

Charles University in Prague

Faculty of Social Sciences

Institute of Economic Studies



MASTER THESIS

Choice Judgment Discrepancy and Inequality Aversion in Earnings: Evidence from the Republic of Moldova

Author: **Corina Beșliu**

Supervisor: **PhDr. Michal Bauer**

Academic Year: **2010/2011**

Declaration of Authorship

I hereby declare that I compiled this thesis independently, using only the listed resources and literature. I grant permission to the Charles University to reproduce and distribute copies of this master thesis in whole or in part.

Prague, January 14, 2011

Corina Beşliu

Acknowledgements

I want to thank my supervisor, Michal Bauer, for his most helpful suggestions and guidance during the writing of my thesis. I am also extremely grateful to him for his encouraging attitude towards my work.

I would like to thank my family as well for their full support throughout the whole period of my studies. Without it I would not be able to bring this research to its finality.

Abstract

Nowadays BE deals with many other issues besides loss aversion and the preference for fairness mentioned above. There are many works which examine such phenomena like the endowment effect, or the framing effect, the inequality aversion and the judgment choice discrepancy, the money illusion, or the mental accounting. This thesis will examine two of these topics: the discrepancy between choice and judgment and the inequality aversion. It will also try to prove that besides material payoffs there exist nonmaterial payoffs, which influence people's choices through their judgments and can be crucial in some situations, leading sometimes even to reversals in preferences.

JEL Classification: C51, C83, D03

Keywords: Behavioural Economics Choice Judgment Discrepancy, Inequality Aversion

Author's email: besliu_c@yahoo.com

Supervisor's email: bauerm@fsv.cuni.cz

Table of Contents

| | |
|--|-------------|
| List of Tables | vii |
| List of Figures | vii |
| Abbreviations | viii |
| Master Thesis Proposal | ix |
| Chapter 1 | 1 |
| 1. Introduction | 1 |
| Chapter 2 | 4 |
| 2. Choice Judgment Discrepancy and Inequity Aversion | 4 |
| 2.1. Behavioral Economics | 4 |
| 2.2. Tversky and Griffin's and the Choice Judgment Discrepancy | 10 |
| 2.3. Fairness in Economics and Inequity Aversion | 12 |
| 2.3.1. Inequity aversion or Inequality aversion? | 13 |
| Chapter 3 | 15 |
| 3. The Research Methodology, Design and Hypothesis | 15 |
| 3.1. Survey Methodology | 15 |
| 3.2. The Between Subject Design | 17 |
| 3.3. The Sample and the Survey | 18 |
| 3.4. The Questionnaires | 19 |
| 3.4.1. First type of questionnaire | 19 |
| 3.4.2. Second Type of Questionnaires | 21 |
| 3.4.3. Explanations to questionnaires | 21 |
| 3.5. The Research Hypothesis | 23 |
| 3.5.1. Tversky and Griffin and the present research | 23 |
| 3.5.2. Extensions to Tversky's and Griffin's research | 23 |
| 3.5.2.1. Preference Reversals | 23 |
| 3.5.2.2. Inequality Aversion Hypothesis | 24 |
| 3.5.2.2.1. Inequality Aversion or Altruism? | 25 |
| Chapter 4 | 28 |
| 4. The Survey Results | 28 |
| 4.1. First Hypothesis | 28 |
| 4.1.1. Discrepancy between choice and judgment | 28 |
| 4.1.2. Preference Reversals | 29 |
| 4.2. Second Hypothesis | 33 |
| 4.2.1. The Econometric Model | 33 |
| 4.2.2. Estimating IA in the revealed choice questionnaires | 35 |
| 4.2.2.1. General estimations with variable Age continuous | 35 |
| 4.2.2.1.1. Partial effects (Age Continuous) | 37 |

| | | |
|--|---|-----------|
| 4.2.2.2. | Testing for dependency between variable Age and variable Stud | 41 |
| 4.2.2.3. | General estimations with variable Age dummy | 42 |
| 4.2.2.3.1. | Partial effects (Age Dummy) | 44 |
| 4.2.3. | Estimating IA in the questionnaires reflecting judgment | 46 |
| 4.2.3.1. | General estimations with variable Age continuous | 46 |
| 4.2.3.1.1. | Partial effects (Age continuous) | 50 |
| 4.2.3.2. | Testing for dependency between variable Age and variable Stud | 53 |
| 4.2.3.3. | General estimations with variable Age dummy | 54 |
| 4.2.3.3.1. | Partial effects (Age Dummy) | 55 |
| Chapter 5 | | 56 |
| 5. Conclusions and More Appropriate Behavioral Models | | 56 |
| 5.1. | Conclusions | 56 |
| 5.2. | More Appropriate Behavioral Models | 58 |
| 5.2.1. | Fehr and Schmidt Model | 59 |
| Bibliography | | 61 |
| Calculations | | 63 |

