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Risk-taking on Behalf of Others

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Abstract

We present an experimental study on how people take risk on behalf of others. We use three different elicitation methods, and study how each subject makes decisions both on behalf of own money and on behalf of another individual's money. We find a weak tendency of lower risk-taking with others' money compared to own money. However, subjects believe that other participants take more risk with other people's money than with their own. At the same time, subjects on average think that others are more risk averse than themselves. The data also reveals that subjects are quite inconsistent when making risk decisions on behalf of others, indicating random behavior. A large majority of subjects alternates between taking more risk, less risk or the same amount of risk with other people's money compared to own money.

Keywords: risk-taking, other people's money, beliefs, preferences, experiment.

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1. Introduction

In the aftermath of the 2007-2008 financial crisis, Paul Krugman claimed that "Overpaid bankers taking big risks with other people's money brought the world economy to its knees." It is now generally accepted that the financial crisis was caused by excessive risk-taking and misaligned incentives. However, it is less clear whether people, ceteris paribus, actually take more risk with other people's money than with their own money, i.e. if people are less risk averse on behalf of others when there are no monetary incentives to guide behavior. Hence, this is our research question: How do people take risk with other people's money? Furthermore, is there any systematic heterogeneity with respect to how people manage others' compared with own money?

Evidence so far is mixed. Chakravarty et al. (2011), Polman (2012), Agranov et al. (2014) and Pollmann et al. (2014) find in different experimental contexts that subjects tend to take more risk on behalf of others than on behalf of themselves. On the other hand, Charness and Jackson (2009), Reynolds et al. (2009), Bolton and Ockenfels (2010), Eriksen and Kvaløy (2010), and Pahlke et al. (2015) find increased risk aversion when the decisions involve other people's money (we will discuss these results in more detail in Section 2).

The main ambition with the present paper is to collect a broader set of evidence. We use three different well-established and very simple elicitation methods. First we employ the Eckel and Grossman's (2002) gamble to elicit actual risk-taking behavior on behalf of own and others' money. Then we compare this with two well-known hypothetical elicitation methods, the labor market choice by Barsky et al. (1997) and the investment choice used in the SOEP survey (see

Dohmen et al., 2005) [1]. We also elicit beliefs about others' risk preferences, and about how people think about how others take risk on behalf of others.

The main results are as follows: First, there is a slight tendency that subjects take less risk with others' money compared with own money. From the Eckel and Grossman gamble, we find that the averages are not significantly different, but there are significantly fewer subjects taking high risk with others' money compared with own money. From the labor market choice, risk-taking is significantly lower when the choice involves another person. Subjects choose riskier job offers when it concerns them, than when the consequences are borne by someone else. For the hypothetical lottery choice, however, there are no signicant differences between managing own and others' money.

The main tendency of lower risk-taking on behalf of others is also found when we simply ask the subjects: Are you more or less willing to take risk with own money compared with others' money? Of the subjects, 59% answered that they are more willing to take risk with own money, which is significantly different from 50%. We also find that subjects on average think that others are more risk averse than themselves. Moreover, when we look at the beliefs about how other subjects take risk on behalf of others, we find that subjects believe that other participants take less risk with their own money than with other people's money. Hence, the beliefs are not consistent with actual behavior.

The data also shows that subjects are quite inconsistent when making risk decisions on behalf of others, indicating random behavior. A large majority of subjects alternates between taking more risk, less risk or the same amount of risk with other people's money (compared to own money) over the three decsion tasks. Approximately one third of the subjects increases risk-

[1] The SOEP is a widely used and well-recognized panel survey that provides personal and household information including political and several social statistics from the German population. The survey was created in 1984 by the German Institute for Economic Research (DIW Berlin).

taking when it is on behalf of another subject, while one third reduces risk-taking, but only 3% of the subjects take consistently more or less risk with other people's money over all the three tasks.

The rest of the paper is organized as follows. In Section 2 we present a brief literature review and in Section 3 we introduce the experimental design and procedure. In Section 4 the results are shown, while Section 5 concludes. The instructions of the experiment and complementary tables are relegated to the Appendix.

2. Related literature

Recently, a small literature has emerged investigating how people take risk with other people's money. As in the experimental literature on risk-taking with own money, the elicitation methods and experimental contexts vary. Some employ neutral phrasing while others use more context, such as "investment managers" and "clients". The experiments also vary with respect to whom the decision makers make decisions for. While some investigate how people take risk on behalf of groups (which they are a part of), others investigate how people take risk on behalf of another individual. There are also some differences with respect to what kind of risk aversion is measured. Some researchers measure loss aversion while others measure standard risk aversion.

