

#### **Appendix 4. Risk game.**

This appendix contains the design, instructions and more detailed results (see Table A4.2) of a risk game that we employed in order to explore the risk preferences of our experimental subjects. We provide specifications of how the four treatments we used differ (see also Table A4.1) and how these different treatments affect choices.

In the risk game, subjects got to choose individually between three paired lotteries (A and B), where B was more risky than A, i.e. had a wider payoff spread. The expected utility (payoff) of A and B was varied across the three choices by changing the probability levels. This game is based on the one by Holt and Laury (2002). We have shortened (three instead of originally ten choices) and modified it (framed it in terms of losing and investing resource stock units) to fit it to our experiment. Due to this simplification, please note that this task provides us only with information on whether or not our subjects are extremely risk-averse or extremely risk-seeking (because the intermediate probabilities are not observed).

In total, we collected 253 observations of which we could only use 214 due to the fact that some answers were inconsistent or difficult to interpret. We alternated between four treatments: 1) 'no loss, low stakes' (74 observations), 2) 'no loss, high stakes' (45 observations), 3) 'investment, low stakes' (42 observations) and 4) 'investment, high stakes' (53 observations). By comparing results from the first two treatments, we can deduce if stakes influence the level of risk aversion. In the latter two treatments, we asked our participants to give up some of their earnings from what they had earned during the experiment. We added these two latter treatments to see whether or not subjects were more averse to risk when losses were involved compared to when only potential gains were involved. We employed these four different treatments in order to explore whether or not low vs. high stakes and no investment vs. investment influence behavior, as predicted by prospect theory (Kahneman and Tversky 1979). It is important to note that the subjects always had the option of opting out of the risk game. The most important question was to assess the risk preferences of our subjects.

The instructions we provide below are the ones for the 'no loss, low stakes' treatment. The instructions of the other no loss treatment coincides with this one except for the amount of money one can win (see Table A4.1 for more detailed information). For the two investment treatments, the potential earnings coincide with the no loss treatments but additionally subjects need to invest money in order to take part in the game.

Instructions for the 'no loss, low stakes' risk game treatment:

**Participant no.** \_\_\_\_\_

**You now have the chance to earn some extra resource units.** The exact amount of these extra units depends on the choices you will make. Please note that you cannot lose any of your already earned resource units by participating in this exercise.

For the three questions below, we ask you to decide between two options. For each question please indicate whether you prefer option A *or* B.

After you made your choices, one of the decisions will be picked through a random draw. The amount of extra earned resource units, which will be converted to SEK, depends therefore on the option you chose for each decision and chance.

1. Option A gives you SEK 15 (3 extra resource units) with a 10 percent chance or SEK 10 (2 extra resource units) with a 90 percent chance.

Option B gives you SEK 20 (4 extra resource units) with a 10 percent chance or SEK 5 (1 extra resource unit) with a 90 percent chance.

I choose option: \_\_\_\_\_

2. Option A gives you SEK 15 (3 extra resource units) with a 50 percent chance or SEK 10 (2 extra resource units) with a 50 percent chance.

Option B gives you SEK 20 (4 extra resource units) with a 50 percent chance or SEK 5 (1 extra resource unit) with a 50 percent chance.

I choose option: \_\_\_\_\_

3. Option A gives you SEK 15 (3 extra resource units) with a 90 percent chance or SEK 10 (2 extra resource units) with a 10 percent chance.

Option B gives you SEK 20 (4 extra resource units) with a 90 percent chance or SEK 5 (1 extra resource unit) with a 10 percent chance.

I choose option: \_\_\_\_\_

Table A4.1, on the next page, compares the four risk game treatments in terms of expected values and payoff differences. By means of this information, we can determine the risk preferences of our subjects. An extremely risk-averse subject, for example, makes the following choices: option A for all three decisions (independent of treatment) because the lottery is safer.

**Table A4.1.** Comparison of the four risk game treatments in terms of expected values and payoff differences. Prob means probability.

Treatment 1: no loss, low takes

Option		A				B ("risky" option)					Expected payoff difference
Decision	Prob	SEK	Prob	SEK	Expected value	Prob	SEK	Prob	SEK	Expected value	
1	0.1	15	0.9	10	10.5	0.1	20	0.9	5	6.5	4
2	0.5	15	0.5	10	12.5	0.5	20	0.5	5	12.5	0
3	0.9	15	0.1	10	14.5	0.9	20	0.1	5	18.5	-4

Treatment 2: no loss, high stakes

Option		A				B ("risky" option)					Expected payoff difference
Decision	Prob	SEK	Prob	SEK	Expected value	Prob	SEK	Prob	SEK	Expected value	
1	0.1	60	0.9	40	42	0.1	80	0.9	20	26	16
2	0.5	60	0.5	40	50	0.5	80	0.5	20	50	0
3	0.9	60	0.1	40	58	0.9	80	0.1	20	74	-16

Treatment 3: investment (SEK 10), low stakes

Option		A				B ("risky" option)					Expected payoff difference
Decision	Prob	SEK	Prob	SEK	Expected value	Prob	SEK	Prob	SEK	Expected value	
1	0.1	15	0.9	10	10.5	0.1	20	0.9	5	6.5	4
2	0.5	15	0.5	10	12.5	0.5	20	0.5	5	12.5	0
3	0.9	15	0.1	10	14.5	0.9	20	0.1	5	18.5	-4

Treatment 4: investment (SEK 40), high stakes

Option		A				B ("risky" option)					Expected payoff difference
Decision	Prob	SEK	Prob	SEK	Expected value	Prob	SEK	Prob	SEK	Expected value	
1	0.1	60	0.9	40	42	0.1	80	0.9	20	26	16
2	0.5	60	0.5	40	50	0.5	80	0.5	20	50	0
3	0.9	60	0.1	40	58	0.9	80	0.1	20	74	-16

**Table A4.2.** Results of the risk game.

	Treatment 1		Treatment 2		Treatment 3		Treatment 4	
	N	%	N	%	N	%	N	%
Extremely risk-averse	12	16	12	27	10	24	9	17
Neither of both	57	77	32	71	31	74	40	75
Extremely risk-seeking	5	7	1	2	1	2	4	8

N = number subjects.

### **Literature cited**

- Holt, C. A., and S. K. Laury. 2002. Risk Aversion and Incentive Effects. *The American Economic Review* 92(5):1644-1655.
- Kahneman, D., and A. Tversky. 1979. Prospect theory: An analysis of decision under risk. *Econometrica* 47:263-291.