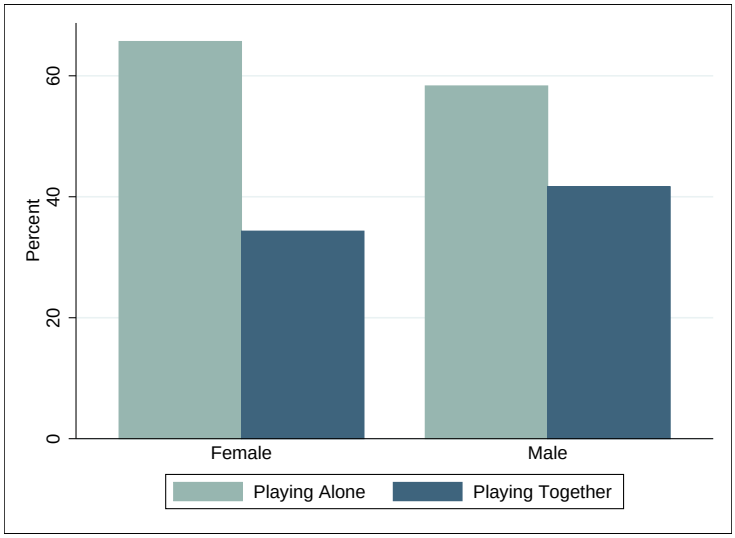

Figure A.2: Share of Respondents Choose to Play Together vs Alone by Sex

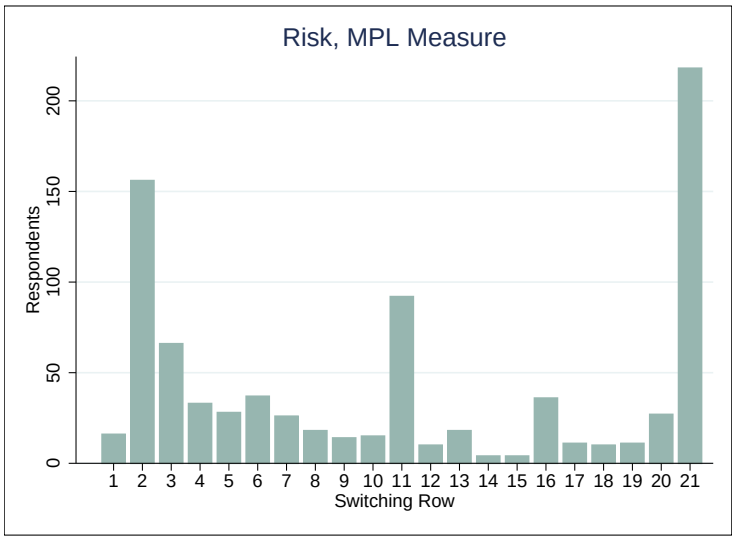

Figure A.3: Switching Row, from Lottery to Safe Amount in Multiple Price List Game

B Instructions

SECTION 7 – Risk Games

HOW ARE YOU FEELING NOW?
*Very good*_____*01*
*Good*_____*02*
*Quite ok*_____*03*
*Not so good*_____*04*
*Bad*_____*05*

General Instructions *(Enumerator: read out)*

Now we would like to invite you to play 4 games. The first game is about choosing a lottery or a safe amount; the second game is about choosing a sooner or a later amount, the third game is about rolling a dice and to memorize the number of eyes; the fourth one is about sharing the benefits together with a neighbor. After you are finished with playing the 4 games, you will play one game for real money. Therefore you are asked to blindly draw one out of four numbers from 1 to 4) to determine which of these 4 games is paid out in real money.

For each of these 4 games we will show you cards that contain all information for you to make decision. (*Enumerator: show participants the 4 show cards*)
We will note your choice for each question in our record sheets.

1 Do you agree to play these games with us?

*Yes*_____*01 (go to section 7.1)*
*No*_____*02 (fill in next question and proceed with section 8)*

2 In case you decide not to participate in the risk games please tell us why you do not want to participate?

*Religion*_____*01*
*Bad experience with risk games*_____*02*
*Never play games*_____*03*
*Others, please specify*_____*04*

Figure A.4: Introductory Statement for the Games Section of the Survey

There is a 50:50 chance to win 100 THB. Do you want to win or lose alone or together? (Enumerator, please tell the respondent that this game is played together with respondent's neighbor. The 50:50 chance to win 100 THB will be determined by a flip of a coin. Ask both the respondent and his neighbor if they like to take the chance to win or lose together or if they like to take the chance to win or lose alone. Pass them the attached extra sheets and let them secretly circle their answer.)