List of Tables

| | |
|---|----|
| Table 1 Summary statistics of measure variables..... | 19 |
| Table 2 Salary Options I | 19 |
| Table 3 Salary Options II | 20 |
| Table 4 preference reversals in numbers and percent..... | 29 |
| Table 5 Probabilities of outcomes for revealed choice (Age continuous) | 35 |
| Table 6 Ordered probit general estimations for revealed choice (Age continuous) | 36 |
| Table 7 Estimated partial effects for revealed choice (Age continuous)..... | 38 |
| Table 8 Estimated OLS Age/Stud, for revealed choice | 42 |
| Table 9 Ordered probit general estimations for revealed choice (Age dummy)..... | 43 |
| Table 10 Probabilities of outcomes for revealed choice (Age dummy)..... | 43 |
| Table 11 Estimated partial effects for revealed choice (Age dummy) | 44 |
| Table 12 Probabilities of outcomes for judgment (Age continuous)..... | 46 |
| Table 13 Ordered probit general estimations for judgment (Age continuous)..... | 47 |
| Table 14 Average characteristics for the two subsamples: choice and judgment | 49 |
| Table 15 Estimated partial effects for judgment (Age continuous)..... | 51 |
| Table 16 Estimated OLS Age/Stud, for judgment | 53 |
| Table 17 Ordered probit general estimations for revealed choice (Age dummy)..... | 54 |
| Table 18 Probabilities of outcomes for revealed choice (Age dummy)..... | 54 |
| Table 19 Estimated partial effects for judgment (Age dummy) | 55 |

List of Figures

| | |
|--|----|
| Figure 1 Age distribution for preference reversals (case of revealed choice)..... | 31 |
| Figure 2 Gender distribution for preference reversals (case of revealed choice)..... | 32 |
| Figure 3 Gender distribution for preference reversals (case of judgment)..... | 32 |
| Figure 4 Probabilities of outcomes for revealed choice (Age continuous)..... | 36 |
| Figure 5 Probabilities with change in variable Age (for choice) | 39 |
| Figure 6 Probabilities with change in variable Fem (for choice)..... | 40 |
| Figure 7 Probabilities with change in variable Stud (for choice) | 40 |
| Figure 8 Probabilities with change in variable Trans_1 (for choice)..... | 41 |
| Figure 9 Probabilities of outcomes for revealed choice (Age dummy) | 44 |
| Figure 10 Probabilities with change in variable Age_gr_1 (for choice) | 45 |
| Figure 11 Probabilities with change in variable Age_gr_3 (for choice) | 46 |
| Figure 12 Probabilities of outcomes for judgment (Age continuous) | 47 |
| Figure 13 Probabilities with change in variable Age (for judgment) | 52 |
| Figure 14 Probabilities with change in variable Stud (for judgment) | 53 |
| Figure 15. Probabilities of outcomes for judgment (Age dummy) | 55 |
| Figure 16 Preferences with inequity aversion | 60 |

Abbreviations

| | |
|-----|---------------------------|
| BE | Behavioral Economics |
| SEM | Standard Economic Model |
| BEM | Behavioral Economic Model |
| DUM | Discounted Utility Model |
| T&G | Tversky and Griffin |
| BO | Bolton and Ockenfels |
| FS | Fehr and Schmidt |

Master Thesis Proposal

Institute of Economic Studies
Faculty of Social Sciences
Charles University in Prague

| | | | |
|------------------------|---------------------|-------------------------|--|
| Author: | Corina Besliu | Supervisor: | Michal Bauer PhD. |
| E-mail: | besliu_c@yahoo.com | E-mail: | bauerm@fsv.cuni.cz |
| Phone: | 777177303 | Phone: | 222 112 329 |
| Specialization: | Economics & Finance | Defense Planned: | February 2011 |

Proposed topic:

Choice Judgment Discrepancy and Inequality Aversion in Earnings: Evidence from the Republic of Moldova

Economics is the science concerned with developing numerous models which predict human economic behavior. Very often though, we witness that people's behavior, in the real world, deviates from the outcomes predicted by economical theory. This is the moment when the intervention of Behavioral Economics is needed to correct for these shortcomings and increase the explanatory power of economics by enriching the standard economic models with psychological insights on human behavior.

