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Individual's Risk Attitudes in sub-Saharan Africa: Determinants and Reliability of Self-reported Risk in Burkina Faso

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Individual's Risk Attitudes in sub-Saharan Africa:

Determinants and Reliability of Self-reported Risk in Burkina Faso[1]

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Abstract

Risk taking is an important topic in Africa, as access to financial institutions and social security is scarce. Data on risk attitudes in Africa is limited and the available data collected might not be reliable. We investigate the determinants of risk attitudes and the reliability of survey data in a sub-Saharan country, like Burkina Faso. Using a large representative panel survey of 31 677 individuals, we analyze the determinants and the test-retest reliability for different risk attitudes in general, traffic and financial matters. Our results show that determinants such as individual's sex and age are significantly associated with willingness to take risk. Women have more reliable risk measures compared to men, older individuals have more reliable risk measures than younger individuals and those with high education exhibit a higher reliability in terms of their self-reported risk attitude compared to people with low education. Reliability differs across risk attitudes; risk-taking in traffic has the highest test-retest reliability followed by willingness to take risk in general and financial matters.

Keywords: risk attitudes; determinants of risk-taking; test-retest reliability; Burkina Faso
JEL codes: **D0, D81, J10**

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1. Introduction

Willingness to take risk is an important factor in almost every economic decision-making, as individual risk attitudes are a core determinant of economic behavior. Recent literature has focused on measuring individual risk attitudes and their determinants to predict and understand economic behavior. [4] We investigate the determinants of individual risk attitudes and the reliability of survey data for a sub-Saharan African country, Burkina Faso. We analyze the determinants and the test-retest reliability for risk attitudes in general, traffic and financial matters by using a large representative panel survey of 31 677 individuals.

Understanding and predicting individual risk attitudes is an important topic in sub-Sahara Africa, such as Burkina Faso, where access to formal financial services and social security is scarce or under development (e.g. Arvai and Post, 2012; Ncube, 2007). There is an emerging line of research focusing on providing information on individual's risk attitudes in sub-Sahara Africa.[5] For instance, findings from 211 small-scale cattle farmers in Mali and Burkina Faso, show that farmers with higher education, income and more children in school are more willing to take risk and are more patient (Liebenehm and Waibel, 2014). However, the shortcoming of this emerging line of research is that the available data collected might not be reliable, due to sample size, geographic variation and or panel structure.

We have collected the same type of risk measurement as used in previous research.[6] We capture risk attitudes in general, traffic and financial matters for a panel of 31 677 individuals in Burkina Faso. The large sample size provides the necessary statistical power for analyzing the determinants and the test-retest reliability of risk attitudes by dividing the sample into different subgroups. The sample size has also additional benefits by decreasing the probability of Type I and Type II errors, which is detrimental when making inference.

This paper contributes at multiple levels to the emerging line of research on individual's risk attitudes in sub-Saharan Africa. The first contribution of this study is to replicate the findings of previous literature, such as Dohmen et al., (2011) and Hardweg et al., (2013), but with a large national representative sample in a sub-Saharan African country, which increases the precision of our results. Our main results about the determinants of risk

[4] Such as risk attitudes and occupation (Bonin et al., 2007), self-employment (Cramer et al., 2002 and Caliendo et al., 2009) and investment in human capital (Guiso and Paiella 2005; Budria et al., 2009; Brunello 2002).

[5] Such as in Ethiopia and Uganda (Harrison et al., 2005), Tanzania, Zambia and Zimbabwe (see Cardenas and Carpenter 2008 for a literature review), Northern Ethiopia (Yesuf and Bluffstone, 2009) and rural Uganda (Tanaka and Munro 2013).

[6] Such as in Ding et al., 2010; Dohmen et al., 2011; Wölbert and Riedl, 2013; Hardeweg et al., 2013; Beauchamp et al., 2015; Liebenehm et al., 2015; Lönnqvist et al., 2015; Vieider et al., 2015; Jin et al., 2017.

attitudes are in line with the previous studies (ibid). Gender and age are important determinants for willingness to take risk in general, traffic and financial matters. Individuals own level of education tends to be much more important in financial matters, than in traffic and general risk attitudes. Parent's literacy determines risk taking in general and traffic.

Second, the findings of this study contributes to the recent integration of individuals-difference psychology into economics (Almlund et al., 2011; Borghans et al., 2008), where the argument is that risk attitudes are context-specific (Weber et al., 2002; Vlaev et al., 2010; Highhouse et al., 2016). Our results show that individual risk attitude in general correlates well with traffic and financial matters. However, the magnitude of our results differ across risk taking in different domains. Women (and older individuals) are less willing than men (and younger individuals) to take risk in traffic compared to in general and financial matters.

Third, this study makes a unique contribution to the literature by analyzing the test-retest reliability of three self-reported risk questions in a large national representative panel survey in Burkina Faso. Although previous findings all indicate a high validity for survey measures concerning risk attitudes[7], there are no studies in developing countries focusing on the reliability of self-reported risk attitudes. The importance of understanding how reliable a survey measurement is has to do with the overall consistency of the instrument: does it produce similar results under consistently applied conditions? Or are the obtained scores due to randomly occurring factors like seasonality or current event, and measurement error (Marczyk et al., 2005)? Hence, reliability of risk preferences is an important empirical question, that economist have only recently begun to address. To the best of our knowledge, there are only three studies, with small and homogenous sample size, that examine whether self-reported willingness to take risk are reliable: in Sweden (Beauchamp et al., 2015 (n=494)) and Germany (Dohmen et al., 2016 (n=300); Lönnqvist et al., 2015 (n=44)).[8] Our results show that women (older individuals and high educated) have more reliable risk

[7] The validity of the same self-reported risk measures that we use has been investigated extensively by comparing them to lottery type field experiments, in developed countries (e.g. Dohmen et al., 2011; Lönnqvist et al., 2015), emerging countries (e.g. Hardeweg et al., 2013), developing countries and comparatively for 30 countries (Vieider et al., 2015).

[8] The are other studies that have also attempted to address the reliability of risk question over time (with different risk measurements than ours), but same small and/or homogenous sample size, such as a typical multiple price list (Andersen et al., 2008 (n=97)), gain/loss lotteries (Zeisberger et al., 2012 (n=86)), hypothetical income gambles (Barsky et al., 1997 and Kimball et al., 2008 (n=693)) and different types of self-reported risk question than ours (1-5 scale, with different random ordering of scales) over time (Weber et al., 2002 (n=121)). However, the studies that found reliability results that are more than only moderately stable over time, are those that use the same self-reported willingness to take risk question as in this paper. These findings support the use of this observed risk measure for the underlying objectively measurable risk attitudes.

measures than men (younger individuals and low educated). Reliability differs across domains; risk-taking in traffic has the highest test-retest reliability followed by willingness to take risk in general and financial matters.

Fourth, there are two important implications for measuring risk attitudes in a sub-Saharan African country. First, risk in general could be used as a proxy for other risk context, but it is less precise in predicting risk-taking in other contexts. We recommend having a context specific risk question if the research question depends on it. Second, this study provides an important pathway for researchers who would like to focus on individual's risk attitudes but have scare resources to collect an incentivized risk measurement. Self-reported risk not only have a high validity, as previous research have showed, but as this study shows the reliability is also satisfactory. This is in particular important for sub-Saharan African countries, as it becomes possible to capture individual's economic behavior through surveys, instead of investing great resources in designing and collecting incentivized risk measurements.

All in all, this illustrates the importance of reliability and reproducibility of scientific findings (Dreber et al., 2015; Camerer et al., 2016) by using and analyzing the same measures as previous literature.

The remainder of the paper is structured as follows. We begin by providing a description of the data collected in section 2; in section 3, we start with descriptive statistics of our variables, and look at the stability of risk attitudes across different domains (general, traffic and financial matters). In section 3 we also investigate the determinants of risk attitudes. In section 4, we estimate the test-retest reliability of the three risk measures, for different subsamples and subgroups. We conclude in section 5.

2. Data Description

Our study is based on a multipurpose Household Budget Survey (HBS). The HBS is a face-to-face nationally representative panel survey covering 10,800 households in each one of the 13 regions of Burkina Faso.[9] The main purpose of the HBS is to evaluate whether Burkina Faso has achieved the UN millennium goals, which is why each household is interviewed in four rounds during 2014. The HBS surveys the head of each household in the sample. It also surveys all other members present in the household at the time of the interview and collects

[9] The face-to-face interview is superior compared to other interview techniques, such as questionnaire or/and telephone, as it provides a more accurate screening of respondents (for instance in terms of sex, age, level of literacy, etc.), efficient interviewing time and quality checks of questions.

demographic information for the remaining non-present members at the time of the interview. Besides collecting household information, such as expenditure and consumption data, respondents are also asked to provide a range of personal information through rotating questionnaire modules. The risk attitudes have been collected in the third and fourth rounds of 2014 as a separate module for all household members over the age of 17. The third round was conducted during July–September and the fourth round during October–December.

This study focuses on three different risk questions in the HBS that directly ask the respondent to assess his or her willingness to take risks in traffic, in financial matters and in general. We have adopted the same self-reported risk questions from the German Socioeconomic Panel, which has been used extensively in previous studies and has also been empirically validated through field experiments as being a fruitful way of eliciting a reliable measurement of risk preferences (Dohmen et al., 2011; Hardeweg et al., 2013; Beauchamp et al., 2015; Vieider et al., 2015; Lönnqvist et al., 2015). The exact English wording of the questions is as follows: "*How do you see yourself: Are you a person who is fully prepared to take risk or do you try to avoid taking risks? On a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk. A. In traffic (driving a car, motorcycle, bike, etc.), B. In financial matters, C. In general?*"

The HBS has an overall household response rate of approximately 95 percent for the third and fourth round respectively, which gives us a low level of attrition. All respondents 18 years and above have answered all three risk questions. However, not all respondents have answered at both time points. The number of responses in the third round is 34,494, in the fourth round it is 33,066 and in both rounds the number of responses for the same individuals is 31,677 for all three risk questions. The analysis in this study only uses the respondents who have answered all three risk questions at both time periods.