1 Hidden choice (Enumerator, please tick the box according to the hidden choice of the respondent and of the neighbor)

	Like to play alone	Like to play together
Respondent	☐	☐
Neighbor	☐	☐

Figure A.5: Instructions for the Coupled Lotteries Game

Hidden choice: Respondent

Please tick how do you like to play the following game:

The coin decides if you win 100THB ("King") or 0 THB ("Palace")

Do you like to play **alone**? ☐

Or

Do you like to play **together** with your neighbour? ☐

Hidden choice: Neighbour

Please tick how do you like to play the following game:

The coin decides if you win 100THB ("King") or 0 THB ("Palace")

Do you like to play **alone**? ☐

Or

Do you like to play **together** with your neighbour? ☐

Figure A.6: Decision Sheets for Respondent and Neighbor

C Description of Independent Variables

Male	Sex of respondent, 0=Female, 1=Male
Age	Age of respondent in years
Years of Schooling	Years respondent went to school
Income per Capita	Log annual income per capita in 2013 USD
HH Income (log)	Log annual household income in 2013 USD
Assets Value	Total value of all durable goods in the household in THB
Risk Taking, MPL	Risk preference measured via Multiple price list method, variable indicates the switching row from the lottery to the safe amount, rows from "1"-"21(Never)". The lottery gives 300 THB with 50% chance and 0 THB with 50% chance, the safe amount increases gradually from 0 to 190 THB.
General Risk Taking	Answer to "Are you generally a person who is willing to take risks or do you try to avoid taking risk?", from 0-"Fully unwilling to take risks" to 10-"Fully willing to take risks".
Hypothetical Investment	Amount of money respondents would invest if they would win 100,000 THB and the chance is 50% that the investment is doubled and 50% that it is halved.
Comparing with Neighbors	Dummy for neighbors being the main reference group respondents compare their standard of living with
Not Comparing	Dummy for not comparing oneself's standard of living to other persons
Advice from Neighbor	Dummy whether respondents take agricultural advice from neighbors/relatives
Trust in Village	Believe in trustworthiness of other persons in the own village from 1-"Trust them not at all"to 4-"Trust them a lot"

Numeracy	Counts the number of right answers to following questions:
1	What is 45 + 72?
2	You have 4 friends and you want to give each friend 4 sweets. How many sweets do you need?
3	What is 5% of 200?
4	You want to buy a bag of rice that costs 270 Baht, but you only have one 1000 Baht note. How much change will you get back?
5	In a sale, a shop is selling all items at half price. Before the sale, a mattress costs 3000 Baht. How much will the mattress cost in the sale?
6	A second-hand motorbike dealer is selling a motorbike for 12000 Baht. His is two thirds of what a new motobike costs new. How much did the new motorbike cost?
Financial Literacy	Counts the number of right answers to following questions:
Interest Rates	If today you borrow 10 000 THB, at an interest rate of 2% per month, after 3 months how much do you owe totally (principle + interest)? Less than 10,200 THB More than 10,200 THB Exactly 10,200 THB
Inflation	If you have 10 000 THB in an account, the interest rate on the account is 10% per year, and during this time, the price of goods and services rises by 12% per year, after one year you can buy: Less than you can buy today More than you can buy today Exactly the same as today
Expected Utility	For the same amount of money, a person can enter either one these two lotteries. Lottery A pays a prize of 2000 THB, and the chance of winning is 5%. Lottery B pays a prize of 100 THB, and the chance of winning is 10%. Which Lottery pays the higher expected amount? Lottery A Lottery B Two lotteries pay the same expected amount
Loan Conditions	Suppose you need to borrow 50 000 THB. Two people offer you two different loans, the first loan you have to pay back 60 000 THB in one month, with the second loan you have to pay back 50 000 THB plus 15% in one month. Which loan is the better option?