The results from the different experiments are mixed. Chakravarty et al. (2011) use the well-established multiple price list (MPL) procedure (see Holt and Laury, 2002, 2005 and Harrison et al., 2005) and find that decision makers take more risk with others' money than with own money. Eriksen and Kvaløy (2010), Pollmann et al. (2014), and Montinari and Rancan (2013) use the Gneezy and Potters (1997) investment task. The former find more risk aversion on behalf of others while the latter two find less. A different stream in the literature studies the effect of accountability. Bolton et al. (2015) find that social responsibility promotes a conservative risk behavior. Sutter (2009) finds the opposite while Humphrey and Renner (2011)

find no difference. Pollmann et al. also study this effect. They find that accountability in terms of monetary rewards reduces risk-taking on behalf of others. In contrast, Agranov et al. (2014) and Andersson et al. (2013) find that incentives increase risk-taking on behalf of others, but in these studies incentives are tournament-based, which is known to trigger risk-taking. Also related is Kvaløy and Luzuriaga (2014), who study trust decisions on behalf of others. They find no significant differences in trust level between subjects who invest own money and subjects who invest on behalf of others.

A few studies investigate loss aversion on behalf of others. Vieder et al. (2015), Pahlke et al. (2012), Andersson et al. (2014) and Polman (2012) find reduced loss aversion on behalf of others, while Eriksen and Kvaløy (2010) find that people's degree of *myopic* loss aversion is lower when deciding for others.

Finally, there are several experiments studying how people make decisions on behalf of a group (which the decision maker him/herself is part of). Fullbrunn and Luhan (2015), Reynolds et al. (2009), Pahlke et al. (2015), Charness and Jackson (2009), and Bolton and Ockenfels (2010) use different elicitation methods (see Table 1), but all find lower risk-taking when the outcome affects a group and not only themselves.

As we see it is hard to find any clear tendency, except that loss aversion seems lower on behalf of others than on behalf of own money, while risk aversion on behalf of groups seems higher. Our paper focuses on standard risk-taking on behalf of a single anonymous individual and is thus closest to Chakravarty et al. (2011) and Pollmann et al. (2014). In contrast to most of the studies in Table 1, we use both a within and between design which enable us to study how individuals change their decision when they take risk for others compared with for themselves. Moreover, we use three different elicitation methods, while the other studies use only one. Finally, we elicit beliefs about others' preferences.

Table 1. Experimental studies on risk-taking on behalf of others.

Authors	Title	Risk-taking for others vs. own	Elicitation method	Design	Remark
Reynolds et al., 2009	Risky Shift Versus Cautious Shift: Determining Differences In Risk Taking Between Private And Public Management Decision-Making	less risk-taking on behalf of others	binary choice problem	within	decision-making on behalf of a group
Charness and Jackson, 2009	The role of responsibility in strategic risk-taking	less risk-taking on behalf of others	stag hunt game	within	decision-making on behalf of a group
Sutter, 2009	Individual behavior and group membership: Comment	more risk-taking on behalf of others	risky investment task similar to Gneezy and Potters (1997)	between	accountability and recency effect
Bolton and Ockenfels, 2010	Betrayal Aversion: Evidence from Brazil, China, Oman, Switzerland, Turkey, and the United States: Comment	less risk-taking on behalf of others	binary choice problem	between	decision-making on behalf of a group
Eriksen and Kvaløy, 2010	Myopic Investment Management	less risk-taking on behalf of others	Gneezy and Potters (1997) investment task	between	myopic loss-aversion
Chakravarty et al., 2011	Are You Risk Averse over Other Peoples' Money	more risk-taking on behalf of others	Multiple Price List by Holt and Laury (2002, 2005) and Harrison et al., 2005	within	
Humphrey and Renner, 2011	The social costs of responsibility	no difference	MPL (Holt and Laury, 2002)	between	accountability
Pahlke et al., 2012	Risk-taking for others under accountability.	less loss/risk-aversion on behalf of others	choice between sure amount and binary 50-50 prospect	between	accountability and loss aversion
Polman, 2012	Self–other decision making and loss aversion (see study 3)	more risk-taking on behalf of others	binary choice problem	between	loss-aversion
Andersson et al., 2013	Risking Other People's Money Experimental Evidence on Bonus Schemes, Competition, and Altruism	more risk-taking on behaolf of others when incentivezed	binary choice problem (similar to Binswanger, 1980 or Tanaka et al., 2010)	between	incentivized decision makers
Harrison et al., 2013	Preferences Over Social Risk	no difference	MPL (Holt and Laury, 2002)	within	decision-making on behalf of a group
Montinari and Rancan, 2013	Social Preferences under Risk: the Role of Social Distance	less risk-taking on behalf of others	investment task similar to Gneezy and Potters (1997) and Charness and Gneezy (2010)	within	lotteries with negative expected value
Agranov et al., 2014	An experimental study of the impact of competition for Other People's Money: the portfolio manager market	more risk-taking on behalf of others	risky and safe project to invest	between and within	incentivized decision makers
Pollmann et al., 2014	Risk taking by agents: The role of ex-ante and ex-post accountability	more risk-taking on behalf of others	Gneezy and Potters (1997) investment task	between	incentivized decision makers
Kvaløy and Luzuriaga, 2014	Playing the Trust Game with Other People's Money	no difference	Investment Game (Berg et al., 1995)	between	trust decisions on behalf of others
Andersson et al., 2014	Deciding for Others Reduces Loss Aversion	less loss-aversion on behalf of others	variation of MPL task by Holt and Laury (2005)	between	loss-aversion
Bolton et al., 2015	Social responsibility promotes conservative risk behavior	less risk-taking on behalf of others	variation of MPL task by Holt and Laury, 2002	within	accountability, group risk-taking
Pahlke et al., 2015	Responsibility Effects in Decision Making under Risk	less risk-taking on behalf of others	binary choice problem	between	decision-making on behalf of a group
Vieider et al., 2015	Risk taking for oneself and others: A structural model approach	less loss/risk-aversion on behalf of others	certainty equivalents choice list	between	accountability and loss aversion
Fullbrunn and Luhan, 2015	Am I my peer's keeper? Social Responsability in Financial Decision Making	less risk-taking on behalf of others	risky investment task similar to Gneezy and Potters (1997)	within	decision-making on behalf of a group