Topic Characteristics:

The first issue with which the present thesis deals is the divergence between people's judgments and their actual choices. To examine this phenomenon the author will present one of the numerous situations when people, having the same set of options, rank their preferences in a different ordering when they are being asked to make a choice than when they are being asked to rank those options according to the level of happiness they would bring them. The second issue deals with inequality aversion. There will be tested whether the subset of people examined in this research are prone to inequality aversion, or in other words if these people show preference towards options offering them and others equal outcomes rather than the options offering them a disadvantageous inequality or also an advantageous one.

Hypothesis:

In the first instance this thesis will replicate an experiment carried out in 2000 by Tversky and Griffin. It will test whether the discoveries of the two scientists apply to other groups of respondents; specifically it will check the hypothesis that given three choice options of possible jobs, with different levels of payment, people will not always make their decisions

according to the predictions of the standard economic model. First of all they are expected to have different ordering in their preferences when they will rank their actual choices from the ones when they will have to rank their judgments. Another part of this hypothesis is that judgment influences choice and this influence can become as significant as it will change people's decisions regarding their earlier choices.

The second hypothesis tests if people from the Republic of Moldova are inequality averse. That is determined in the following way: if people rank the third option, that is the option with equal payoffs for everybody, higher than the other two options or higher than at least one of them, that means that they are inequality averse; in the reverse case they are considered not to be prone to inequality aversion.

Methodology:

The research results will be based on data accumulated from a survey. There will be created two types of questionnaires and spread among respondents. The sample to be interviewed will contain 300 random people, from the capital of the Republic of Moldova, Chisinau, with random occupations, in order to offer the research a more generalized view. The survey will be conducted in Romanian and Russian and will use the door to door approach.

Outline:

- 1. Introduction**
- 2. Choice Judgment Discrepancy and Inequity Aversion**
 - 2.1. Behavioral Economics
 - 2.2. Tversky and Griffin's and the Choice Judgment Discrepancy
 - 2.3. Fairness in Economics and Inequity Aversion
- 3. The Research Methodology, Design and Hypothesis**
 - 3.1. Survey Methodology
 - 3.2. The Between Subject Design
 - 3.3. The Sample and the Survey
 - 3.4. The Questionnaires
 - 3.5. The Research Hypothesis
- 4. The Survey Results**
 - 4.1. First Hypothesis
 - 4.2. Second Hypothesis
- 5. Conclusions and More Appropriate Behavioral Models**
 - 5.1. Conclusions
 - 5.2. More Appropriate Behavioral Models

Bibliography:

- N. Wilkinson (2008) “*An Introduction to Behavioral Economics*”, Richmond, The American International University in London (2008)
- Tversky, A. and Griffin, D. (2000) “Endowments and Contrasts in Judgment of well-being. In d. Kahneman and A. Tversky (Eds), *Choices, Values and Frames*. New York: Cambridge university Press and the Russel Sage Foundation
- Loewenstein, Sicherman “*Do Workers Prefer Increasing Wage Profiles?*”, *Journal of Labour Economics*, vol. 9, The University of Chicago (1991)
- Morris Altman “*Handbook of Contemporary Behavioural Economics. Foundations and Developments*”, M.E. Sharpe (2006)
- Agell, J. and Lundborg, P. (1995). Theories of pay and unemployment: Survey evidence from Swedish manufacturing firms. *Scandinavian Journal of Economics*
- Argyle, M. (1999) Causes and correlates of happiness. In D. Kahneman, E. Diener, and N. Schwarz (Eds), *Well-being: The Foundation of Hedonic Psychology*. New York: Russel Sage.
- Bell, D. (1985). Disappointment in decision making under uncertainty. *Operations Research*, 33
- C.F. Camerer, G. Loewenstein, and M. Rabin (2004). *Advances in Behavioral Economics*. Princeton University Press and Russell Sage Foundation.
- R.M. Groves, F.J. Fowler, M.P. Couper, J.M. Lepkowski, E. Singer, and R. Tourangeau (2009). *Survey Methodology*. Second Edition. John Wiley & Sons, Inc., Hoboken, New Jersey