3. Descriptive Statistics and Contributing Factors concerning Risk Attitudes

Figure 1 shows the distribution of risk attitudes in traffic, financial matters and in general for our sample. The black bars in the histograms show the responses for the third round of the survey, while the grey bars show the responses for the fourth round on an ordinal scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk. Figure 1 shows a reassuring fact: unlike most ordinal scale question responses, the three risk

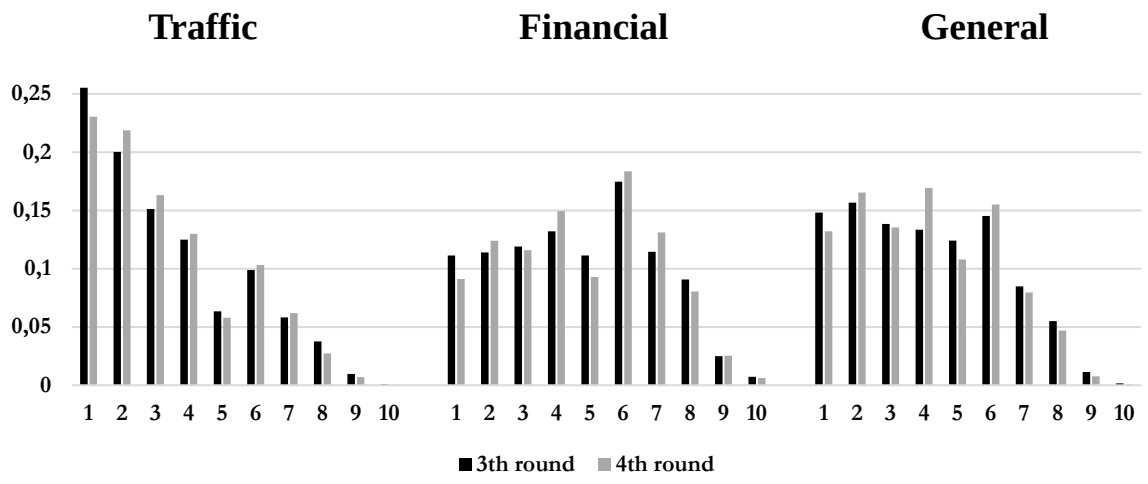
questions are not centered in the middle,[10] which suggests that the respondents have understood the question and are not indifferent to the scaling. Previous research suggest that (poor) households in developing countries are reluctant to invest in new technologies due to their risk aversion (Tanaka et al., 2010), and indicate that individuals from sub-Sahara Africa are on average less willing to take risk (Yesuf and Bluffstone, 2009) compared to developed countries (Holt and Laury, 2002; Dohmen et al., 2011). Expanding the comparisons, the literature indicates the reverse that individuals from sub-Sahara Africa are not more risk averse (e.g. Wik et al., 2004; Harrison et al., 2005) compared to developed countries (e.g. Holt and Laury, 2002; Jimenez 2004). Figure 1 shows considerable heterogeneity in risk attitudes across the population as well as between the three risk domains. We see that the respondents are much more risk-averse in their attitudes toward traffic than financial matters or in general, as indicated by the fact that the bars are much higher to the left side of the diagram. This interpretation is supported by a mean value of 3.32 (3.31) in traffic for the third round (fourth round), while the mean values for financial and general are higher: 4.65 (4.70) and 4.06 (4.02). Moreover, in the figure we see that the responses between the third and the fourth round have a similar distribution.

Figure 2 illustrates the difference between the two time periods (between the third and fourth round) in each individual's response to the study's three risk questions. On the y-axes, we have the response rate, and on the x-axes we have the difference in the respondents' self-assessment to each risk question between the third and fourth round. Thirty-five percent of respondents have not changed their self-assessment to the traffic risk question between the two time periods. The corresponding values for financial and general risk questions are somewhat lower at 25 and 28 percent, indicating that there is either a reliability issue with the self-reported risk questions, such as a classical measurement error, or that individual self-assessments change to a higher extent when it comes to financial or/and general matters compared to traffic. The bars to the left of zero reveal that the respondent has increased his or her self-assessment in the fourth round and the bars to the right reveal the opposite: decreased self-assessment in the fourth round. Adding the respondents who have changed their response with 1 or 0 points in the scale between the two time periods, we get 65 percent for traffic, 54 for financial and 61 percent for general risk questions. The overall majority of the respondents

[10] Similar studies on risk attitudes have around 22 percent of respondent's responses centered in the middle for developed countries (Dohmen et al., 2011) and 40 percent for emerging country (Hardeweg et al., 2013).

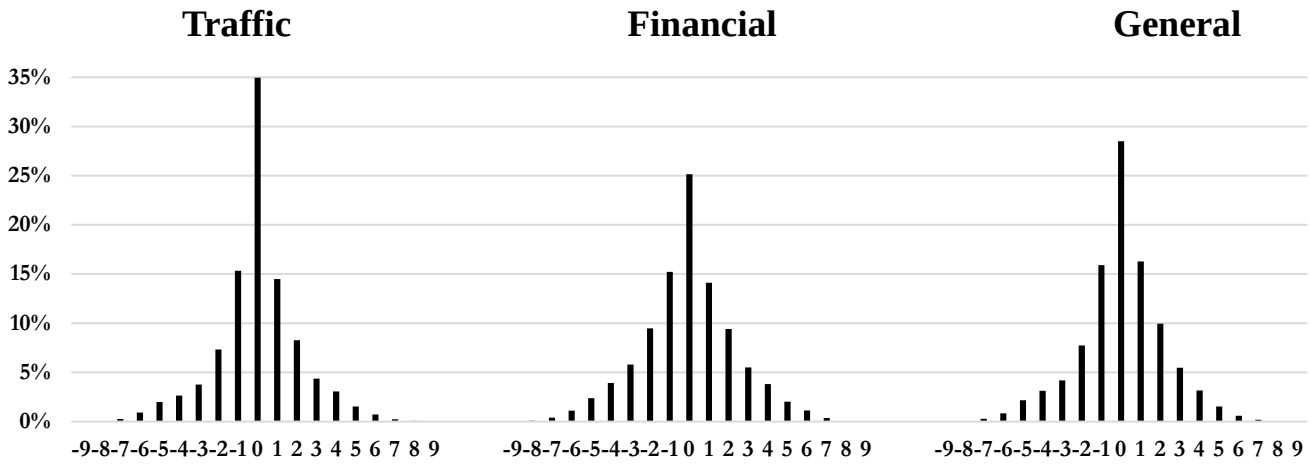
have a difference below |3| points between the two time periods: 89 (traffic), 85 (financial) and 88 (general) percent.

Figure 1: Willingness to Take Risks at Two Time Periods



Note: On the x-axes, we have the response to the risk questions on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in the third and fourth round. On the y-axes, we see the fractions.

Figure 2: Differences between Risk Attitudes in Time



Note: On the x-axes, we have the difference between round 3 and 4 for individual responses to each risk question. The y-axes represent the response rate in percent.

3.1 Descriptive Statistics of Self-Responses concerning Risk

We now turn to a first descriptive look on self-assessments of risk attitudes and different individual characteristics, as illustrated in Table 1. We classify these characteristics into six different groups, influenced by Hardeweg et al., (2013): 1) demographic characteristics and parental background, 2) economic status, 3) family structure, 4) employment status, 5) subjective attitudes and, finally, 6) health status. In the risk literature, most of these characteristics are considered endogenous with respect to risk attitudes, although it has been argued that the demographic characteristics are largely exogenous (e.g. Dohmen et al., 2011; Hardeweg et al., 2013). Nevertheless, the focus of this study is not to causally estimate risk attitudes, it is rather to analyze whether associations of risk attitudes with regard to individual characteristics have the same expected sign as in previous studies.

The demographic characteristics are age and sex of respondents. Willingness to take risk has been shown to decrease with age (Bishai 2004; Tanaka et al., 2010). However, there are few representative surveys large enough to break down risk attitudes by age groups. In the HBS, risk attitudes in all three domains and the two time periods on average have a negative association with age, implying that, on average, the older the individual, the lower the values of self-reported risk preferences. There is as of yet no clear consensus in the literature on whether the difference in risk preferences between men and women is due to sex or gender. However, most previous literature indicates that women are more risk-averse than men (Donkers et al., 2001; Weber et al., 2002; Croson and Gneezy 2009; Dohmen el al. 2011; Hardeweg et al., 2013; Beauchamp et al., 2015), whereas others do not find any difference (Brown Kruse and Thompson 2003; Harrison et al., 2007; Fraser-Mackenzie et al., 2014). A meta-analysis finds varying degrees of difference in risk attitudes between men and women depending on the context (Byrnes et al., 1999). This may also differ within the same context; for instance, varying the level of stakes in lottery-based risk questions alters the gender roles, where men become more risk-averse (Holt and Laury 2002). Or that women are more risk-averse in terms of lottery-based risk questions dealing with gains, but that no effect is found with regard to losses (Vieider et al., 2015). The descriptive statistics in Table 1 clearly show sex heterogeneity when it comes to self-assessment of risk attitudes: women's willingness to take risk is lower than that of men in all three risk contexts.

Dohmen et al., (2011) find a positive relationship between parental education and willingness to take risks. Approximately 18.5 percent of the cases in the sample have a

father who is literate.[11] Having (or having had) a literate father, compared to having an illiterate father, is positively related to a willingness to take risk in all three risk contexts.

Economic status may confound some of the associations of age, gender and parental background, which have been said to be largely exogenous. This is due to the fact that economic status might influence life expectancy, sex composition and parents' socioeconomic background. We use several indicators for economic status: welfare,[12] household consumption (measured at four different periods in a year), human capital (measured in level of education), having experienced food shortage during the last 12 months and having access to a bank account. Table 1 shows that human capital, having experienced food shortage and having a bank account are important indicators for risk attitudes. On average, the higher the level of education, the more willing individuals are to take risks; this is also noticeable with regard to having a bank account. Having experienced food shortage during the last 12 months is negatively related to a willingness to take risk (i.e. individuals on average take less risk if they have experienced food shortage).

Family structures have been hypothesized to impact risk attitudes; being married, for instance, is associated with risk aversion (Liebenehm et al., 2015). We include one factor within family structure: individuals' civil status. Those who are single report a higher willingness to take risk, and this is especially noticeable with regard to risk attitudes in traffic. Being a widower decreases respondents' risk attitudes in all three domains.

There is no doubt that certain occupations are riskier than others. Occupational risks may be measured in different ways, such as type of health hazards and in terms of economic risks (Bonin et al., 2007). In this study, we use occupational information. However, since a large majority of the respondents work in agriculture, we also include number of hours worked in the last 7 days. Table 1 does not show any particular difference between the different occupational categories listed in the table. Those who work more hours report a higher willingness to take risk in all three risk domains.

[11] In those instances where there is a missing value on father's literacy (which is more common for the older respondents), we have coded them as having a father who is (was) illiterate.
[12] Our welfare variable is constructed as a per capita variable of consumption within the household (i.e. total consumption divided by number of household members).