3. Experimental Design and Procedure

In order to answer our research questions we use three well-established measures of risk attitudes. The experiment starts with Eckel and Grossmann's (2002) elicitation procedure (see details below), where participants are asked to play a gamble on behalf of another participant ("Other people's money" - OPM) and also on behalf of themselves (OWN). A follow-up question was stated to elicit the general beliefs about the other participants' own risk preferences (*Belief OWN*), and the beliefs about the preferences of the other participants when deciding on behalf of others (*Belief OPM*). In the second part of the experiment, we elicit the preferences by using two measures that do not involve real money. Participants respond to a hypothetical income gamble and to a hypothetical investment opportunity. The order of the decisions on behalf of others and on behalf of themselves was alternated to control for potential order effects. Subjects were not informed about the different stages in the beginning of the experiment. Instead, they got instructions just before each decision task. All outcomes were given at the end of the whole experiment.

A total of 190 students from the University of Stavanger in Norway participated in the experiment. The students were recruited by email and assigned within each of the 12 sessions. They were told that by participating in an economic experiment they would have the possibility to earn a good sum of money. The stakes in this experiment are relatively higher than the average payment that a student would earn in a work hour. The experiment was conducted and programmed with the software z-Tree (Fischbacher, 2007). All instructions were given in Norwegian and through the pc-screen.

3.1 The elicitation methods

The first elicitation method is the lottery task shown in Table 2, and involves choosing a lottery gamble from a set of six gambles (replicating the framework by Eckel and Grossman, 2002 and 2008; and Dave et al., 2010). One of them (gamble 1) represents a safe option with sure payoff (NOK 100, about 14 EURO). From gambles 2 to 5, both the risk (standard deviation) and expected value increase. Gamble 6 only increases in risk with respect to gamble 5, but not in expected value. Subjects did not get to see the calculated expected payoff or the standard deviations. We choose this procedure due to its simplicity and clarity. Subjects can easily understand the task, make the calculations of the expected payoffs, and identify the difference between the options (risk). This minimizes possible errors while making decisions. Subjects did not get to see the two rightmost columns showing the expected payoffs and standard deviations of the gambles.

Table 2: Lottery task

Gamble	Event	Payoff (NOK)	Probability	Expected payoff	Risk Std.dev
Gamble 1	High	100	50 %	100	0
	Low	100	50 %		
Gamble 2	High	86	50 %	107.5	30
	Low	129	50 %		
Gamble 3	High	71	50 %	114	61
	Low	157	50 %		
Gamble 4	High	57	50 %	121.5	91
	Low	186	50 %		
Gamble 5	High	43	50 %	128.5	121
	Low	214	50 %		
Gamble 6	High	7	50 %	128.5	172
	Low	250	50 %		

Note: The level of risk is given by the standard deviation of the payoffs.

The next method consists of the hypothetical job market question by Barsky et al. (1997), used hereafter by BJKS and reformulated by Aarbu and Schroyen (2014):

"Imagine a situation where reasons beyond your control force you to change occupation. You can choose between two new jobs. Job 1 guarantees you the same income as your current income. Job 2 gives you a 50% chance of an income twice as high as your current income, but with a 50% chance it results in a reduction of your current income by one third. What is your immediate reaction? Would you choose Job 1 or Job 2?"

To elicit risk preferences when decisions are made for others, we reframed the question as follows:

"Imagine a person in a situation where reasons beyond his/her control force him/her to change occupation. He/She can choose between two new jobs. Job 1 guarantees the same income as his/her current income. Job 2 gives a 50% chance of an income twice as high as his/her current income, but with a 50% chance it results in a reduction of his/her current income by one third. What is your immediate reaction if you would have to give advice? Would you advise him/her to choose Job 1 or Job 2?"

After answering this question participants are presented with two new alternatives depending on their choice. If Job 1 was chosen, subjects then have to decide whether to keep Job 1 or a new version of Job 2 which gives 50% chance to double the income, but a 50% chance of reduction by 1/5, instead of 1/3. If Job 2 was selected, the alternatives are to keep Job 2 or to choose a new version of Job 2 where the possible income reduction increases from 1/3 to 1/2. Thus, this procedure allows us to classify individuals' risk preferences into 4 categories.