Prague, March 9, 2010

Signature of the Supervisor

/PhDr. Michal Bauer/

Chapter 1

1. Introduction

Behavioral economics is one of the most controversial currents in economics nowadays. It is also one of the most novel areas of economics and as everything new it encounters countless obstacles before finding general approval and acceptance. Yet if looking back in history we will see that the ideas treated in BE are far from being new. BE is like a compromise between psychology and economics, or better, it is the same economics, but enriched with psychological insights on human behavior. Unlike the later works of neoclassical economists, who reject academic psychology, the earlier economists used to incorporate in their works both psychological and economical motivations when describing human behavior. They did not make a distinction though between the two because when economics was identified as a distinct field of study, psychology did not exist as a discipline yet. Still their works are full of observations and judgments about psychological principles of people's actions. Take for example A. Smith with *The Theory of Moral Sentiments*, the name of the book speaks for itself. Smith writes there the following: "we suffer more... when we fall from a better to a worse situation, than we ever enjoy when we rise from a worse to a better". By these words, without knowing it yet, he brought up one very interesting question treated very often today in BE - the loss aversion. Another good example is F. Edgeworth's *Theory of Mathematical Psychics*, where he demonstrates, in the well known "box" diagram, that the utility of a person is affected by the payoff of another person.

Nowadays BE deals with many other issues besides loss aversion and the preference for fairness mentioned above. There are many works which examine such phenomena like the endowment effect, or the framing effect, the inequality aversion and the judgment choice discrepancy, the money illusion, or the mental accounting. This thesis will examine two of these topics: the discrepancy between choice and judgment and the inequality aversion. It will also try to prove that besides material payoffs there exist nonmaterial payoffs, which influence people's choices through their judgments and can be crucial in some situations, leading sometimes even to reversals in preferences.

The choice judgment discrepancy is maybe not the most popular topic in BE and probably till Tversky and Griffin (2000) it did not receive that much of attention. Yet it could be very important and could influence people's behavior more than one would expect. This thesis axes itself on the idea that people show different inclinations when it comes to their judgments than when it comes to making actual choices. The reason for these different orderings is that while choices are determined mostly by material payoffs, judgments are more sensitive to the nonmaterial payoffs and costs. But it is neither the reason, nor the existence of this divergence, what makes the subject so important. What determined me to examine this matter and what gives it significance is that, despite the discrepancy between the two phenomena, both of them have a significant influence over each other and they both seem to be important in the decision making process. Judgment can influence choice. There will be made an attempt to demonstrate that in certain situations this influence can be as big as it will reverse people's choices making them absolutely inconsistent with the standard economic models' predictions.

If talking about inequity aversion, this is rather a more common topic in BE and it can be included in the broader topic of fairness. There have been made plenty of researches in this area, starting with Kahneman, Knetsch and Thaler (1986) and ending with Fehr and Schmidt (1999) who even created an economic model to predict the behavior of inequity averse people. Another similar model was created by Bolton and Ockenfels, which is often referred to as the ERC model - the equity, reciprocity and competition model. The relevance of the subject resides in the countless possible implications of social preferences for some decisions made by firms or even governments. Akerlof and Yellen (1990) introduced the fair wage-effort hypothesis, which stated that workers start withdrawing their effort as soon as their wage falls short of their fair wage. They also explain the effects of such behavior on the unemployment rate. Agell and Lundborg proved in 1995 that firms set their wages constrained by the employees' views about what constitutes a fair wage. A similar study was made by Bewley in 1998 whose findings were very analogous. Both of them provide evidence on the fact that a very strong reason for firms not to cut down on wages is the fear that their employees will see this as being unfair, which will affect negatively their work morale and through this the firm's profits. In a similar way inequality aversion can have key implications on the policies adapted by firms. For example if it is proved that a very big

fraction of employees are inequality averse, then having a very large range of salaries might be not the best idea, since it will be perceived as being unfair from both sides (the ones who will have higher salaries and the ones with the lower salaries). Thus the usual incentives of higher payments for better performance might not have the expected effects; even more, they could damage the workers' morale and productivity, especially for the ones who receive the lower payments. In this case employers have to search for other incentives, which would fit better the psychological profile of their employees. If talking about the governmental level, policies which tend to create equal opportunities and equal possibilities will be most likely to gain popularity among inequality averse people. Thus if the hypothesis about inequality aversion in the present thesis proves to be true, there will be disclosed a very important pattern for a large group of people. This pattern could be common not only for the Republic of Moldova, but maybe for other post soviet countries as well. In this case there should be used other models to predict human behavior, rather than the ones developed by neoclassical economists. Also firms and governments in such countries should chose their policies taking account of their people's preferences for fairness.

