Journal of Behavioral and Experimental Economics 57 (2015) 81–88

Contents lists available at ScienceDirect

Journal of Behavioral and Experimental Economics

journal homepage: www.elsevier.com/locate/socec

Group member characteristics and risk taking by consensus

Jeroen Nieboer*

Behavioural Research Lab, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, United Kingdom

ARTICLE INFO

Article history:
Received 16 June 2014
Revised 3 May 2015
Accepted 4 May 2015
Available online 8 May 2015

JEL classification:
C91
C92
D71
D80

Keywords:
Experiments
Choice under risk
Groups
Teams
Consensus

ABSTRACT

I investigate the effect of group members' individual characteristics on risk taking by groups in an investment experiment. I find that gender is the only of the characteristics that significantly affects risk taking, both for individual investments and group investment decisions by consensus. In individual decisions, women are more risk averse than men. In groups, risk aversion is increasing in the number of female group members. I make out-of-sample predictions of group decisions for different gender compositions based on the sample of individual preferences using simulation of various 'social decision schemes'. Generally, none of the schemes predicts group decisions well. These results pose new challenges for theories of preference aggregation in groups and have practical implications for organizations that rely on teams to make decisions under risk.

1. Introduction

Experimental and empirical research has greatly increased our knowledge of how choices under risk are affected by individual characteristics. Demographic, cultural and biological factors have been identified as determinants of risk attitudes and revealed preferences over financial risk.[1] What is largely unknown, however, is how these factors play out in collective choice. Since many important decisions are taken by collectives (e.g. committees, boards, working groups, teams), there is real value in improving our understanding of how group member characteristics affect outcomes. This paper contributes to the literature on group member characteristics with a laboratory experiment on a repeated investment decision with monetary incentives. In a between-subjects design, I measure the effect of characteristics of subjects that make the decision either individually or in a three-member group. I focus on four easily observable or obtainable characteristics: age, gender, university degree and nationality.

Experiments on group decisions are a useful complement to observational studies by virtue of the control that the researcher has over selection into groups. This is important because, in observational studies, the possibility of biased (self-)selection into groups allows for many explanations of the research findings. For example, various authors report that risk taking by corporate management teams is related to average age: younger teams take more risks (Tihanyi et al., 2000; Wiersema and Bantel, 1992). But it is unclear whether these findings indicate that these teams take more risks because they are younger, that teams who take more risks recruit younger members or that there is a third factor affecting both variables. To remove selection as an argument, I investigate group composition in a controlled experiment where subjects are randomly allocated to groups deciding by consensus. There is no fixed decision rule: group members interact through face-to-face conversation and are asked to submit a group decision.

There exists a small body of experimental research compare risk taking by individuals and groups (e.g. Bougheas, Nieboer, and Sefton, 2013; Masclet et al., 2009; Rockenbach, Sadrieh, and Mathauschek, 2007; Shupp and Williams, 2008; Sutter, 2007, 2009), but few of these studies focus on the role of group member characteristics. Sutter (2007) reports that groups are less risk averse than individuals and notes that "… results reported here do not depend on the gender of individuals or the gender composition of teams" (Sutter, 2007, p. 130). Ertac and Gurdal (2012a) measure the effect of individual characteristics and personality in subjects who make choices under risk on behalf of a group. Bogan, Just, and Dev (2013) investigate the effect of gender composition on group decisions by consensus in an

* Tel.: +44 2079557380.
E-mail address: j.nieboer@lse.ac.uk

[1] Evidence on biological factors is accumulating, such as pre-natal testosterone exposure (Brañas-Garza and Rustichini, 2011), parental influence (Dohmen et al., 2012) and genetic pre-disposition (Cesarini et al., 2009; Kuhnen and Chiao, 2009).

http://dx.doi.org/10.1016/j.socec.2015.05.001
2214-8043/

investment scenario. The above studies do not compare the effect of subjects' characteristics in individual versus group decisions with the same task, however. The present paper's key contribution is to provide such a comparison. This is an important step toward improving the descriptive and predictive performance of models of group decisions under risk.

I find that gender is the only individual characteristic that affects risk taking, in both individual and group decisions. Individual women are more risk averse than men and risk aversion in groups is increasing in the number of female group members. To systematically investigate the relationship between individual member characteristics and group decisions, I use simulation techniques to test five social decision schemes from the literature on continuous choice by small groups. None of the schemes predicts actual group decisions well: for the majority of schemes and group compositions, I reject the null that the actual group decision comes from the same distribution as the simulated decisions. These results pose a challenge with respect to modeling group decisions under risk. They also suggest that organizations that rely on groups and teams should be mindful of the complex relationship between group composition and decision-making dynamics.

2. Related literature

2.1. Individual characteristics and decisions under risk

One of the more robust empirical patterns in individual choice under risk is the gender effect: women are, on average, more risk averse than men (see Eckel and Grossman, 2008; Croson and Gneezy, 2009). A review of experiments with the investment game used in the present paper concludes there is "… a very consistent result that women invest less, and thus appear to be more financially risk averse than men." (Charness and Gneezy, 2012, p. 50). This effect in financial risk taking also appears outside the laboratory (Atkinson, Baird, and Frye, 2003; Barber and Odean, 2001, 2011; Dohmen et al., 2011).