Table 1: Descriptive Statistics

	Obs.	Mean	SD	%	Mean					
					General		Traffic		Financial	
					Round		Round		Round	
					3	4	3	4	3	4
General (round 1)	31,677	4.06	2.19	-	-	-	-	-	-	-
General (round 2)	31,677	4.02	2.10	-	-	-	-	-	-	-
Traffic (round 1)	31,677	3.32	2.15	-	-	-	-	-	-	-
Traffic (round 2)	31,677	3.31	2.07	-	-	-	-	-	-	-
Financial (round 1)	31,677	4.65	2.31	-	-	-	-	-	-	-
Financial (round 2)	31,677	4.70	2.26	-	-	-	-	-	-	-
Sex										
Female	18,210	-	-	57.5	3.63	3.53	2.79	2.73	4.22	4.22
Male	13,467	-	-	42.5	4.64	4.70	4.04	4.09	5.24	5.36
Age										
18–29	11,907	-	-	37.6	4.16	4.19	3.60	3.67	4.68	4.79
30–39	7,294	-	-	23.0	4.31	4.27	3.53	3.47	5.03	5.08
40–49	4,932	-	-	15.6	4.18	4.15	3.28	3.24	4.91	4.99
50–59	3,515	-	-	11.1	3.91	3.83	3.00	2.97	4.56	4.54
60+	4,029	-	-	12.7	3.29	3.09	2.45	2.32	3.66	3.57
Father's literacy										
Literate	5,859	-	-	18.5	4.78	4.92	4.23	4.36	5.31	5.54
Illiterate	25,818	-	-	81.5	3.91	3.82	3.11	3.10	4.51	4.51
		-	-							
Education level										
Low/no	24,281	-	-	76.7	3.96	3.89	3.17	3.14	4.57	4.57
Primary	3,344	-	-	10.6	4.48	4.51	3.76	3.79	5.09	5.25
Secondary	3,624	-	-	11.4	4.32	4.39	3.82	3.87	4.81	5.01
University	428	-	-	1.4	4.46	4.55	4.01	4.07	4.83	5.12
Food shortage										
Yes	18,049	-	-	57.0	3.98	3.85	3.14	3.02	4.62	4.56
No	13,628	-	-	43.0	4.16	4.26	3.56	3.68	4.70	4.89
Bank account										
Yes	3,468	-	-	11.0	4.62	4.67	3.81	3.86	5.45	5.70
No	28,209	-	-	89.0	3.99	3.95	3.26	3.24	4.56	4.58
Family structure										
Single	5,705	-	-	18.0	4.37	4.43	4.03	4.07	4.77	4.94
Married	23,326	-	-	73.6	4.09	4.03	3.26	3.24	4.75	4.77
Divorced	363	-	-	1.1	3.79	3.94	2.96	3.14	4.39	4.73
Widowed	2,283	-	-	7.2	3.05	2.93	2.24	2.15	3.49	3.42
Employment sector										
Food Farming	21,080	-	-	66.5	4.06	4.00	3.32	3.30	4.68	4.67
Export & Ind. Farming	715	-	-	2.3	4.64	4.75	3.72	3.80	4.86	5.01
Breeding	313	-	-	1.0	4.31	4.38	3.60	3.58	4.87	5.14
Industry	653	-	-	2.1	4.13	4.12	3.09	3.08	4.96	5.05
Commerce	2,257	-	-	7.1	4.17	4.22	3.29	3.30	5.07	5.35
Manufacturing	308	-	-	1.0	4.34	4.54	3.73	3.87	5.37	5.56
Other occupation	2,736	-	-	8.6	4.54	4.62	3.85	3.90	5.14	5.41

No occupation	3,615	-	-	11.4	3.42	3.35	2.84	2.80	3.69	3.69
Hours worked during past week										
0 hours	3,647	-	-	11.5	3.43	3.37	2.85	2.81	3.70	3.71
1–20 hours	1,809	-	-	5.7	3.91	3.87	3.05	3.08	4.41	4.55
21–30 hours	4,176	-	-	13.2	3.87	3.91	3.05	3.06	4.44	4.58
31–40 hours	6,633	-	-	20.9	4.04	4.00	3.23	3.27	4.57	4.64
41–50 hours	8,563	-	-	27	4.18	4.18	3.49	3.51	4.88	4.92
50+ hours	6,849	-	-	21.7	4.41	4.32	3.68	3.56	5.15	5.14
Subjectively Poor										
Yes	19,298	-	-	61.0	3.98	3.94	3.26	3.24	4.56	4.61
No	12,379	-	-	39.1	4.19	4.15	3.42	3.40	4.81	4.84
Sick										
Yes	6,368			20.1	3.97	-	3.12	-	4.63	-
No	25,309	-	-	79.9	4.08	-	3.37	-	4.66	-
Disability										
Yes	1,269			4.0	3.51	3.48	2.76	2.76	3.88	3.91
No	30,408	-	-	96.0	4.08	4.05	3.34	3.33	4.69	4.74
Week of interview										
Before week 30	95	-	-	0.3	5.62	-	3.73	-	5.94	-
30	5,306	-	-	16.7	4.13	-	3.39	-	4.47	-
31	1,193	-	-	3.8	4.16	-	3.54	-	4.77	-
32	965	-	-	3.1	4.08	-	3.56	-	4.87	-
33	4,375	-	-	13.8	4.10	-	3.42	-	4.64	-
34	6,207	-	-	19.6	4.06	-	3.33	-	4.74	-
35	6,181	-	-	19.5	4.09	-	3.36	-	4.77	-
36	5,694	-	-	17.9	3.95	-	3.13	-	4.62	-
37	1,596	-	-	5.0	3.81	-	2.95	-	4.36	-
After week 37	65	-	-	0.2	4.55	-	3.88	-	4.66	-
Before week 42	289	-	-	0.9	-	4.72	-	3.93	-	5.09
42	5,651	-	-	17.8	-	4.05	-	3.38	-	4.70
43	6,251	-	-	19.7	-	4.03	-	3.35	-	4.67
44	5,475	-	-	17.3	-	3.86	-	3.20	-	4.55
45	6,918	-	-	21.8	-	4.01	-	3.27	-	4.69
46	5,621	-	-	17.7	-	4.13	-	3.39	-	4.90
47	1,166	-	-	3.7	-	4.14	-	2.86	-	4.75
After Week 47	306	-	-	0.97	-	3.65	-	3.27	-	4.06

Note: Shows number of observations, mean, standard deviation and share of total observations for each risk attitude and individual characteristics for rounds 3 and 4. The variable Sick has not been collected for the fourth round.

We also consider subjective attitudes toward own poverty. Table 1 on average shows a negative relationship with regard to willingness to take risk throughout all risk attitudes and among those who consider themselves as poor.

Last we have indicators on health status. The first indicator is whether or not the individual has been sick during the past 15 days. The second indicator is whether or not the individual has a disability of any sort (such as being blind, deaf or having reduced physical

ability, mental disability, etc.). We see that both health indicators constitute a small part of the sample. Those who are sick or have a disability report a lower willingness to take risk.

3.2 Stability of Risk Attitudes across Contexts

Table 2 shows the average responses for willingness to take risk in general, traffic and financial matters in round 3 and 4, as well as the average of the third and fourth round. The results in Table 2 indicate a clear difference in individuals' responses in their willingness to take risk in different contexts: individuals are on average more willing to take risk in financial matters, followed by general and finally traffic. Looking at the pairwise correlations in Table 2, we see that risk willingness in general has a high correlation with willingness to take risk in financial matters (approximately around correlation = 0.70–0.72 for the two time periods and the average of round 3 and 4) and in traffic (between correlation = 0.66–0.70 for round 3 and 4 and their average). However, the correlation between traffic and financial risk-taking is lower (correlation = 0.48, 0.49 and 0.52 for round 3, round 4 and the average of the third and fourth round). This indicates that willingness to take risk is correlated across contexts.

There are several reasons for this context-dependent variation in risk attitudes in Table 2. One reason could be that taking risk in traffic has more severe consequences than taking risk in financial matters. Furthermore, this variation in risk attitudes between contexts is sometimes explained in economics as a possible classical measurement error. The underlying assumption here is that individuals have one unique and stable risk preference (Harrison et al., 2005). However, within the field of psychology, the variation in risk attitudes is driven by contexts and content (Slovic 1972a,b; Weber et al., 2002; Hanoch and Gummerum 2010). The assumption is that individuals differ in their individual perception of risk attitudes depending on different contexts. A person may be quite willing to take risk in traffic compared to financial matters, whereas the opposite holds true for someone else. There is previous literature supporting this claim that risk-taking is dependent on context, such as traffic and financial matters (e.g. Byrnes et al., 1999; Weber et al., 2002).

Table 2: Correlation of Risk Attitudes across Contexts

Round 3				
	General	**Traffic**	**Financial**	**Observations**
General	1.0000			31,677
Traffic	0.6577***	1.0000		31,677
Financial	0.7012***	0.4794***	1.0000	31,677
Mean	4.061	3.319	4.654	31,677
Round 4				
	General	**Traffic**	**Financial**	**Observations**
General	1.0000			31,677
Traffic	0.6714***	1.0000		31,677
Financial	0.6981***	0.4942***	1.0000	31,677
Mean	4.025	3.306	4.702	31,677
Average Round 3 & 4				
	General	**Traffic**	**Financial**	**Observations**
General	1.0000			31,677
Traffic	0.6982***	1.0000		31,677
Financial	0.7220***	0.5158***	1.0000	31,677
Mean	4.042	3.313	4.678	31,677

Note: The Pearson correlations and mean values are based on individuals' risk attitudes within each domain for round 3 and 4, and the average of the third and fourth round.
*** Significant at the 1% level.

3.3 Association between Risk Attitudes and Individual Characteristics

In order to be able to determine the combined role of the different individual characteristics (described in Section 3.1) simultaneously, we continue our analysis by conducting regression estimations with risk attitudes as the dependent variable. We estimate our regressions using ordinary least squares (OLS) models and report robust standard errors that allow for

clustering at the household level.[13] Moreover, the results of our regressions confirm the relationships from our descriptive statistics in Section 3.1 and allow us to see if the interpretation of these regression estimates is in accordance with previous literature. More formally, our baseline regression estimations in Tables 3–5 are based on the following linear equation:

$$r_i = \beta_0 + \beta_1 \text{Female}_i + \beta_2 \text{Illiterate\_Father}_i + \beta_3 \text{Education}^T_i + \beta_4 X^T_i + e_i \quad (1)$$

where r_i is the risk attitude of individual i. The key independent variables are Female_i which indicates if individual i is female or not, Father_i which indicates if individual i's father is illiterate or not and the transpose Education^T_i is a set of individual level education variables[14] (primary, secondary, university level or not). The transpose X^T_i is a set of individual level control variables, including variables related to economic status, family structure, employment status, subjective attitudes, health status and time dummy variables.

Tables 3–5 show the coefficient estimates for general, traffic and financial risk attitudes as the dependent variables. The four first model specifications, as shown by models (1) to (4), use the average risk attitudes for the two rounds, while models (5) and (6) use self-reported attitudes for the third and fourth round, respectively.[15] Models (1) and (2) in Table 3 use sex and age as exogenous explanatory variables with respect to risk attitude. The estimates show that the unconditional results remain robust. Women are significantly less willing to take risks in general, and when breaking down risk attitudes by age groups, the results show that the older the individual, the more risk-averse and significantly less willing to take risk he or she becomes. The same trends are also shown for willingness to take risk in traffic and financial matters for models (1) and (2) in Table 4 and Table 5. These results are in line with Table 1. Moreover, model (3) includes a binary variable for whether or not the respondent's father is (was) literate. Having a literate father increases individuals' willingness to take risks in general, traffic and financial matters compared to having a farther who is not literate. As shown in Tables 3–5, the effect is significant. Models (4) to (6) show the result when including all other control variables in order to check the robustness of our estimations.

[13] We have also conducted the same regressions with interval, binary and Ordered Probit regression as a robustness check. In all cases we find similar qualitative results from the marginal effects. Before estimating all regressions using Probit and Ordered Probit models, we transformed our risk attitudes measurements from their 1 to 10 ordinal scale to a binary variable with 1–5 being 0 and 6–10 being 1, following a procedure similar to that in previous literature (such as Dohmen et al., 2011).

[14] Low/no education is a reference category.

[15] The stepwise inclusions of each co-variate for the third round, fourth round and the average of the third and fourth round are available upon request.

The result shows that individuals' own level of education does not seem to be an important predictor for risk attitudes in traffic and in general. However, there is a negative association between educational level and financial risk attitudes: individuals with higher levels of education tend to be less risk-taking than those with no education.