The third procedure consists of a hypothetical investment choice. This has been utilized in a representative survey from Germany (SOEP) and is used by, among others, Dohmen et al., (2005), Leuermann and Roth (2012) and Aarbu and Schroyen (2014):

"Imagine you won 1 million kroner[2] in a lottery. Almost immediately after you collect the money, you receive the following financial offer from a bank, the conditions of which are as follows: There is the chance to double the money within two years. However, it is equally possible that you could lose half of the amount invested. What fraction of the 1 million kroner would you invest: 0, 200 000, 400 000, 600 000, 800 000, or 1 million?"

When the decision is on behalf of others we reframed the statement as follows:

"Imagine a person who has won 1 million kroner in a lottery. Almost immediately after this person collects the money, he/she receives the following financial offer from a bank, the conditions of which are as follows: There is the chance to double the money within two years. However, it is equally possible that he/she could lose half of the amount invested. Suppose that you are going to make the decision on behalf of this person. What fraction of the 1 million kroner would you invest on behalf of this person: 0, 200 000, 400 000, 600 000, 800 000, or 1 million?"

3. Results

In this section, we summarize the main findings from our three risk-taking elicitation methods: the Eckel and Grossman lottery choice is denoted Lottery. The hypothetical job market and investment choices are denoted Job and Hypothetical Lottery, respectively. Both the lottery choices and the Hypothetical Lottery take the values 1, 2, 3, 4, 5 or 6 (for gambles 1 to 6 or investment level 1 to 6, respectively), and higher values correspond to higher risk. Likewise, the variable Job runs from one to four and increases in risk. Decisions and choices regarding the subjects' own risk-taking is denoted OWN, while decisions and choices regarding made on behalf of others is denoted OPM.

[2] We have used kroner to adapt the investment situation to the Norwegian context.

Table 3. Risk-taking with own and with other people's money.

Table 2 summarizes the average risk-taking from decisions taken for themselves (OWN) and on behalf of others (OPM) for each elicitation method. It also provides the Wilcoxon matched-pairs z-values and corresponding two-tailed p-values for differences between OWN and OPM. The sample size is 190 observations.

	OWN			OPM			Wilcoxon matched-pairs	
	Mean	Std	Median	Mean	Std	Median	z- value	p-value
Lottery	3.98	1.70	5	3.88	1.79	4	-0.20	0.84
Job	2.37	0.95	2	2.16	0.89	2	3.38	< 0.01
Hypothetical lottery	2.34	1.25	2	2.39	1.25	2	-0.89	0.37

Table 3 presents descriptive statistics and non-parametric tests for the three tasks under both OWN and OPM. First, the table reveals that the average decision in the lottery task is close to the same in OWN and OPM. The risk-taking is slightly higher in OWN compared with OPM, and the median choice is also higher in OWN, however the Wilcoxon matched-pairs test shows that the difference is not statistically significant.[3] In the hypothetical lottery task the average choice is marginally higher in OPM compared with OWN, and again the difference is not significant. In the job decision task, however, we observe a significant difference between OWN and OPM. On average, subjects report themselves as being more willing to risk their own current salary compared to the risk they would advise others to take. We thus present our first result:

Result 1: *Decisions in the Lottery task with own money and choices in the Hypothetical Lottery with own money are not significantly different from the corresponding decisions and choices regarding other people's money. However, in the hypothetical job task, subjects advise others to take significantly less risk with their salary than what they would do with their own salary.*

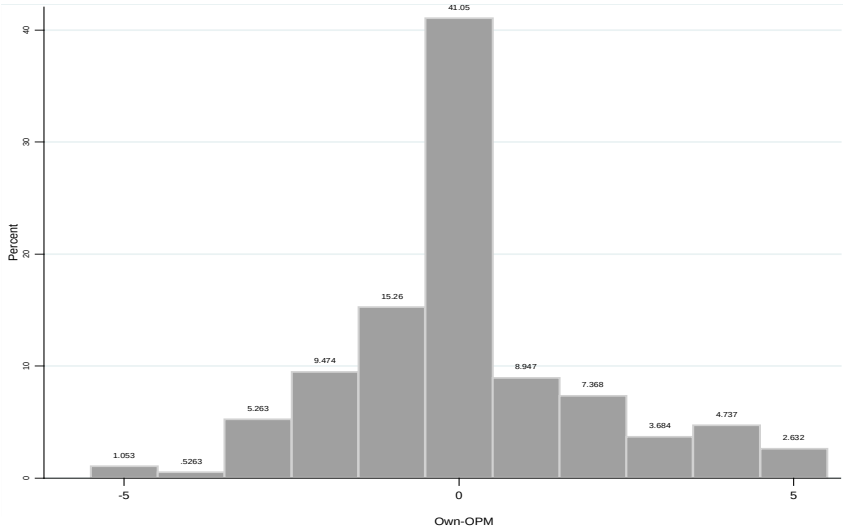
[3] We used the Wilcoxon matched-pairs because the observations are dependent, i.e. the same subject makes two decisions: a decision on behalf of others, and one for self.

Even though we do not observe a significant difference when we compare averages for the lottery task, the distribution shows that more people choose high risk lotteries (lotteries 5 and 6) in OWN, than in OPM (see Figure A1 in the Appendix). However, the difference is only significant at the 10% level (Mann-Whitney U-Test, z= 1.66, p=0.10). A corresponding high-risk difference is also found when we look at the responses to the job question. Significantly more subjects report choosing the riskier job offer when it concerns themselves, than when the possible consequences are borne by someone else (Mann-Whitney U-Test, z= 2.29, p=0.02). We do not find a similar high-risk difference in the hypothetical lottery task.