Risk taking also seems to vary with age. Younger people have a lower perception of risk and take more risks than old people (Otani et al., 1992; Gardner and Steinberg, 2005). Studies with representative population samples confirm this relationship for measures of risk-taking in various domains of everyday decision-making (Dohmen et al., 2011; Nicholson et al., 2005).

Nationality and culture also matter, although their relationship with risk taking is more complex and potentially domain specific. Hsee and Weber (1999) and Lau and Ranyard (2005) report that (Hong Kong) Chinese students are more risk seeking than British students in hypothetical investment and gambling tasks. But Fong and Wyer (2003) find that Hong Kong Chinese and American students are equally risk seeking in hypothetical stock market investment choices, but Americans are more risk seeking in the domain of academic achievement.

2.2. Group composition and decisions under risk

There is a substantial literature on risk taking by corporate management teams, focusing on certain member characteristics. Education and age seem to be influential: higher-educated teams are more likely to take risks with new products (Bantel and Jackson, 1989); higher-educated and younger teams are more likely to expand internationally (Tihanyi et al., 2000) and more likely to initiate strategic change (Wiersema and Bantel, 1992). In contrast, there is no clear evidence on gender (Bansak, Graham, and Zebedee, 2011).

There exists, to my knowledge, one previous experimental study that looks at the effects of group composition on financial risk taking. Bogan, Just, and Dev (2013) investigate incentivized choices framed as investment portfolio decisions. The investments are choices between stock portfolios with different levels of risk and subject earnings depend on the subsequent performance of the portfolios. The authors systematically vary the gender composition of the groups and find that groups' risk-taking is increased by having a male in the group, although not strictly increasing in the number of male group members. The most risk-seeking groups in their experiment are male-dominated, but not all male. A related study is Ertac and Gurdal (2012a), who investigate the effect of gender on the willingness to make choices under risk on behalf of a group. They find that men are more willing to lead the group than women, and those males who volunteer as group leaders take more risk on behalf of their group than those who do not.

3. The experiment

3.1. Experimental design

The experiment consists of an investment task with two treatments: a treatment with individual investment decisions (IND) and a treatment with consensus investment decisions taken by groups during face-to-face discussion (GRP).[2] These treatments are replications of the experiment by Sutter (2007, 2009), based on the investment task introduced by Gneezy and Potters (1997) and programmed in *z*-Tree (Fischbacher, 2007). Since I use the same instructions, software, experimental parameters and incentive structure as Sutter (2009), a secondary objective of this paper is to replicate one of the results reported in his paper (and subsequently replicated in Bougheas, Nieboer, and Sefton, 2013): groups are less risk-averse than individuals.[3]

In the investment task, the decision-maker receives an endowment of 100 pence (1 pound sterling) and chooses how much to invest in a risky asset. With probability 2/3 the asset yields zero, and the decision-maker earns that part of her endowment that was not invested. With probability 1/3 the asset returns 3.5 times the investment, and so the decision-maker earns her endowment plus 2.5 times her investment. That is, if the decision-maker invests x her earnings in a round are given by:

$$\text{earnings} = \begin{cases} 100 - x \text{ with probability } 2/3 \\ 100 + 2.5x \text{ with probability } 1/3 \end{cases}$$

This task is repeated over nine rounds, with the asset returns determined by independent draws at the end of each round (using a computerized random number generator). Subjects learn the outcome and their earnings at the end of each round. Subjects get paid their earnings in all nine rounds. Expected earnings are strictly increasing in x, so a risk-neutral decision-maker would invest the full endowment ($x = 100$). Greater investments thus means more risk taking, but also higher expected earnings. If groups invest more than individuals, as in Sutter (2009), their risk taking may be driven by higher expected earnings. Bougheas, Nieboer, and Sefton (2013) present some evidence that groups operate in this way. It should be noted that the task is the same as that used in Ertac and Gurdal (2012a) but quite different from the portfolio selection task used by Bogan, Just, and Dev (2013), which was designed to closely match real-world investment management decisions. To mitigate the

[2] Note that the data from treatment IND were previously reported in Bougheas, Nieboer, and Sefton (2013).

[3] Instructions were taken from the English translations provided in Sutter (2009). The software was a set of a *z*-Tree (Fischbacher, 2007) treatment files, downloaded from the journal website at http://www.e-aer.org/data/dec09/20080341_data.zip and translated to English. Regarding incentives, I replace the €-sign with a £-sign for the two payment variables: the show-up fee (€ 2→£2) and round endowment (€ 1→ £1). This means that incentives in my experiment are higher than in Sutter (2009) in real terms. Using the Economist's 'Big Mac index' (http://www.bigmacindex.org) as suitable proxy for PPP, I estimate that the purchasing power of £1 in 2012 is 25% higher than €1 in 2008.