Table 3: Primary Determinants of Risk Attitudes in General

General	M1	M2	M3	M4	M5 (round 3)	M6 (round 4)
Female	-1.09***	-1.12***	-1.02***	-0.97***	-0.88***	-1.06***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Ref: 18–29 years						
30–39 years		0.09***	0.10***	0.06**	0.09***	0.03
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
40–49 years		-0.04	-0.02	-0.04	-0.01	-0.07*
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
50–59 years		-0.36***	-0.34***	-0.32***	-0.27***	-0.39***
		(0.03)	(0.03)	(0.04)	(0.05)	(0.04)
60+ years		-1.06***	-1.02***	-0.86***	-0.73***	-0.99***
		(0.03)	(0.03)	(0.04)	(0.05)	(0.05)
Ref: Illiterate, Father						
Literate, Father			0.25***	0.17***	0.12**	0.21***
			(0.04)	(0.04)	(0.05)	(0.04)
Ref: Low/no education						
Primary level				0.11***	0.14**	0.09*
				(0.04)	(0.05)	(0.05)
Secondary level				-0.08*	-0.05	-0.11**
				(0.05)	(0.06)	(0.05)
University level				-0.16	-0.13	-0.24*
				(0.13)	(0.15)	(0.14)
Economic Status	No	No	No	Yes	Yes	Yes
Family Structure	No	No	No	Yes	Yes	Yes
Employment Status	No	No	No	Yes	Yes	Yes
Subjective attitudes	No	No	No	Yes	Yes	Yes
Health Status	No	No	No	Yes	Yes	Yes
Time dummies (weekly)	No	No	No	Yes	Yes	Yes
Constant	4.67***	4.84***	4.73***	3.83***	5.50***	2.18***
	(0.02)	(0.03)	(0.03)	(0.51)	(0.63)	(0.58)
Observations	31,677	31,677	31,677	31,620	31,620	31,620
R-squared	0.084	0.123	0.125	0.143	0.089	0.134
OLS	Yes	Yes	Yes	Yes	Yes	Yes

Note: Shows coefficient estimates (OLS) for general risk attitudes. Models (1) to (4) use the average risk attitude in general between round 3 and 4 as the dependent variable. Models (5) and (6) use risk attitude in general as the dependent variable for round 3 and round 4 separately. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general. Welfare and consumption controls (within economic status) are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant. For more detailed information on the control variables, see extended Table A1 in the Appendix.

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level.

Table 4: Primary Determinants of Risk Attitudes in Traffic

Traffic	M1	M2	M3	M4	M5 (round 3)	M6 (round 4)
Female	-1.31***	-1.35***	-1.23***	-1.20***	-1.15***	-1.26***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Ref: 18–29 years						
30–39 years		-0.16***	-0.15***	-0.07***	-0.01	-0.15***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
40–49 years		-0.41***	-0.38***	-0.28***	-0.22***	-0.35***
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
50–59 years		-0.72***	-0.69***	-0.57***	-0.52***	-0.65***
		(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
60+ years		-1.34***	-1.30***	-1.12***	-1.01***	-1.25***
		(0.03)	(0.03)	(0.04)	(0.05)	(0.04)
Ref: Illiterate, Father						
Literate, Father			0.29***	0.17***	0.11**	0.24***
			(0.04)	(0.04)	(0.05)	(0.04)
Ref: Low/no education						
Primary level				0.10**	0.12**	0.06
				(0.04)	(0.05)	(0.04)
Secondary level				0.00	0.04	-0.04
				(0.05)	(0.06)	(0.05)
University level				0.05	0.09	-0.03
				(0.14)	(0.16)	(0.14)
Economic Status	No	No	No	Yes	Yes	Yes
Family Structure	No	No	No	Yes	Yes	Yes
Employment Status	No	No	No	Yes	Yes	Yes
Subjective attitudes	No	No	No	Yes	Yes	Yes
Health Status	No	No	No	Yes	Yes	Yes
Time dummies (weekly)	No	No	No	Yes	Yes	Yes
Constant	4.06***	4.44***	4.30***	7.19***	8.08***	6.44***
	(0.02)	(0.03)	(0.03)	(0.49)	(0.59)	(0.56)
Observations	31,677	31,677	31,677	31,620	31,620	31,620
R-squared	0.124	0.182	0.185	0.212	0.139	0.187
OLS	Yes	Yes	Yes	Yes	Yes	Yes

Note: Shows coefficient estimates (OLS) for risk attitudes in traffic. Models (1) to (4) use the average risk attitude in traffic between round 3 and 4 as the dependent variable. Models (5) and (6) use risk attitude in traffic as the dependent variable for round 3 and round 4 separately. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in traffic. Welfare and consumption controls (within economic status) are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant. For more detailed information on the control variables, see extended Table A2 in the Appendix.

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level.

Table 5: Primary Determinants of Risk Attitudes in Financial matters

Financial	M1	M2	M3	M4	M5 (round 3)	M6 (round 4)
Female	-1.08***	-1.11***	-1.06***	-0.97***	-0.93***	-1.02***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Ref: 18–29 years						
30–39 years		0.30***	0.30***	0.15***	0.17***	0.12***
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
40–49 years		0.19***	0.20***	0.06	0.06	0.05
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
50–59 years		-0.25***	-0.23***	-0.32***	-0.27***	-0.37***
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
60+ years		-1.19***	-1.17***	-0.99***	-0.92***	-1.07***
		(0.04)	(0.04)	(0.05)	(0.06)	(0.05)
Ref: Illiterate, Father						
Literate, Father			0.14***	0.06	0.01	0.11**
			(0.04)	(0.04)	(0.05)	(0.04)
Ref: Low/no education						
Primary level				0.11**	0.12**	0.10**
				(0.04)	(0.05)	(0.05)
Secondary level				-0.15***	-0.12**	-0.18***
				(0.05)	(0.06)	(0.06)
University level				-0.31**	-0.32**	-0.37***
				(0.13)	(0.15)	(0.14)
Economic Status	No	No	No	Yes	Yes	Yes
Family Structure	No	No	No	Yes	Yes	Yes
Employment Status	No	No	No	Yes	Yes	Yes
Subjective attitudes	No	No	No	Yes	Yes	Yes
Health Status	No	No	No	Yes	Yes	Yes
Time dummies (weekly)	No	No	No	Yes	Yes	Yes
Constant	5.30***	5.40***	5.33***	4.09***	5.35***	2.83***
	(0.02)	(0.03)	(0.03)	(0.51)	(0.63)	(0.58)
Observations	31,677	31,677	31,677	31,620	31,620	31,620
R-squared	0.076	0.130	0.131	0.168	0.110	0.143
OLS	Yes	Yes	Yes	Yes	Yes	Yes

Note: Shows coefficient estimates (OLS) for risk attitudes in financial matters. Models (1) to (4) use the average risk attitude in financial matters between round 3 and 4 as the dependent variable. Models (5) and (6) use risk attitude in financial matters as the dependent variable for round 3 and round 4 separately. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in financial matters. Welfare and consumption controls (within economic status) are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant. For more detailed information on the control variables, see extended Table A3 in the Appendix.

* Significant at the 10% level, ** Significant at the 5% level, *** Significant at the 1% level.

To summarize: looking at sex differences, we see that women are significantly less willing to take risk in all three risk contexts compared to men, with a somewhat less risk-taking attitude in traffic. Furthermore, higher age results in a lower willingness to take risk. Literate fathers have a positive and significant impact on willingness to take risk with a

stronger effect in traffic, which is also related to accessibility to vehicles. The relationship between level of education and risk attitudes in financial matters shows a pattern toward a lesser willingness to take risk as the level of education increases. Thus, we see that these factors are important in determining willingness to take risk, also when we add all of the controls.

3.4 Stability of Risk Measures across Time

So far, we have analyzed the combined role of the different individual characteristics on risk attitudes across domains. One important factor here is the stability of our estimates, which may be analyzed by looking at the difference in risk attitudes between two time points.

Let us take sex as an example, which is the most important factor for risk attitudes; not only as indicated by the magnitude of its coefficient, but also by the fact that sex has the largest contribution to the R-square among all of the covariates. Table 3 shows that the coefficient for female is -0.88 in the third round and -1.06 in the fourth round, thus implying a 17 percent difference (1-(0.88/1.06)=0.17) for general risk attitudes. The corresponding percentage for both traffic and financial matters is approximately 9 percent. Table 3 also shows a difference in R-square between general risk attitudes in the third (model 5) and fourth round (model 6): 0.089 and 0.134 (the corresponding R-square values for traffic are 0.139 and 0.187, while they are 0.110 and 0.143 for financial risk attitudes). Using the average value for two time periods (as model 4 in Table 3–5) seems to be an appropriate way of reducing and making the estimates more stable. This is also highlighted by the fact that the R-square of model (4) is higher than that of models (5) and (6).

All in all, the explanatory power of our model increases when we use the average value for the two time periods. This is an indication that our measurement becomes more stable, independent of whether the change in self-reported risk attitudes between the two time periods is due to a classical measurement error (Beauchamp et al., 2015) or an exogenous event impacting individual risk attitudes (Burns et al., 2012; Dohmen et al., 2016). However, as we do not use risk attitudes as independent variables in this study, we do not have to address measurement errors.

4. Reliability of Risk Measurements

Previous findings on self-reported risk question have been able to find important insights about individual's risk attitudes[16], but they have lacked the sample size, geographic variation and or panel structure to test and analyze the reliability of risk attitudes. Whether or not a measurement is reliable is a crucial element in any sort of inference, as we as researchers want to be able to suggest that our findings constitute evidence of a relationship between two phenomena. One approach of measuring reliability is by asking the same individual the same question repeatedly within a set time period and then analyze the difference between his or her responses. This is a common method for getting a measure of reliability that is also known as a test-retest analysis. It is typically assumed that experiment and survey measures capturing risk preferences are reliable, i.e. that their results are reproducible and measurement error is small. However, the actual reliability of these measurements is largely unknown. Knowledge about reliability is important. If reliability is low, elicited risk preferences through one measurement cannot be expected to provide us with accurate assessments about the risk preferences we want to capture (Wölbert and Riedl, 2013).

In this study, we present two different measurements of test-retest reliability. First, a Pearson correlation, which assumes that the risk measurements are continuous and has been used previously by Dohmen et al., (2016) and Lönnqvist et al (2015). Second, a test-retest measurement obtained through deriving the polychoric correlation,[17] which assumes that the risk measurement is measured on an ordinal scale, but continuous in nature. Since our risk variables are measured on an ordinal scale, the polychoric correlation is preferred over the Pearson correlation, the former has also been used previously by Beauchamp et al., (2015).[18] If the correlation is high, then the measurement has a high level of reliability.

4.1 Test-Retest Reliability Results

Panel A in Table 6 shows the estimates for our two test-retest reliability measurements and their corresponding 95 % confidence intervals in the context of general, traffic and financial

[16] Such as Weber et al., 2002; Caliendo et al., 2009; Bonin et al., 2007; Budria et al., 2009; Dohmen et al., 2010; Ding et al., 2010; Dohmen et al., 2011; Hanoch and Gummerum, 2010; Guiso et al., 2013; Wölbert and Riedl, 2013; Tanaka and Munro 2013; Hardeweg et al., 2013; Beauchamp et al., 2015; Liebenehm et al., 2015; Lönnqvist et al., 2015; Vieider et al., 2015; Highhouse et al., 2016; Dohmen et al., 2016; Jin et al., 2017; Grönlund & Magnusson 2017.

[17] The term polychoric correlation refers to all correlations based on ordinal variables that measure an (assumable) continuous underlying variable. In our case, we asked respondents to self-assess their risk attitudes on a scale from 1 to 10. However, risk attitudes may be considered continuous in nature.

