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On the stability of risk preferences: Measurement matters

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A number of recent papers have used the outbreak of the COVID-19 pandemic to investigate the stability of risk preferences. These studies are typically based on convenience samples and a variety of measures of risk preferences, including self-assessments and hypothetical lotteries, and report mixed, often insignificant, and partly contradictory evidence (see, e.g., Angrisani et al., 2020, for students and traders in London; Drichouts and Nayga, 2021, for students in Athens; Zhang and Palma, 2021, for online experiments on Amazon’s MTurk; and Shachat et al., 2021, for students in China). In contrast, work based on large representative household panel surveys, which have information also prior to the pandemic, typically find modest evidence for a decrease in self-assessed willingness to take risks, particularly among respondents who experienced severe financial losses due to the pandemic and who had pre-existing medical conditions (see, e.g., Graeber et al., 2020; Frondel et al., 2021 for surveys conducted in Germany). However, these studies do not elicit incentivized risk preferences.

This article contributes a systematic assessment of the stability of risk preferences in the context of the COVID-19 pandemic, among students in four countries. Our study leverages a survey design that comprises information collected among student samples in several countries prior to the outbreak of the pandemic and during the pandemic, and that contains both self-assessed (“stated”) measures of willingness to take risks and measures based on an incentivized lottery choice (“elicited” measures).

1. Introduction

Over the past years, much progress has been made on measuring risk preferences and their distribution in the population. While there is evidence for considerable heterogeneity of risk preferences and for their systematic changes over the life course, less is known about the stability of preferences in the context of extreme events (see Schildberg-Hörisch, 2018). Previous research suggests that health shocks, natural disasters, wars, and economic recessions affect the willingness to take risks, in some cases leading to lower willingness to take risks (see, e.g., Decker and Schmitz, 2016; Dohmen et al., 2016; Cassar et al., 2017), and, in other cases, to greater risk tolerance (see, e.g., Hanoka et al., 2018; Jakiela and Ozier, 2019).

We exploit the unique design of a repeated survey experiment among students in four countries to explore the stability of risk preferences in the context of the COVID-19 pandemic. Relative to a baseline before the pandemic, we find that self-assessed willingness to take risks decreased while the willingness to take risks in an incentivized lottery task increased, for the same sample of respondents. These findings suggest domain specificity of preferences that is partly reflected in the different measures.

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The results show a considerable heterogeneity in the response of willingness to take risks to the pandemic across different measures. In particular, we find that on average self-assessed willingness to take risks decreased whereas the willingness to take risks in an incentivized lottery task increased during the pandemic, for the same individuals.

2. Data and empirical strategy

Data. The data were collected at universities in different countries (Czechia, India, Mexico, and Spain) as part of a research project on language learning and migration intentions among university students. During the baseline survey, collected in 2019, prior to the outbreak of the COVID-19 pandemic, respondents were requested a permission to be contacted again for a follow-up survey, which took place in December 2020 and January 2021. We restrict the sample to countries with at least 20 respondents in the follow-up survey.2

In both waves, we collected the same two measures for risk attitudes: self-assessed willingness to take risks (“stated willingness to take risks”), and an incentivized lottery decision task (“elicited willingness to take risks”).3 To measure within-individual variation in willingness to take risks, we restrict the sample to those respondents with information on both measures in both surveys who were still students at the time of the follow-up survey.4 The estimation sample consists of 303 individuals with information on risk preferences from 9 universities in Czechia, India, Mexico, and Spain; the share of women in the sample is 57% and the median age is 21 years.5 The sample resembles typical student subject pools used in experimental studies, including in being subject to selective participation and sample selection. Nevertheless, with its unique setting of preference elicitation across several universities in different countries and with the focus of the analysis on within-subject variation, this sample offers a possibility to investigate the stability of risk preferences.

Empirical strategy. The analysis is based on the fixed-effects regression framework

\[
\text{Pref}_i = \alpha \cdot \text{Follow-up}_w + \beta \cdot \text{Follow-up}_w \times X_i + \xi_i + \epsilon_{iw} \tag{1}
\]

with \(\text{Pref}_i\) denoting a preference measure for respondent \(i\) in wave \(w\) (baseline, follow-up) and \(\text{Follow-up}_w\) denoting a binary indicator for responses given during the follow-up survey. The coefficient of interest regarding the effect of the pandemic on preferences is given by \(\alpha\) and \(\beta\) provides information about heterogeneity in the effect of the pandemic on preferences by individual characteristics \(X_i\) that are stable over time and that were elicited in the baseline survey (such as gender or age at the time of the baseline survey).

\[\text{Pref}_i = 2\text{. The timing of the baseline varied across countries and universities. See Online Appendix Figure A1.}\]

\[\text{Pref}_i = 3\text{. The self-assessment about risk preference is the response to the question “Would you describe yourself as someone who tries to avoid risks (risk-averse) or as someone who is willing to take risks (risk-prone)” with responses on a scale 1–10. The incentivized question is the response to the following question: “Assume that you win the first of the two additional lotteries and obtain €100. You have to decide now how much of the amount of €100 you want to invest in a risky asset. The risky asset loses the invested money with a probability of 1/2 and gives you 2.5 times the invested amount with a probability of 1/2. For example: if you do not invest anything, you keep the €100, if you invest everything, you end up with either €0 or €250”, with responses on a scale 0–100. For a similar approach, see, e.g., Falk et al. (2018). We also collected comparable measures for time preferences, shown in the Online Appendix.}\]

\[\text{Pref}_i = 4\text{. Around 30% of respondents reply negatively to the question about student status in the follow-up survey. To rule out contamination of treatment from graduation and job search, we exclude these respondents from the sample.}\]

\[\text{Pref}_i = 5\text{. Descriptive statistics can be found in Online Appendix Table A2.}\]