The thesis consists of five chapters. The first chapter is the introduction of the topic. The second one starts with a deeper explanation about what is behavioral economics, which are the weaknesses of the standard economic models and how behavioral models could help correct for these. Also here the concepts of fairness, inequity aversion and inequality aversion are being explained. Chapter number three describes the methodology of the research, the design and the hypothesis. It also gives an example of the questionnaires used for gathering the necessary data. Chapter 4 tests the first hypothesis and presents the results with some comments on them. For the second hypothesis (about inequality aversion) there is created an econometric model which tests for the presence of inequality aversion among respondents. With the help of this model it will be determined also how such characteristics like gender, age, income and education level could influence the level of inequality aversion of a person. Finally the last chapter, Chapter 5, presents author's conclusions on her findings and some suggestions of how to overcome the shortcomings of SEM with the help of behavioral models.

Chapter 2

2. Choice Judgment Discrepancy and Inequity Aversion

2.1. Behavioral Economics

Economics is a science which tries to explain all phenomena which relate to any aspect of human behavior involving allocation of scarce resources (N. Wilkinson 2008). It builds theories which predict the economic behavior of people, based on certain assumptions and premises.

However these theories often prove to be inaccurate and generate false predictions, which eventually lead to incorrect actions (e.g.: faulty governmental policies, erroneous providing of incentives by employers to their employees, etc.). The main cause of such miss-predictions is that frequently the assumptions on which the theory is based are flawed. Sometimes they are contradicted by field observations and sometimes they just prove to be useless under certain circumstances. This is exactly the point where Behavioral Economics becomes relevant, since it corrects for the earlier flaws, by modifying one or two assumptions towards a greater psychological realism and thus provides better predictions of field phenomena.

BE is rather a new discipline, which emerged from the necessity to explain diverse shortcomings of the classical economic theory. According to Loewenstein, Camerer and Rabin, BE increases the explanatory power of economics by providing it with more realistic psychological foundations (C.F. Camerer, G. Loewenstein, and M. Rabin 2004). It can be considered a new branch of economics, representing a reunification of psychology and economics into a whole, which uses observations of economic behavior, testing of hypothesis and construction of generalizations based on those observations, in order to understand and build an appreciation of the economic mind and economic behavior.

“Behavioral economics presents economics with a fine opportunity, as it represents a fresh approach to economic thinking that is explicitly formed and engaged with the social and personal aspects of economic life, such as relationships between actors and things, emotional states and the importance of temporality.” (S. Ross, 2009)

There are three main themes which BE usually addresses. The first one is Framing. It has to do with the idea that people's responses in terms of values, attitudes and preferences depend on the context and procedures involved in eliciting these responses. A simple example to make the issue more clear is the experiment when people are being asked about their overall level of happiness and their answers are influenced a lot by the prior question about how many dates they have had in the recent time period. The "Asian Disease" (Tversky and Kahneman, 1981) is also a very good illustration of framing effects. In this case there is presented a situation of preference reversal due to a change in formulation of the problem. The experiment was as follows:

People were given the information below.

"Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume the exact scientific estimate of the consequences of the programs are as follows:"

The first group of participants was given the two options beneath and asked to choose one of them.

"A) 200 people will be saved

B) There is a one-third probability that 600 people will be saved, and a two-third probability that no people will be saved"

The second group of participants was given the same two options, but formulated in a different way.

C) "400 people will die

D) There is a one-third probability that nobody will die, and a two-third probability that 600 people will die"

In the first group the percentage of people who chose program A over program B was 72%. In the second group 78% chose program D (which is nothing else but program B just framed in a different way) over program C (which is same as program A, but again framed differently). We can see here a total reversal of preferences: when the programs were presented in terms of saved lives most people chose program A, but when the programs were

presented in terms of expected deaths people switched drastically their preferences and chose program D over C.