[18] For a technical derivation of the test-retest reliability, see Beauchamp et al., (2015).

matters. These three test-retest reliability measures were computed by calculating the Pearson correlation and the polychoric correlation for the same individuals who answered all three risk survey questions twice, meaning once in the third and the fourth round. First, we see that the values for the Pearson and polychoric correlations are quite close. Second, both correlation measurements show the same pattern: the highest correlation is obtained for traffic, then in general and finally in financial matters. The values for the test-retest reliabilities across context are not large. We also observe the preciseness of our estimates indicated by the 95% confidence intervals. As a robustness check, we drop observations with an extreme difference between their answers in round 3 and 4 (i.e. the responses that differ more than five scale points in absolute values[19]), as shown in Panel B in Table 6. We see that our test-retest reliability measures increase in magnitude even though the pattern is the same, where taking risk in traffic or in general give the highest scores.

Table 6: Estimates of Test-Retest Reliabilities for Risk Attitudes (Whole Sample)

	Polychoric	**Pearson**	**Observations**
		***Panel A:* All responses**	
General	0.53	0.50	31,677
95% C.I.	*0.52–0.53*	*0.49–0.50*	
Traffic	0.57	0.51	31,677
95% C.I.	*0.56–0.57*	*0.50–0.52*	
Financial	0.48	0.45	31,677
95% C.I.	*0.47–0.49*	*0.44–0.46*	
		***Panel B:* Responses within |5| scale points**	
General	0.60	0.56	31,050
95% C.I.	*0.59–0.60*	*0.55–0.57*	
Traffic	0.64	0.59	30,961
95% C.I.	*0.63–0.64*	*0.58–0.59*	
Financial	0.58	0.55	30,666
95% C.I.	*0.57–0.58*	*0.54–0.55*	

Note: Shows test-retest reliability estimates (polychoric and Pearson) and their corresponding 95% confidence interval for risk-taking in general, traffic and financial matters. Panel A shows the test-retest estimates for the whole sample and Panel B shows the restricted sample where we have removed the extreme values within each risk context and only look at those individuals that have an absolute difference of 5 scale points between round 3 and 4.

[19] Correspondence to approximately 5.8 percent of the sample size.

We have only been able to find three previous studies performing test-retest reliability analysis for similar risk attitudes measurements, which we may then use for comparing our estimates: i.) Dohmen et al., (2016) use the German socioeconomic panel data with a test-rest sample size of 300 individuals, ii.) Beauchamp et al., (2015) use the Swedish Twin Panel Survey with approximately 494 individuals, which is also the only previous study so far to use polychoric correlation for our kind of risk measurements, and iii.) Lönnqvist et al (2015) which uses a panel survey from laboratory experiments with a sample size of 44 individuals. The results of these three studies are illustrated in Table 7.[20] To begin with, Beauchamp et al., (2015) report a test-retest polychoric correlation of 0.63 for the willingness to take risk in general for a sample of Swedish twins, whereas we obtain a correlation of 0.53. The test-retest coefficient obtained by Dohmen et al., (2016) for the willingness to take risk in general is 0.61. Lönnqvist et al., (2015) obtained a much higher value: 0.77. When comparing our result for willingness to take risk in traffic with that of Lönnqvist et al., (2015), there is no difference; we get a correlation of 0.57, which is the same as theirs. Our result for willingness to take risk in financial matters is 0.48, 0.55 for Lönnqvist et al., (2015) and 0.67 for Beauchamp et al., (2015).

Table 7: Test-Retest Reliabilities for Risk Attitudes, Comparison with Previous Studies

	General	Traffic	Financial	n	Method
Burkina Faso	0.53	0.57	0.48	31,677	Polychoric
Beauchamp et al., (2015)	0.63	…	0.67	494	Polychoric
Dohmen et al., (2016)	0.61	…	…	300	Pearson
Lönnqvist et al., (2015)	0.77	0.57	0.55	44	Pearson

Note: Shows the test-retest reliability estimates from previous studies compared to our results from the whole sample for risk attitudes in general, traffic and financial matters.

Overall, as indicated in Table 7, our results are somewhat lower than the previous studies, but we do not detect any large differences between the test-retest analyses for our sample compared to the previous results. There are several reasons as to why the results of the previous studies are somewhat higher than ours. First, our sample is a representative sample of the population, while the previous studies have used samples that may be more homogeneous, such as twin studies, students or pilot studies. This is also evident

[20] There are studies that look at the stability of incentivized risk preferences, such as lottery or/and experiments (for a literature overview, see Chuang and Schechter (2015)). However, since the focus of this study is on self-reported risk attitudes, we only include studies with an approach similar to ours.

when comparing a more homogenous part of our sample (Panel B, Table 6) with previous studies. Then our results increase and tend to be more similar to previous studies. The fact that we examine a developing country (which has a lower level of education) may also affect the results.

4.2 Test-Retest Reliability Analysis across Subgroups

As mentioned earlier, a strength of this study is its large sample size. Therefore, we are able to break down the sample into different subgroups in order to detect how the test-retest reliability is affected by the factors described in Section 3.1. Figure 3 and 4 visually illustrate the results of the test-retest reliability analysis.[21]

Figure 3 shows the test-retest analysis for women and men. We see that there is a significant difference (i.e. the 95 % confidence intervals do not overlap) between women and men for all three risk attitudes: the polychoric correlations are higher for women.

Figure 3 shows that here is no significant age-cohort effect on the test-retest estimates, which also do not exhibit any large differences for the polychoric correlations.

Figure 3 shows the test-retest analysis of the literacy of the respondents' father. Respondents with a literate father tend to have lower polychoric correlations than those with an illiterate father. However, the pattern is reverse when it comes to the individuals' own level of education; as shown in Figure 3, the polychoric correlation increases with the level of education. But as the confidence intervals overlap, we only see a significant difference in financial matters between those with low and the highest levels of education.

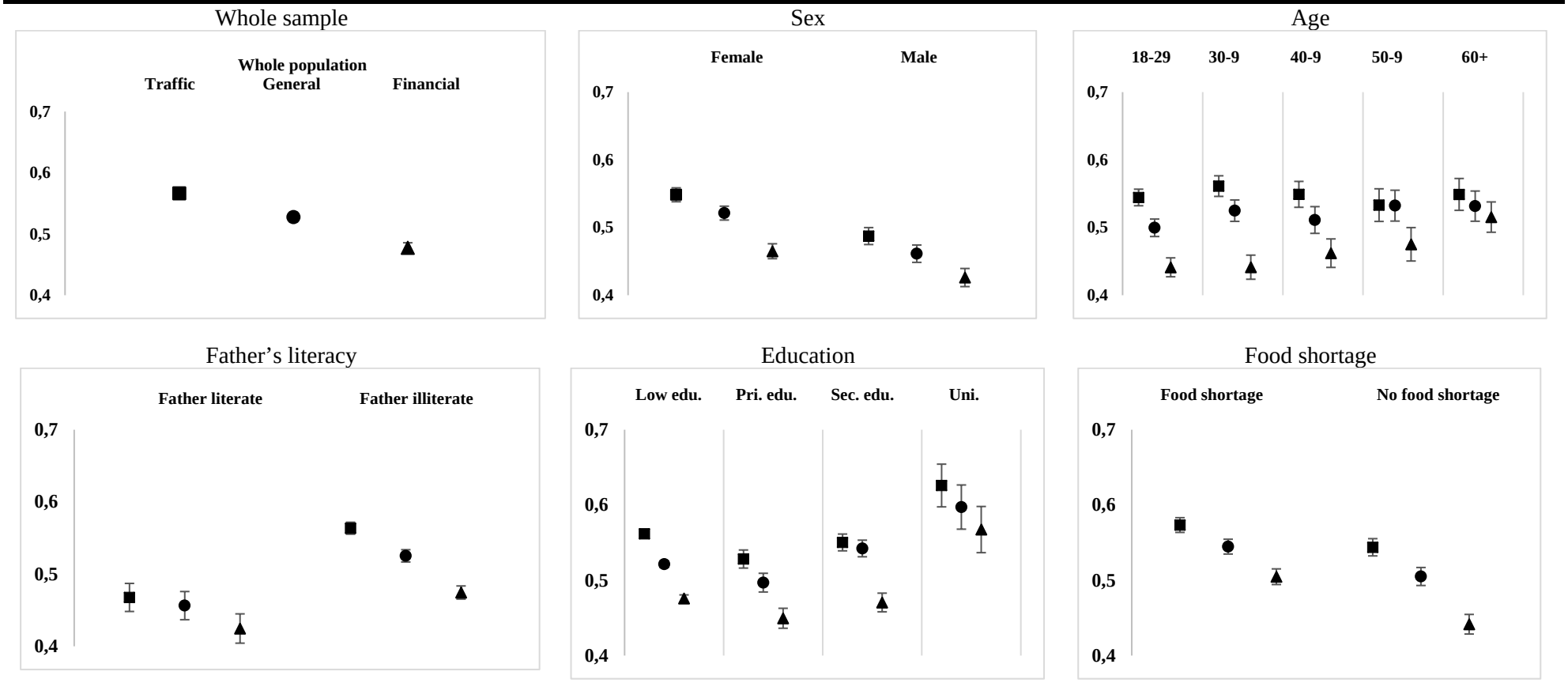
Figure 3 shows polychoric correlations for individuals having experienced food shortage during the last 12 months. There is a significant difference between those experiencing food shortage and those who do not: the polychoric correlations are higher for those with food shortage.

As shown in Figure 4, with regard to risk-taking in general and traffic, having a bank account affects the test-retest estimates significantly compared to not having access to a bank account.

Figure 4 shows a significant difference in the test-retest estimates between those not working and those working the most, above 50 hours per week. This effect is still valid when looking at Figure 6.

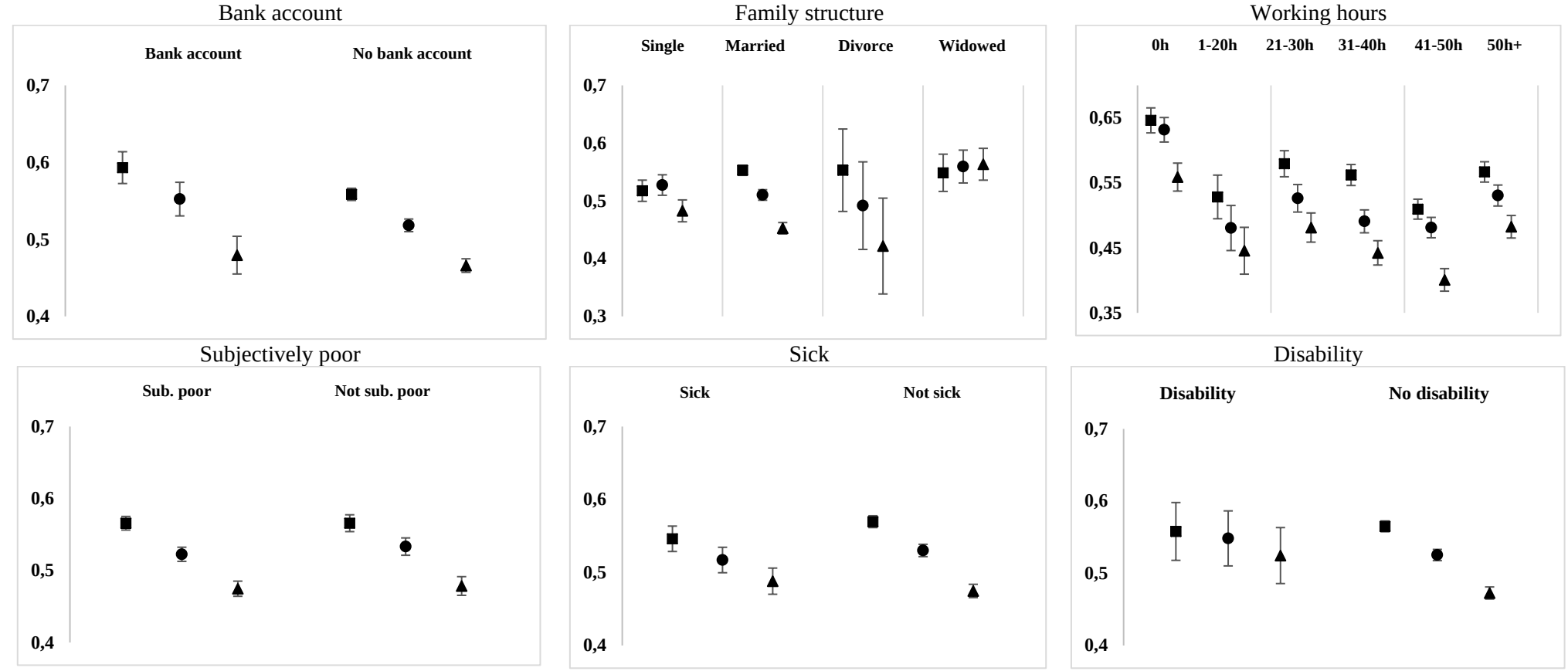
[21] Detailed results about each figure is available upon request.