We have shown that the average risk-taking in OWN and OPM in the lottery task is almost the same. However, we find that a large portion of subjects make different choices in OWN compared to OPM. That is, a large portion of subjects take higher risk with their own money, and lower risk with other people's money, or vice versa. In Figure 1 we present the distribution of the difference in lottery choices between OWN and OPM. The distribution shows the difference between the lottery decision in OPM and the lottery decision in OWN for each individual. We see that 41% of the subjects make the same decision in OWN and OPM. We also see that 27.4% of the subjects make a less risky decision for themselves, whereas 31.6% of the subjects choose to take more risk with other people's money. The same pattern is found when we look at the two other tasks, presented in Table A1 and Figure A1 in the appendix.[4] Both in the Job task and in the hypothetical lottery task 63% of the subjects made the same decision in OWN and in OPM. Furthermore, 11% (26%) and 20% (17%) of the subjects increase (decrease) risk-taking with OPM, in the Job task and the hypothetical lottery task, respectively.

[4] The lottery choices take the values 1, 2, 3, 4, 5 or 6 (for gambles 1 to 6). We then calculate the difference in responses between OWN and OPM (OWN-OPM), and get values running from -5 to 5. A value of zero indicates same risk-taking with OWN and OPM, negative values indicate higher risk-taking with OPM than OWN, while positive values indicate lower risk-taking with OPM than OWN.

Figure 1: The difference in lottery choices between OWN and OPM



Now, a question is whether subjects are consistent in their risk-taking. In other words, are subjects consistent over tasks in how risk-taking on behalf of others compares to risk-taking under OWN? We start by looking at correlation coefficients for decisions made in OWN and OPM for the different tasks. Table 4 shows that there is a significant correlation between the lottery, the job task and the hypothetical lottery both in OWN and in OPM, though not strong. This means that subjects who make low (high) risk choices in the lottery under OWN or OPM tend to make low (high) risk choices also in the job task and in the hypothetical lottery under OWN and OPM. However, and somewhat surprisingly, when we look at whether subjects are consistent between tasks in their risk-taking for themselves and others, we find no significant correlations. The correlation coefficients presented in the right column in Table 4 suggest that subjects who take less (more) risk with other people's money compared with own money in the lottery task are no more likely to do the same in the Job task or in the hypothetical lottery task. Thus, whether a subject who takes less (more) risk with other people's money in the lottery task will do the same in the two other tasks may be random.

Table 4: Correlation coefficients.

	OWN	OPM	Difference‡
Lottery - Job	0.162*	0.061	-0.051
Lottery - Hypo. lottery	0.232*	0.174*	0.068
Hypo. Lottery - Job	0.215*	0.270*	0.002

Note: ǂ : Present the correlation for the difference in decisions (decision in OWN minus decision in OPM) between tasks. *:p<0.05.

To investigate this further, we divide subjects into three types of subjects: those who take more risk in OPM, those who take less risk in OPM, and those who make the same choice in OWN and OPM within the three different tasks. Focusing first on own lottery decisions, we find that subjects who take less risk in OPM make significantly riskier decisions measured in terms of own lottery decisions, than those who take more risk in OPM (average choice of 4.846 versus 2.900; Mann-Whitney U-Test, z= 6.64, p<0.001). Table 5 presents the average risk-taking from lottery decisions with own and other people's money, as well as the differences between the own lottery decision and the decision made for someone else ordered by type of risk-taker (see Table A2 in the Appendix for the job and hypothetical lottery tasks). Thus, at first glance, it seems that subjects who decrease risk with other people's money are less risk averse in terms of their own lottery decisions, compared to subjects who increase risk with other people's money.[5] We observe the same in the job task and in the hypothetical lottery.[6] However, these observations would also follow from random decisions. If the decision made by subjects is simply random, subjects who make high risk decisions in OWN will tend to be more risk averse in OPM, and subjects who make low risk decisions in OWN will tend to be less risk averse in OPM.

[5] The construction of the "types of risk-takers" is biased in the direction of less/more risk aversion with OPM, since, for instance, subjects who choose the riskiest alternative with own money can only take the same risk or less risk with other people's money. Alternatively, subjects who take no risk with their own money can only take the same risk or more risk with other people's money. However, the same result is found when we exclude corner decisions.

[6] Results of the Mann-Whitney U-Test for the job task: z= 5.40, p<0.001; and for the hypothetical lottery: z= 4.76, p<0.001.

Finally, we simply count the subjects who are consistent over tasks with respect to less or more risk with other people's money. We find that 20% of all subjects make the same choice under OWN and OPM, while only 3% choose to either take more risk with OPM in all tasks, or less risk with OPM in all tasks. Thus, 77% of all subjects alternate between taking more risk, less risk or the same amount of risk with other people's money over the three tasks. This is strong evidence against a general subject type that consistently takes less or more risk with other people's money.