3. Empirical results

Cross-tabulations. Comparing self-reported risk preference in the baseline survey in 2019 to the follow-up survey during the pandemic, 30% of the respondents gave the same answer in both surveys, while 43% (28%) of respondents reported a lower (higher) willingness to take risks in the follow-up survey (see Online Appendix Table A4). Most of the changes are minor: 64% of respondents reported either exactly the same risk preference, or changed their answer by one choice category. For elicited risk preference (see Online Appendix Table A5), 26% of respondents were in the same 10€-bin in both surveys, while 28% (46%) chose lower (higher) risky investment in the follow-up survey, and 45% of respondents chose risky investment in both surveys in either the same or in the adjacent range. This suggests that risk preferences move, on average, in opposite directions when using self-reported and elicited risk-taking.

Regressions. Table 1 presents the econometric analysis of the effect of the exposure to the COVID-19 pandemic on stated risk preferences (Panel A) and on elicited risk preferences (Panel B) for different specifications. The results in Panel A suggest that the stated willingness to take risks declined during the pandemic. This decline is particularly pronounced among female respondents aged 20 and younger. The results in Panel B provide a completely different picture: The willingness to invest in a risky lottery increased, and this is mainly the case for male respondents aged 21 and older.

Our results cast doubt on a uniform effect of the pandemic on risk preferences. Instead, the findings seem to hinge critically on the specific measures of risk preferences, which differ conceptually regarding the perception of risk exposure and the context. In particular, the stated risk preference has been shown to be a good overall measure of risk attitudes across various domains besides the financial domain, including, in particular, health-related risks (see, e.g., Dohmen et al., 2011). In contrast, the elicited risk preference refers to the conventional incentivized elicitation protocol in the financial domain. While the stated risk measure is more ambiguous regarding the risks involved in the individual assessment, the elicited risk measure is explicitly about financial risk taking and involves exact stakes and probabilities, which might induce responses to be influenced by the particular financial context of the respondent. The salience of these differences might vary across gender and age.

Overall, the seemingly contradictory responses of individuals in our sample that exhibit simultaneously increasing and decreasing risk preferences, depending on the measure, shed new light on the inconclusive evidence in the literature. The findings therefore raise a note of caution about measuring the stability of risk preferences using a single measure. Moreover, the heterogeneous findings seem to be driven by distinct subsamples in terms of gender and age. This suggests a potentially important role of heterogeneity in the stability of preferences in different domains that deserves attention in future research.6 The main threat to identification is self-selection to repeat participation. Extensive analysis of self-selection suggests that selective participation in the follow-up survey is unlikely to explain our results.

More systematic work is needed for a better understanding of the stability of preferences and its relationship to different survey measures.

\[\text{Pref}_i = 6\text{. We also found heterogeneous yet insignificant effects for time preferences, using similar self-reported (stated) measures or incentivized (elicited) measures. See Online Appendix Tables A6 to A8.}\]
Table 1
The effect of the COVID-19 Pandemic on risk preferences.

| Subgroup                  | Full Sample | Females Age < 21 | Females Age ≥ 21 | Males Age < 21 | Males Age ≥ 21 |
|--------------------------|-------------|------------------|------------------|----------------|----------------|
|                          |             | (1)              | (2)              | (3)            | (4)            |
| Follow-up                | −0.389***   | −0.086           | −0.592***        | −0.824***      | −0.381         |
|                          | (0.151)     | (0.228)          | (0.222)          | (0.282)        | (0.279)        |
| Follow-up × Female       | −0.525*     |                  |                  |                |                |
|                          | (0.303)     |                  |                  |                |                |
| Follow-up × I(age ≥ 21)  |                | 0.393            |                  |                |                |
|                          |              | (0.302)          |                  |                |                |
| Respondent FEs           | ✓           | ✓                | ✓                | ✓              | ✓              |
| Observations             | 606         | 606              | 606              | 182            | 168            |
| R²                       | 0.79        | 0.79             | 0.79             | 0.76           | 0.79           |

Panel B: Elicited willingness to take risks

| Subgroup                  | Full Sample | Females Age < 21 | Females Age ≥ 21 | Males Age < 21 | Males Age ≥ 21 |
|--------------------------|-------------|------------------|------------------|----------------|----------------|
|                          |             | (1)              | (2)              | (3)            | (4)            |
| Follow-up                | 6.561**     | 9.430**          | 3.327            | 5.297          | 3.560          |
|                          | (2.616)     | (4.262)          | (3.368)          | (4.419)        | (4.911)        |
| Follow-up × Female       | −4.967      |                  |                  |                |                |
|                          | (5.377)     |                  |                  |                |                |
| Follow-up × I(age ≥ 21)  | 6.282       |                  |                  |                |                |
|                          | (3.189)     |                  |                  |                |                |
| Respondent FEs           | ✓           | ✓                | ✓                | ✓              | ✓              |
| Observations             | 606         | 606              | 606              | 182            | 168            |
| R²                       | 0.69        | 0.70             | 0.70             | 0.71           | 0.70           |

Note: Standard errors, clustered at the respondent level, in parentheses.

* p < 0.10.
** p < 0.05.
*** p < 0.01.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.econlet.2021.110172.

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