Figure 3: Estimates of Test-Retest Reliabilities for Risk Attitudes (Polychoric)



Note: Shows test-retest reliability estimates (polychoric) and their corresponding 95% confidence interval for risk-taking in traffic (■), general (●) and financial matters (▲) for the whole sample and the different subgroups: Sex, Age, Father's literacy, Education and Food shortage.

Figure 4: Estimates of Test-Retest Reliabilities for Risk Attitudes (Polychoric)



Note: Shows test-retest reliability estimates (polychoric) and their corresponding 95% confidence interval for risk-taking in traffic (■), general (●) and financial matters (▲) for the different subgroups: Bank account, Family structure, Working hours, Subjectively poor, Sick and Disability.

4.3 Characteristics of the Extreme Values

As mentioned above, Panel B in Table 6 shows estimates of the test-retest reliability for our sample without the observations exhibiting an extreme difference in their answers in round 3 and 4.[22] In this section, we take a closer look at these extreme responses for our three risk domains as a robustness check in order to understand the stability of our test-retest results.

4.3.1 Descriptive Statistics of Extreme Risk attitudes

Extreme responses in risk attitudes between two periods may be due to many factors, but are most likely due to measurement errors or actual changes in risk attitudes. It is therefore important to analyze whether our risk questions are reliable, in particular with extreme responses in risk attitudes. Table 8 divides the sample into extreme responses between round 3 and 4 (Panel A) and without extreme responses (Panel B) for willingness to take risk in traffic, in financial matters and in general. Panel A in Table 8 shows that the number of extreme responses is the highest in financial matters (1,011 observations), followed by traffic (716) and in general (627). It is reasonable that there are less extreme responses in risk attitudes in traffic and general compared to financial matters, since it is possible to be more extreme in one's risk attitudes in financial matters compared to traffic.

Furthermore, Table 8 shows that certain characteristics are more prominent in the extreme responses. These characteristics have a strong association with risk-taking. For instance, a larger share of men is seen in the extreme responses (Panel A) than without extreme responses (Panel B). We also see that the share of individuals with access to a bank account is larger in the extreme responses (Panel A) compared to the whole sample (Panel B). Individuals that have (had) a literate father constitute a larger share of the extreme responses compared to the whole sample. Moreover, we see that a smaller share of the sample of extreme responses has been affected by food shortage during the past 12 months.

[22] These extreme responses are individuals whose responses differ more than five scale points in absolute values between the third and fourth round in all three risk domains.

Table 8: Primary Determinants of Risk Attitudes in Financial matters

	Panel A: Only extreme responses						Panel B: Without extreme responses					
	Traffic	**Traffic**	**Financial**	**Financial**	**General**	**General**	**Traffic**	**Traffic**	**Financial**	**Financial**	**General**	**General**
	Obs.	**%**	**Obs.**	**%**	**Obs.**	**%**	**Obs.**	**%**	**Obs.**	**%**	**Obs.**	**%**
Male	716	0.59	1,011	0.48	627	0.56	30,961	0.42	30,666	0.42	31,050	0.42
Literate father	716	0.28	1,011	0.20	627	0.24	30,961	0.18	30,666	0.18	31,050	0.18
Food shortage	716	0.41	1,011	0.51	627	0.49	30,961	0.57	30,666	0.57	31,050	0.57
No food shortage	716	0.59	1,011	0.49	627	0.51	30,961	0.43	30,666	0.43	31,050	0.43
Bank account	716	0.14	1,011	0.13	627	0.13	30,961	0.11	30,666	0.11	31,050	0.11
Single	716	0.24	1,011	0.15	627	0.19	30,961	0.18	30,666	0.18	31,050	0.18
41-50h work/week	716	0.33	1,011	0.32	627	0.32	30,961	0.27	30,666	0.27	31,050	0.27
Sick	716	0.25	1,011	0.22	627	0.27	30,961	0.20	30,666	0.20	31,050	0.20

Note: Shows number of observations and share of total observations for the independent variables. Panel A is the total sample of only the extreme responses and Panel B is the total sample without the extreme responses for willingness to take risk in traffic, financial matters and in general. Extreme responses are individuals whose responses differ more than five scale points in absolute value between round 3 and 4. Variables that do not exhibit large differences between panel A and B (i.e. less than 10% change between panel A and B) are excluded from the table (they are available upon request).

4.3.2 Association between Extreme Risk Attitudes and Individual Characteristics

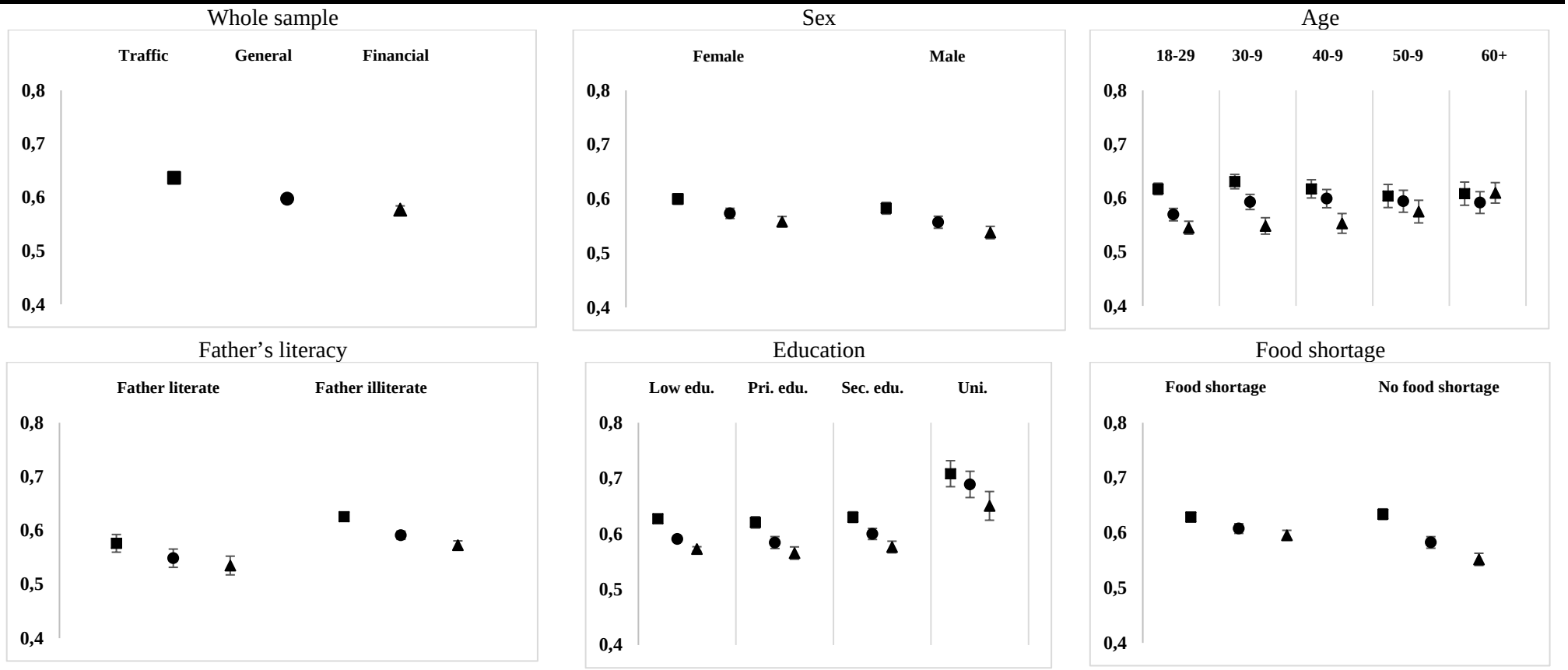
As the first step in our attempt to understand the association between extreme risk attitudes and individual characteristics, we observe that the majority of individuals only have extreme risk attitude responses with regard to one domain (1,466 observations or 79 percentage of extreme responses). For instance, extreme responses in financial matters but not in traffic or general. Only 6 percentage of individuals (108 observations) provide extreme responses with regard to all of their risk attitudes (i.e. are more extreme risk-takers in traffic, in financial matters and in general).[23] These numbers indicate that there may not be a single underlying trait for risk attitudes. Otherwise, the proportions would be the other way around. That would for instance mean that the individuals providing extreme responses for risk-taking in general between the third and the fourth round would exhibit the same trait with regard to a willingness to take risk in traffic and financial matters. However, as we discover, this is only evident for 6 percent of those individuals.

As a second step in understanding the association between risk attitudes and individual characteristics, we have calculated the test-retest reliability estimates without including the individuals providing extreme responses between the third and fourth round. Figures 5 and 6 show these reliability estimates. Looking at the whole sample without extreme responses, Figure 5 indicates that our risk measurements become more reliable when excluding the extreme response (i.e. the test-retest reliability estimates increase between Figures 3 and 5). If we were to only concentrate on the subgroup of sex, then we see in Figure 5 a similar relationship as previously – an increase in reliability compared to Figure 3. Furthermore, the difference between the test-retest estimates for women and men decreases in Figure 5, which is a result of the large share of men in the extreme responses as indicated in Table 8 that are now dropped from the sample.

The removal of the extreme responses also affect the test-retest reliability estimates in other subgroups. Figure 6 shows that compared to Figure 4, the reliability measurements increase even more for those with access to a bank account when it comes to risk-taking in general and in traffic. The same pattern is also detected for the individual's father's level of literacy. Removing the extreme responses, as indicated by Figure 5, increases the reliability estimates compared to Figure 3.