Table 5: Risk-taking with own and other people's money by type.

	Lottery OWN	Lottery OPM	|Lottery OWN - Lottery OPM |	# obs.
Less risk in OPM	4.85 (1.09)	2.40 (1.35)	2.44 (1.36)	52
Same risk	4.23 (1.82)	4.23 (1.82)	-	78
More risk in OPM	2.90 (1.41)	4.72 (1.25)	1.82 (1.00)	60

Note: Table 5 presents the average risk-taking from decisions for themselves (OWN) and on behalf of oth (OPM) ordered by type of risk-taker. The table also presents the absolute value for the individual differenc between the two decisions. The sample size is 190 observations.

Result 2: *In all tasks, a large portion of subjects make either riskier choices or less risky choices in OWN compared to what they do in OPM. However, we do not find evidence supporting a general subject type that consistently takes less or more risk with other people's money over the three tasks.*

Now, consider what subjects believe others to do. Following the lottery decision in the experiment, subjects were asked to state their beliefs about other participants' own risk preferences (*Belief OWN*), as well as their beliefs about the preferences of the other participants

when deciding on behalf of others (*Belief OPM*) [7]. In Table 6 we present the average risk-taking from decisions for the lottery task in OWN and OPM, as well as the reported beliefs. We see that subjects believe that other participants take less risk with their own money (3.04) than with other people's money (3.68). Therefore, subjects expect that the participants in the experiment take more risk with other people's money than with their own money. The difference in beliefs is significant ($p<0.01$).

This result is at odds with observed behavior. At best there is no difference in lottery decisions between OWN and OPM, but as pointed out above, subjects choose significantly more often high-risk lotteries in OWN compared with what they do in OPM. In addition, when we simply ask subjects about their preferences, 59% claim to be less willing to take risks with others' money than with own money. This is significantly different from 50% ($p=0.013$).

From Table 6 we also see that subjects believe that others take less risk than themselves (3.04 vs. 3.98). This result is consistent with the *risk-as-value* hypothesis proposed by Brown (1965), which states that people perceive themselves as being more risk-seeking than others. The table also shows that this behavior persists in OPM (3.68 vs. 3.88, respectively).

Result 3: *Subjects believe that people take more risk on behalf of others than on behalf of themselves. In addition, subjects perceived themselves as being more risk-seeking than others when managing both own and other people's money.*

Table 6. Lottery decisions and beliefs.

The table summarizes the average risk-taking and beliefs about risk-taking from lottery in OWN and in OPM. Also, it provides the Wilcoxon matched-pairs z-values and corresponding two-tailed p-values for differences between OWN and OPM; and for differences between Beliefs and Lottery by OWN and OPM. The sample size is 190 observations each.

[7] We asked subjects to state which lottery they believe others would choose when deciding for themselves (*Belief OWN*), as well as the lottery decision they believe others would choose when deciding for others (*Belief OPM*).

	OWN		OPM		Wilcoxon matched-pairs		Belief vs. Lottery			
							OWN		OPM	
	Mean	Std	Mean	Std	z-value	p-value	z-value	p-value	z-value	p-value
Lottery	3.98	1.70	3.88	1.79	0.20	0.85	6.09	< 0.01	1.69	0.09
Belief	3.04	1.84	3.68	1.95	3.57	< 0.01				

Numerous research papers have shown that gender affects risk preferences (see Daruvala, 2007 for an overview). In Table 7 we present the average risk-taking with OWN and OPM for the three elicitation methods ordered by gender.

Table 7. Risk-taking with OWN and OPM by gender.

The table presents the average risk-taking from lottery decisions in OWN and OPM by gender for the three elicitation methods. In addition, it provides the Wilcoxon matched-pairs z-values and two-tailed p-values for differences between OWN and OPM by gender, as well as the Mann-Whitney test for differences between genders by OWN and OPM. The number of observations is 87 for men and 103 for women.

	Men						Female						Man-Whitney U-test: Men vs. Women			
	OWN		OPM		Wilcoxon test		OWN		OPM		Wilcoxon test		OWN		OPM	
	Mean	Std	Mean	Std	z- value	p-value	Mean	Std	Mean	Std	z- value	p-value	z- value	p-value	z- value	p-value
Lottery	4.51	1.52	4.38	1.69	-0.06	0.96	3.53	1.73	3.47	1.77	-0.24	0.81	-4.00	<0.01	-3.65	<0.01
Job	2.57	0.94	2.30	0.95	2.92	<0.01	2.20	0.93	2.04	0.83	1.95	0.05	-2.72	0.01	1.76	0.08
Hypothetical lottery	2.44	1.3	2.44	1.34	0.45	0.65	2.25	1.2	2.36	1.18	-1.55	0.12	-0.94	0.35	-0.14	0.89

Consider first the risk-taking by men and women within treatments (Men vs. Women). Consistent with the literature, we see that women take significantly less risk compared to men in the lottery task both in OWN and OPM. The same is true for the job task, while for the hypothetical lottery task there is no difference between males and females.

