LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT
UNIVERSIDADE DE LISBOA

Programming Techniques Project

1º Sem. 2019/2020

Implementing a Holt and Laury (2002) Multiple Price List lottery in oTree

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ISEG, 10th December 2019

IMPLEMENTING A HOLT AND LAURY (2002) MULTIPLE PRICE LIST LOTTERY IN OTREE

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ABSTRACT

1 INTRODUCTION

This report explains the process of implementing a version of the Multiple Price List (MPL) lottery proposed in Holt and Laury 2002 in oTree, Chen, Schonger, and Wickens (2016), and the data...

By incentivizing participation in the experiment, participants are more likely to reveal their true risk preferences when compared with more traditonal methods such as questionaires.

2 LITERATURE REVIEW

The Multiple Price List approach popularized by Holt and Laury (2002) has emerged as a simple, yet powerful framework for eliciting individual risk preferences and to estimate parameters of individual utility functions. As of December 2019, the paper has been cited more than 1900 times in the Web of Science [1] making it a tremendously influnetal paper in the domain of experimental and behavioral economics, whose methodology has been applied in a vast array of contexts.

The work by Holt and Laury (2002) has motivated the development of other methods to elicit personal risk preferences. Charness, Gneezy, and Imas (2013) reviews some common methods of measuring individual risk preferences, where the MPL method is highlighted as a complex method. Complex meaning that it carries a risk of getting skewed results if participants do not understand the instructions of the experiment. In addition, if participants are allowed to switch between the alternatives freely, inconsistent results may be the result. Charness, Gneezy, and Imas (2013) mentions a selection of studies where significant inconsistent behavior was recorded.

Drichoutis and Lusk (2016) argues that the Holt and Laury (2002) method may not be the best approach to elicit risk preferences, and develops and extended version where the choices are made over a

One key assumption in Holt and Laury (2002) is that the theory of Constant Relative Risk Aversion holds (CRRA).

Given this assumption

[1] LINK

3 EMPIRICAL WORK

3.1 Experiment

In this report I chose to employ a simplified version of the Holt and Laury (2002) Multiple Price List Experiment. I decided to limit the experiment to one round and eight choices, thus, the value of the resulting data is limited. The decision to limit the lottery tho eight choices was made due to a technichal error arising if the tenth choice was randomly drawn by the computer. Additional simplifications were made in order to ensure that I was able to get my classmates to participate. Even though there was an incentive for participation in the experiment, they are not necessarily compatible, and the preferences revealed in the lotteries are therefore not robust.

The experiment I asked my classmates to participate in had the following instructions:

A Simple Lottery

> In this experiment you will take part in a lottery with the chance to win a prize. You will be presented with "Choices".
>
> For each Choice you will pick an Option, A or B, which will give you two possibilities for winning a certain amount of points. When you are done, the computer will at random pick one of the Choices. Then the computer will check which Option you chose and draw your payoff according to the probability distribution of your picked Option in that Choice.
>
> Before we start, please indicate your name, and tell us about your attitude towards risk.

The users were asked to enter their name for the purpose of drawing a prize during the presentation, and indicate their preferences for risk by choosing between the following alternatives:

1. I prefer to avoid risks
2. I am neutral towards risks
3. I like taking risks if I can gain from it

The next page consists of the choices the participants were asked to make.

The choices and their respective payoffs and expected values are displayed in the table below. Where p represents the probability of the high payoff being drawn, and $1 - p$ the probability of the low payoff being drawn.

The Difference column shows the difference between the expected value of chosing A over B. Implying, that someone who is perfectly neutral towards risk would choose to switch from A to B at the 4th choice.

TABLE I: Probabilities, choices and expected values

p	$1-p$	A_{High}	A_{Low}	B_{High}	B_{Low}	$E[A]$	$E[B]$	Difference
0.125	0.875	200	160	385	10	165.0	56.875	108.125
0.250	0.750	200	160	385	10	170.0	103.750	66.250
0.375	0.625	200	160	385	10	175.0	150.625	24.375
0.500	0.500	200	160	385	10	180.0	197.500	-17.500
0.625	0.375	200	160	385	10	185.0	244.375	-59.375
0.750	0.250	200	160	385	10	190.0	291.250	-101.250
0.875	0.125	200	160	385	10	195.0	338.125	-143.125
1.000	0.000	200	160	385	10	200.0	385.000	-185.000

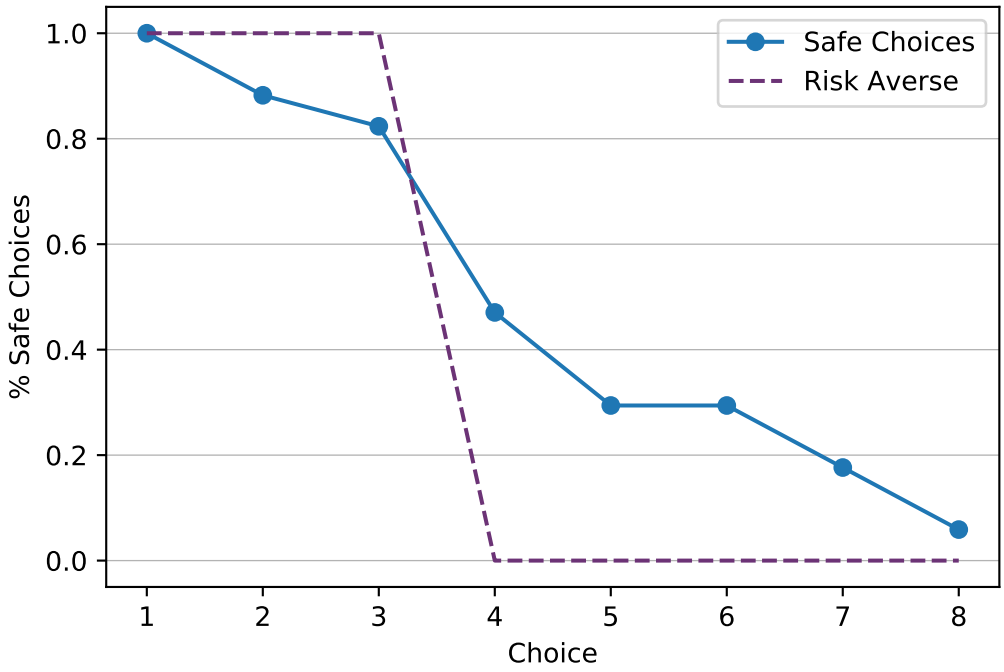

FIGURE 1: Choices of sample versus risk averse choices

3.2 Implementation

The experiment was implented in oTree Chen, Schonger, and Wickens (2016), which is an open source framework for designing economics experiments. It is based on Python, and uses Django to create a front-end for users to participate in experiments.

Holzmeister (2017) made an implementation of the Holt and Laury (2002) MPL in oTree

The code for this project is available on GitHub [2]

3.3 Deployment

[2] GitHub repository: `https://github.com/olafghanizadeh/hl_mpl`.

4 CONCLUSION

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