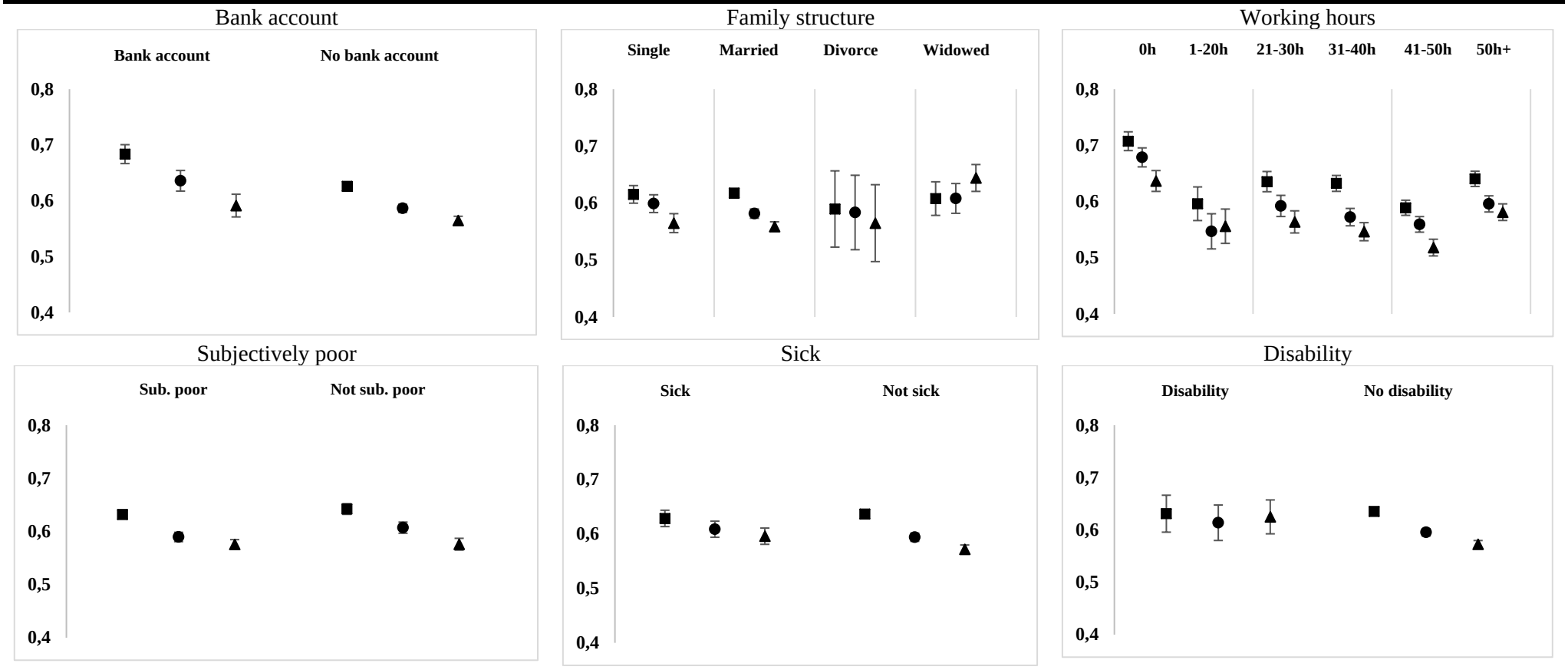
[23] The detailed results are available upon request.

Figure 5: Estimates of Test-Retest Reliabilities for Risk Attitudes without Extreme Responses (Polychoric)



Note: Shows test-retest reliability estimates (polychoric) and their corresponding 95% confidence interval for risk-taking in traffic (■), general (●) and financial matters (▲) for the whole sample and the different subgroups: Sex, Age, Father's literacy, Education and Food shortage. The sample does not contain extreme responses.

Figure 6: Estimates of Test-Retest Reliabilities for Risk Attitudes without Extreme Responses (Polychoric)



Note: Shows test-retest reliability estimates (polychoric) and their corresponding 95% confidence interval for risk-taking in traffic (■), general (●) and financial matters (▲) for the different subgroups: Bank account, Family structure, Working hours, Subjectively poor, Sick and Disability. The sample does not contain extreme responses.

5. Conclusion

In this paper, we have investigated individual's risk attitude in sub-Saharan Africa. We examined a large nationally representative sample of 31 677 individuals from Burkina Faso with data collected on risk attitudes. We have made multiple contributions about the determinants of risk taking and the reliability of self-reported risk measures, in an effort to learn more about individual's risk attitudes in sub-Saharan Africa.

Our findings are in line with previous research about the determinants of risk attitudes (e.g. Weber et al., 2002; Dohmen et al., 2011; Hardeweg et al., 2013; Lönnqvist et al., 2015; Vieider et al., 2015; Beauchamp et al., 2015). We find that willingness to take risk is significantly associated with sex and age. Women tend to report to be less risk-taking than men. Older respondents respond that they are less risk-taking than younger respondents are. While other determinants, such as parents' (and own) level of education, economic status, health and/or marital status are also significantly associated with individuals' risk taking, their contribution as a determinant of risk attitudes are not as large as sex and age.

We find support for the argument that risk attitudes are context-specific, which is in line with previous literature in economics and psychology (Weber et al., 2002; Vlaev et al., 2010; Dohmen et al., 2011; Beauchamp et al., 2015; Highhouse et al., 2016). For instance, women (and older individuals) are less willing than men (and younger individuals) to take risk in traffic than both in general and financial matters.

Estimating the test-retest reliability of 31 677 individuals self-reported risk measurements in general, traffic and financial matters, we find that the reliability of our measures are quite stable. Comparing our results to previous homogenous small-scaled studies from developed countries, we conclude that our results are somewhat lower than those found in Sweden (Beauchamp et al., 2015) and Germany (Dohmen et al., 2016; Lönnqvist et al., 2015). There are several reasons as to why our results are somewhat lower than previous studies. First previous studies have used more homogenous samples than our sample (such as twin studies, lab experiments with students and pilot studies). When restricting our sample to a more homogenous sub-sample, our results become similar and in some instances have higher reliability scores than previous results (ibid). Another reason could be that we focus on a sub-Saharan African developing country, which has on average lower educational level than Sweden and Germany. Our large sample size makes this study unique, as it provides the statistical power necessary to analyze the reliability of risk measures for different sub-groups, such as sex, literacy, family structure and subjective attitudes but also economic, employment

and health status. Our results show a higher level of reliability for women compared to men, university graduates than individuals with other educational attainments and those who have a bank account compared to those without one. Our findings do not exhibit any significant difference of reliability for subgroups such as different age groups, family structure, been sick during the last 15 days, having a disability of any sort or for different working hours.

Why is all this important? Well almost every economic decision-making involves some degree of risk-taking, yet it is only in recent years that economists have started to analyze the nature of individual's risk attitudes and how it should be measured. There are many different ways to eliciting risk preferences (for an overview see Charness et al., 2013). There are those who argue that risk preferences should be elicited by incentive methods (e.g. Hold and Laury 2002), since otherwise there is no incentive for individuals to reveal their true risk preferences. Self-reported risk question in surveys have been proven to capture individuals risk preference in developed countries (e.g. Dohmen et al., 2011; Lönnqvist et al., 2015), emerging countries (e.g. Hardeweg et al., 2013), developing countries and comparatively for 30 countries (Vieider et al., 2015). However, to the best of our knowledge, there are no studies in sub-Saharan African countries focusing on the reliability of different self-reported risk attitudes. This study reduces the gap in the literature about the reliability of self-reported risk questions. Thus, there are two main suggestion for those interested in measuring risk attitudes in sub-Saharan Africa. First, the results of this study indicate that having a self-reported question about willingness to take risk in general could be a good proxy for other risk contexts. But if the research question depends on it, then context-specific risk measurements should be included. Second and most importantly, those researchers who would like to focus on individual's risk attitudes but have limited resources to collect an incentivized risk measurement could capture economic behavior through self-reported survey questions concerning risk. Self-reported risk not only has high validity, as previous research has shown, but as this study shows the reliability is also satisfactory.

Overall, this paper contributes to the emerging line of research focusing on understanding and predicting individual risk attitudes in sub-Saharan Africa. Using more reliable risk measures will be important for future research attempting to learn more about individual's risk attitudes in sub-Saharan Africa.

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Appendix

Table A1 (extended): Primary Determinants of Risk Attitudes in General

General	M1	M2	M3	M4	M5 (round 3)	M6 (round 4)
Female	-1.09***	-1.12***	-1.02***	-0.97***	-0.88***	-1.06***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Ref: 18-29 years						
30-39 years		0.09***	0.10***	0.06**	0.09***	0.03
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
40-49 years		-0.04	-0.02	-0.04	-0.01	-0.07*
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
50-59 years		-0.36***	-0.34***	-0.32***	-0.27***	-0.39***
		(0.03)	(0.03)	(0.04)	(0.05)	(0.04)
60+ years		-1.06***	-1.02***	-0.86***	-0.73***	-0.99***
		(0.03)	(0.03)	(0.04)	(0.05)	(0.05)
Ref: Illiterate, Father						
Literate, Father			0.25***	0.17***	0.12**	0.21***
			(0.04)	(0.04)	(0.05)	(0.04)
Ref: Low/no education						
Primary level				0.11***	0.14**	0.09*
				(0.04)	(0.05)	(0.05)
Secondary level				-0.08*	-0.05	-0.11**
				(0.05)	(0.06)	(0.05)
University level				-0.16	-0.13	-0.24*
				(0.13)	(0.15)	(0.14)
Log_ Food cons.2014				-0.00	-0.07	0.07
				(0.05)	(0.06)	(0.06)
Log_Non-food cons.2014				0.03	0.05	0.02
				(0.05)	(0.05)	(0.05)
Log_Welfare				0.04	-0.04	0.12*
				(0.06)	(0.08)	(0.07)
Ref: No food shortage						
Food shortage				-0.19***	-0.08*	-0.29***
				(0.04)	(0.05)	(0.04)
Ref: No bank account						
Bank account				0.19***	0.24***	0.16***
				(0.05)	(0.06)	(0.05)
Ref: Single						
Married				-0.03	-0.03	-0.01
				(0.04)	(0.05)	(0.04)
Divorced				-0.06	-0.17	0.07
				(0.10)	(0.12)	(0.12)
Widowed				-0.12*	-0.20***	-0.03
				(0.06)	(0.08)	(0.07)
# of Household members				-0.01	-0.02*	-0.01
				(0.01)	(0.01)	(0.01)
Ref: No Occupation						
Food Farming				0.25***	0.19***	0.31***
				(0.06)	(0.07)	(0.07)
Export&Industrial Farming				0.71***	0.57***	0.83***
				(0.12)	(0.14)	(0.14)
Breeding				0.23*	0.16	0.31**
				(0.12)	(0.16)	(0.13)

Industry				0.22**	0.14	0.29***
				(0.10)	(0.12)	(0.11)
Commerce				0.26***	0.16*	0.34***
				(0.07)	(0.09)	(0.08)
Manufacturing				0.14	-0.01	0.28*
				(0.13)	(0.15)	(0.15)
Other occupation				0.19***	0.12	0.25***
				(0.07)	(0.09)	(0.08)
# **of Hours worked**				0.00***	0.00***	0.00
				(0.00)	(0.00)	(0.00)
Ref: Not subjectively poor						
Subjectively Poor				-0.17***	-0.22***	-0.13***
				(0.04)	(0.05)	(0.04)
Ref: Not sick						
Sick				0.01	0.02	-
				(0.03)	(0.03)	-
Ref: No disability						
Disability				-0.23***	-0.26***	-0.19***
				(0.06)	(0.07)	(0.07)
Ref: Week 30						
Before Week 30					1.54***	
					(0.33)	
Week 31					-0.02	
					(0.13)	
Week 32					-0.13	
					(0.14)	
Week 33					-0.05	
					(0.08)	
Week 34					-0.07	
					(0.07)	
Week 35					-0.06	
					(0.07)	
Week 36					-0.17**	
					(0.07)	
Week 37					-0.30***	
					(0.10)	
After Week 37					0.40	
					(0.44)	
Ref: Week 42						
Before Week 42				0.50***		0.61***
				(0.16)		(0.18)
Week 43				0.00		0.01
				(0.06)		(0.07)
Week 44				-0.09		-0.15**
				(0.06)		(0.07)
Week 45				-0.05		-0.01
				(0.06)		(0.07)
Week 46				-0.03		0.09
				(0.06)		(0.07)
Week 47				0.04		0.21*
				(0.12)		(0.13)
After Week 47				-0.71***		-0.64***
				(0.17)		(0.18)
Constant	4.67***	4.84***	4.73***	3.83***	5.51***	2.17***
	(0.02)	(0.03)	(0.03)	(0.51)	(0.63)	(0.58)
Observations	31,677	31,677	31,677	31,620	31,620	31,620
R-squared	0.084	0.123	0.125	0.143	0.089	0.134
OLS	Yes	Yes	Yes	Yes	Yes	Yes