Result 4: *Overall, women were more risk averse than men, both with own and with other people's money.*

When we divide the sample by gender and look at differences between OWN and OPM, we generally observe the same pattern as presented in Table 3. For the job measure, men and women take significantly less risk when deciding for others (2.30 and 2.04) than when deciding

for themselves (2.57 and 2.20, respectively), while for the two lottery measures there are no differences between OWN and OPM.

In Table 7 we present regressions supporting some of our findings presented above. From model (1) we see that the coefficient for *OPM* is negative in lottery choices, indicating the tendency of lower risk-taking with other's money compared with own money. However, the coefficient is not significantly different from zero. From the job decision task, shown in model (4), we observe that subjects are significantly less willing to risk someone else's salary compared with their own salary. For the hypothetical lottery choices presented in model (5) there is no difference and subjects are as risk-seeking when they decide for themselves as when they decide for others. In model (2) we estimate a Probit model on the high-risk choices (gambles 5 and 6). Here the coefficient for *OPM* is significant at $p<0.10$, showing that subjects are more willing to choose the high-risk gambles for themselves than for others.

Regarding the beliefs about how others take risk in the lottery task, we see from model (3) that the coefficient for *OPM* is positive and significant, indicating that subjects think that other participants take less risk with their own money than with other people's money.

Finally, the negative coefficients for *Female* support the observed gender differences in risk preferences. Women are significantly more risk averse than men, both in the Eckel and Grossman's gambles and in the job choices. We also see that the gender differences do not change depending on whether decisions are made in OWN or OPM. From the hypothetical lottery choices, the gender coefficient remains negative; however, it is not statistically significant[8].

Table 7. Regressions on risk-taking.

[8] We also estimated the models including the term *OPM*Female* which indicates that there is no interaction effect.

The table presents Random-effects Tobit models for the risk-taking measures (1), (4), (5), and for beliefs (3). A Probit model with marginal effects (2) is estimated for Lottery HR (High-Risk) = 1 if Lottery choice is gamble 5 or 6. *Order* controls for order effects (1= if the first decision is with own money). *OPM* = 1 if decision is with other people's money and 0 for decisions with own money. Sample size is n= 380 for all regressions. Standard errors are reported in parentheses below the estimated coefficients. Individual coefficients are significant at ***p<0.01, **p<0.05, or *p<0.10

	Eckel & Grossman's gambles			Hypothetical choices	
Dependent variable:	Lottery (1)	Lottery HR (2)	Belief (3)	Job (4)	Lottery (5)
Order	0.352	0.076	-0.667	0.259	0.401
	(0.333)	(0.213)	(0.417)	(0.172)	(0.243)
OPM	-0.058	-0.254*	1.27***	-0.309***	0.089
	(0.213)	(0.153)	(0.360)	(0.097)	(0.098)
Female	-1.54***	-0.915***	-0.846**	-0.466***	-0.179
	(0.336)	(0.228)	(0.419)	(0.173)	(0.244)
Age	-0.086**	-0.016	-0.003	-0.032	-0.071**
	(0.037)	(0.024)	(0.046)	(0.020)	(0.029)
Intercept	6.83***	0.857	3.36***	3.91***	3.60***
	(0.967)	(0.628)	(1.20)	(0.515)	(0.751)
Prob>Chi^2	0.00	0.00	0.00	0.00	0.05

4. Conclusion

We use three different and well-established elicitation methods in order to study how people take risk on behalf of others. First we employ the Eckel and Grossman's (2002) gamble to elicit actual risk-taking behavior on behalf of own and others' money. Then we compare this with two hypothetical measures, the labor market choice by Barsky et al. (1997) and the investment choice used in the SOEP survey (see Dohmen et al., 2005). We also elicit beliefs about how others take risk with own and other people's money.

Overall we find only a weak tendency of lower risk-taking when decisions affect others compared with decisions that affect oneself. From the Eckel and Grossman framework we find that the averages are not significantly different, but there are significantly fewer subjects taking high risk with other's money compared with own money. From the labor market choice, risk-

taking is significantly lower when the choice involves another person; and from the investment choice, we find no signicant differences between managing own and other's money. In line with the *risk-as-value* hypothesis (Brown, 1965) we find that subjects perceive themselves as being more risk-seeking than others, and that others take less risk with their own money than with other people's money.

Our study complements a relatively recent line of research investigating self-other discrepancies in risk preferences. Although the *averages* indicate (like other studies) that people make quite similar decisions on behalf of others as on behalf of themselves, the within-subject analysis indicates that people act differently when taking risk for others. The majority of the subjects made different choices with others' money compared to own money. However, these decisions were not consistent over the different decision tasks. A large majority of subjects alternates between taking more risk, less risk or the same amount of risk with other people's money compared to own money. This could indicate that people act randomly, i.e. they minimize their effort when making risk decisions on behalf of others. Since decisions on behalf of others were not incentivized, random behavior is also in line with standard econmic theory.