Note: Shows coefficient estimates (OLS) for general risk attitudes. Models (1) to (4) use the average risk attitude in general between round 3 and 4 as the dependent variable. Models (5) and (6) use as risk attitude in general as the dependent variable for round 3 and round 4 separately. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general. Welfare and consumption controls (within economic status) are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Table A2 (extended): Primary Determinants of Risk Attitudes in Traffic

Traffic	M1	M2	M3	M4	M5 (round 3)	M6 (round 4)
Female	-1.31***	-1.35***	-1.23***	-1.20***	-1.15***	-1.26***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Ref: 18-29 years						
30-39 years		-0.16***	-0.15***	-0.07***	-0.01	-0.15***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
40-49 years		-0.41***	-0.38***	-0.28***	-0.22***	-0.35***
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
50-59 years		-0.72***	-0.69***	-0.57***	-0.52***	-0.65***
		(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
60+ years		-1.34***	-1.30***	-1.12***	-1.01***	-1.25***
		(0.03)	(0.03)	(0.04)	(0.05)	(0.04)
Ref: Illiterate, Father						
Literate, Father			0.29***	0.17***	0.11**	0.24***
			(0.04)	(0.04)	(0.05)	(0.04)
Ref: Low/no education						
Primary level				0.10**	0.12**	0.06
				(0.04)	(0.05)	(0.04)
Secondary level				0.00	0.04	-0.04
				(0.05)	(0.06)	(0.05)
University level				0.05	0.09	-0.03
				(0.14)	(0.16)	(0.14)
Log_ Food cons.2014				-0.18***	-0.23***	-0.11**
				(0.05)	(0.06)	(0.05)
Log_ Non-food cons.2014				0.06	0.07	0.04
				(0.04)	(0.05)	(0.05)
Log_Welfare				-0.07	-0.10	-0.06
				(0.06)	(0.07)	(0.07)
Ref: No food shortage						
Food shortage				-0.44***	-0.33***	-0.55***
				(0.04)	(0.04)	(0.04)
Ref: No bank account						
Bank account				0.15***	0.15***	0.15***
				(0.05)	(0.05)	(0.05)
Ref: Single						
Married				-0.30***	-0.32***	-0.27***
				(0.04)	(0.05)	(0.04)
Divorced				-0.27***	-0.40***	-0.11
				(0.09)	(0.11)	(0.10)
Widowed				-0.23***	-0.28***	-0.16**
				(0.06)	(0.07)	(0.06)
# of Household members				0.00	0.00	0.01
				(0.01)	(0.01)	(0.01)

Ref: No Occupation			
Food Farming	0.05	-0.01	0.11*
	(0.05)	(0.07)	(0.06)
Export&Industrial Farming	0.22*	0.14	0.30***
	(0.11)	(0.14)	(0.11)
Breeding	0.06	0.04	0.10
	(0.11)	(0.14)	(0.13)
Industry	-0.22**	-0.30***	-0.14
	(0.09)	(0.12)	(0.09)
Commerce	-0.02	-0.10	0.04
	(0.07)	(0.09)	(0.08)
Manufacturing	-0.02	-0.13	0.10
	(0.13)	(0.15)	(0.15)
Other occupation	0.01	-0.06	0.08
	(0.07)	(0.09)	(0.08)
# of hours worked	0.00**	0.00***	0.00
	(0.00)	(0.00)	(0.00)
Ref: Not subjectively poor			
Subjectively Poor	-0.08**	-0.12***	-0.05
	(0.04)	(0.04)	(0.04)
Ref: Not sick			
Sick	-0.07***	-0.05	-
	(0.03)	(0.03)	-
Ref: No disability			
Disability	-0.25***	-0.28***	-0.21***
	(0.06)	(0.07)	(0.06)
Ref: Week 30			
Before Week 30		0.45	
		(0.32)	
Week 31		0.12	
		(0.12)	
Week 32		0.06	
		(0.13)	
Week 33		0.02	
		(0.07)	
Week 34		-0.03	
		(0.07)	
Week 35		-0.02	
		(0.07)	
Week 36		-0.22***	
		(0.07)	
Week 37		-0.35***	
		(0.09)	
After Week 37		0.49	
		(0.46)	
Ref: Week 42			
Before Week 42	0.51***		0.50**
	(0.16)		(0.21)
Week 43	0.00		-0.01
	(0.06)		(0.06)
Week 44	-0.07		-0.15**
	(0.06)		(0.06)
Week 45	-0.06		-0.08
	(0.05)		(0.06)
Week 46	-0.07		0.03
	(0.06)		(0.07)
Week 47	-0.38***		-0.33***
	(0.10)		(0.10)
After Week 47	-0.46***		-0.33*
	(0.18)		(0.19)

Constant	4.06***	4.44***	4.30***	7.20***	8.10***	6.45***
	(0.02)	(0.03)	(0.03)	(0.49)	(0.59)	(0.56)
Observations	31,677	31,677	31,677	31,620	31,620	31,620
R-squared	0.124	0.182	0.185	0.212	0.139	0.187
OLS	Yes	Yes	Yes	Yes	Yes	Yes

Note: Shows coefficient estimates (OLS) for risk attitudes in traffic. Models (1) to (4) use the average risk attitude in traffic between round 3 and 4 as the dependent variable. Models (5) and (6) use risk attitude in traffic as the dependent variable for round 3 and round 4 separately. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in traffic. Welfare and consumption controls (within economic status) are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

Table A3 (extended): Primary Determinants of Risk Attitudes in Financial matters

Financial	M1	M2	M3	M4	M5 (round 3)	M6 (round 4)
Female	-1.08***	-1.11***	-1.06***	-0.97***	-0.93***	-1.02***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Ref: 18-29 years						
30-39 years		0.30***	0.30***	0.15***	0.17***	0.12***
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
40-49 years		0.19***	0.20***	0.06	0.06	0.05
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
50-59 years		-0.25***	-0.23***	-0.32***	-0.27***	-0.37***
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
60+ years		-1.19***	-1.17***	-0.99***	-0.92***	-1.07***
		(0.04)	(0.04)	(0.05)	(0.06)	(0.05)
Ref: Illiterate, Father						
Literate, Father			0.14***	0.06	0.01	0.11**
			(0.04)	(0.04)	(0.05)	(0.04)
Ref: Low/no education						
Primary level				0.11**	0.12**	0.10**
				(0.04)	(0.05)	(0.05)
Secondary level				-0.15***	-0.12**	-0.18***
				(0.05)	(0.06)	(0.06)
University level				-0.31**	-0.32**	-0.37***
				(0.13)	(0.15)	(0.14)
Log_ Food cons.2014				-0.08	-0.17***	-0.01
				(0.05)	(0.06)	(0.06)
Log_ Non-food cons.2014				0.11**	0.08*	0.12**
				(0.04)	(0.05)	(0.05)
Log_Welfare				0.03	0.03	0.06
				(0.06)	(0.07)	(0.07)
Ref: No food shortage						
Food shortage				-0.06*	0.04	-0.16***
				(0.04)	(0.04)	(0.04)
Ref: No bank account						
Bank account				0.50***	0.48***	0.53***
				(0.05)	(0.06)	(0.05)
Ref: Single						
Married				0.14***	0.18***	0.12**

	(0.04)	(0.05)	(0.05)
Divorced	0.11	-0.01	0.25**
	(0.10)	(0.12)	(0.12)
Widowed	-0.03	-0.02	-0.02
	(0.06)	(0.08)	(0.07)
# of Household members	-0.01*	-0.01	-0.01*
	(0.01)	(0.01)	(0.01)
Ref: No Occupation			
Food Farming	0.33***	0.23***	0.44***
	(0.06)	(0.07)	(0.07)
Export&Industrial Farming	0.34***	0.19	0.51***
	(0.12)	(0.14)	(0.13)
Breeding	0.34**	0.15	0.55***
	(0.13)	(0.17)	(0.14)
Industry	0.48***	0.35***	0.62***
	(0.10)	(0.12)	(0.12)
Commerce	0.64***	0.43***	0.85***
	(0.07)	(0.09)	(0.09)
Manufacturing	0.59***	0.44***	0.74***
	(0.13)	(0.16)	(0.15)
Other occupation	0.24***	0.07	0.42***
	(0.07)	(0.09)	(0.09)
# of Hours worked	0.01***	0.01***	0.00***
	(0.00)	(0.00)	(0.00)
Ref: Not subjectively poor			
Subjectively Poor	-0.20***	-0.26***	-0.14***
	(0.04)	(0.04)	(0.04)
Ref: Not sick			
Sick	0.09***	0.09***	-
	(0.03)	(0.03)	-
Ref: No disability			
Disability	-0.37***	-0.37***	-0.35***
	(0.06)	(0.07)	(0.07)
Ref: Week 30			
Before Week 30		1.47***	
		(0.39)	
Week 31		0.25**	
		(0.12)	
Week 32		0.29**	
		(0.14)	
Week 33		0.13*	
		(0.08)	
Week 34		0.25***	
		(0.07)	
Week 35		0.26***	
		(0.07)	
Week 36		0.12*	
		(0.07)	
Week 37		-0.13	
		(0.10)	
After Week 37		0.17	
		(0.53)	
Ref: Week 42			
Before Week 42	0.33**		0.32**
	(0.13)		(0.16)
Week 43	0.05		-0.02
	(0.06)		(0.07)
Week 44	-0.00		-0.15**
	(0.06)		(0.07)
Week 45	0.08		-0.03

				(0.06)		(0.06)
Week 46				0.17***		0.19***
				(0.06)		(0.07)
Week 47				0.01		0.10
				(0.12)		(0.13)
After Week 47				-0.88***		-0.97***
				(0.16)		(0.19)
Constant	5.30***	5.40***	5.33***	4.09***	5.35***	2.83***
	(0.02)	(0.03)	(0.03)	(0.51)	(0.63)	(0.58)
Observations	31,677	31,677	31,677	31,620	31,620	31,620
R-squared	0.076	0.130	0.131	0.168	0.110	0.143
OLS	Yes	Yes	Yes	Yes	Yes	Yes

Note: Shows coefficient estimates (OLS) for risk attitudes in financial matters. Models (1) to (4) use the average risk attitude in financial matters between round 3 and 4 as the dependent variable. Models (5) and (6) use risk attitude in financial matters as the dependent variable for round 3 and round 4 separately. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in financial matters. Welfare and consumption controls (within economic status) are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level

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