Appendix

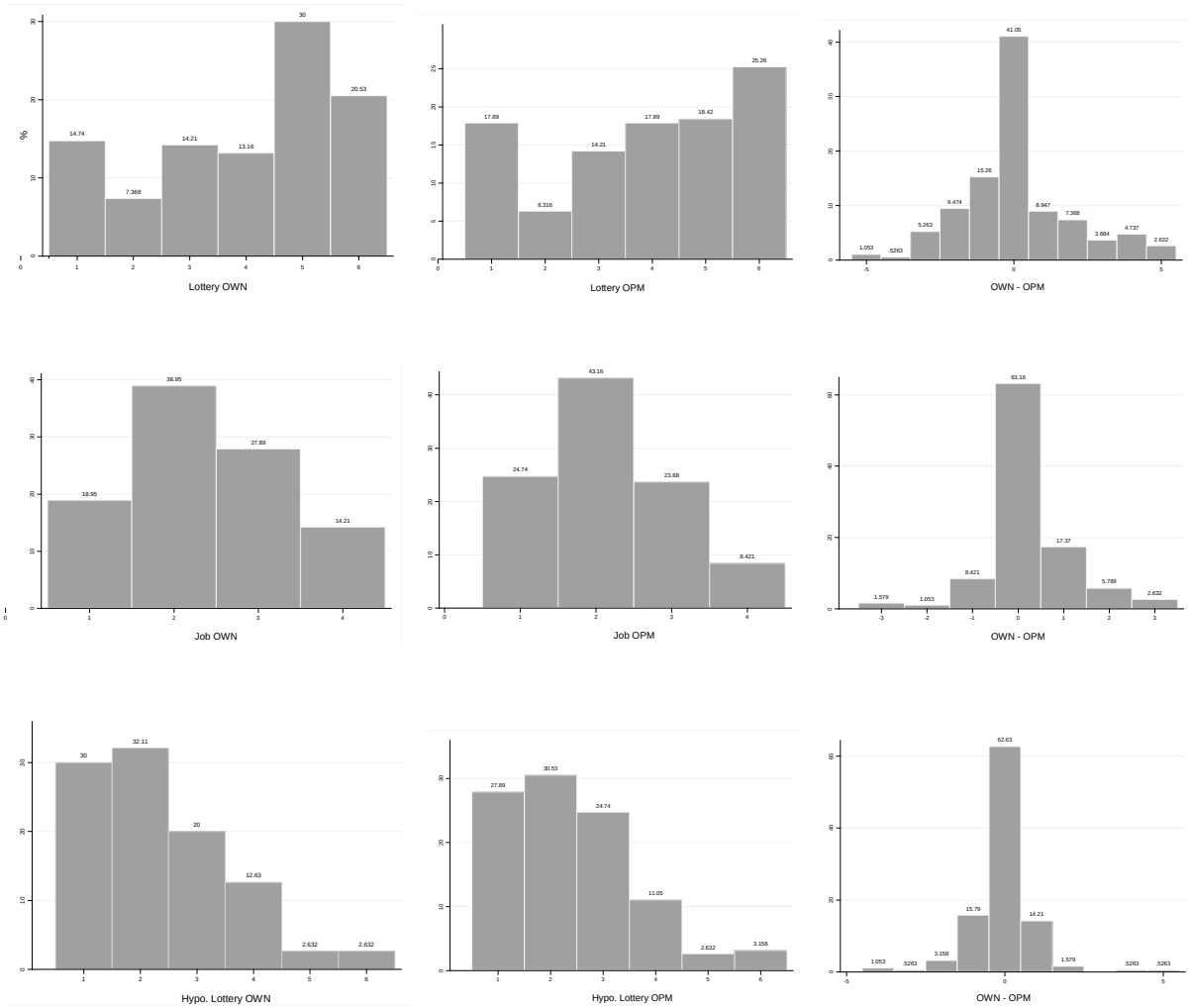


Figure A1: Distribution of decisions for the lottery, job, and hypothetical lottery task.

Table A1: Proportion of subjects who take more, less, or the same risk in OWN and OPM

	Lottery	Job	Hypothetical lottery
Decrease risk in OPM	27.37 %	25.79 %	16.84 %
Same risk	41.05 %	63.16 %	62.63 %
Increase risk in OPM	31.58 %	11.05 %	20.53 %

Table A2. Risk-taking with own and with other people's money by type and task.

	Lottery OWN	Lottery OPM	| OWN - OPM |	# obs.
Decrease risk in OPM	4.85 (1.09)	2.40 (1.35)	2.44 (1.36)	52
Same risk	4.23 (1.82)	4.23 (1.82)	-	78
Increase risk in OPM	2.90 (1.41)	4.72 (1.25)	1.82 (1.00)	60

	Job OWN	Job OPM	| OWN - OPM |	# obs.
Decrease risk in OPM	3.08 (0.79)	1.65 (0.60)	1.43 (0.68)	49
Same risk	2.21 (0.89)	2.21 (0.89)	-	120
Increase risk in OPM	1.67 (0.66)	3.05 (0.74)	1.38 (0.74)	21

	H.Lottery OWN	H.Lottery OPM	| OWN - OPM |	# obs.
Decrease risk in OPM	3.38 (1.24)	2.06 (1.01)	1.31 (0.90)	32
Same risk	2.20 (1.19)	2.20 (1.19)	-	119
Increase risk in OPM	1.90 (0.97)	3.26 (1.25)	1.36 (0.78)	39

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