The framing problem involves violation of one of the principles, on which neoclassical theories are based, the invariance principle.¹ This paradigm is not unique; it happens quite often in everyday life that people's choices depend very much on the way their options were framed. Unfortunately in such instances SEM will not help much. SEM is unable to make right predictions about human behavior when certain classical axioms of the rational behavior do not hold. Yet there have been developed other theories about people's rational behavior, such as the Prospect Theory², but this time by behavioral economists, who tried to take account of different anomalies in people's economic behavior.

The second topic very often treated by BE is Market Inefficiencies. It describes the mispricing, non-rational decision making, and return anomalies on the stock markets. An eloquent example to this section would be the Equity Premium Puzzle. It describes the well know situation present on the stock exchange markets, when the return on stocks is much higher on average than the return on bonds. If following the SEM, such an outcome would imply an unrealistically high risk aversion coefficient for investors. The explanation BE offers is that there exist certain imperfections in the economic model of risk aversion, which are being corrected in the more extended models developed by behavioral economists. The Prospect Theory is again an example of such theories. It can be applied to the equity premium puzzle, or to other situations on the stock market inconsistent with the predictions made by SEM like the excess returns puzzle, or the PPP puzzle.

Finally the last, but probably the most general and vast topic in BE is Heuristics. Heuristics refers to strategies which are based on readily accessible information, but which is loosely applicable. It analyzes situations when people make their decisions relying on their intuitive judgments and not on their rationality. This happens very often, especially when people face

¹The invariance principle says that different formulations of the same problem should yield the same preferences and that these preferences should not depend in any way on the method of description of options or on the method of elicitation.

² Prospect Theory introduces a value function (function which assigns values to outcomes), which is s-shaped and asymmetric. This asymmetry implies that even when the variation in the absolute values of the outcomes is equal, the impact of losses is bigger than the one of gains.

some complex problems or incomplete information. They act according to the so called “rule of thumb”, rather than strict logic. Bounded rationality has to be mentioned here as well since it is a crucial notion for this subject matter.

BE is closely linked to cognitive psychology. Most explanations to the shortcomings of SEM, provided by BE, are based on one of the main assumptions of cognitive psychology. It is the assumption that people are not completely rational, as neoclassicists assert, but that people’s rationality is bounded. The term of bounded rationality was first introduced by the winner of the Nobel Prize, H. Simon, in his work “Models of Man: Social and Rational”. This concept is based on the idea that people are only partially rational, and in many cases their decisions are driven by their emotions and subjective points of view, rather than correctly evaluated payoffs. Thus there appear certain issues regarding human behavior, which in no way can be explained and predicted by pure economics. Few of them are presented here.

- People’s decisions and ways of acting have to be in line with their self-expectations. In other words people will often act according to their moral values and their ideas of what they believe to be “right and wrong”, even if it is not utility maximizing. Some persons could argue this, saying that nowadays all people are self-interested and would never do anything which does not bring them any gains, that the concepts of values, of right and wrong, is old and nobody cares about any of these. But if this would be the case, how could be explained the act of donation? Of course some people and organizations do it in order to build themselves a good reputation, which can also be considered as being utility maximizing behavior. However there exist anonymous donations and quite few people chose to participate in them, rather than in the open ones. This act of anonymous donations is nothing else but a manifestation of altruism and altruism is one of the main deviations from rational human behavior which still cannot be explained by SEM. The only reasoned justification to such “irrationality” is that people believe that doing good to others is “right” and they choose to behave the “right” way. Of course acting in harmony with one’s self expectations and values can also be considered in some way utility maximizing since it gives certain psychological comfort and satisfaction, but this is the kind of utility

neoclassical economists do not take account of. All these lead us to new, interesting questions like: What is the right measure of utility? What kind of utility should be used to make better predictions for people's decisions?³

- People are not good at calculating probabilities. They frequently tend to overestimate probabilities of some unlikely to happen events, while the probabilities of more usual events are rather underestimated. For example a plane crash versus a car crash: the last one according to statistical data is much more likely to happen than the first one; nevertheless most people consider plane trips to be much riskier than car trips.
- Humans make mistakes when it comes to estimating the real value of assets they own. In general people, wanting to sell an object they possess, will overprice that object. In BE this phenomenon is called the Endowment Effect.⁴
- Finally people are in general not very good at calculations of their payoffs. When they have to evaluate the ultimate outcomes of different possible behavior strategies, taking into account more than one factor influencing the final result, people make mistakes in appraising them. They often choose the wrong behavior strategy (i.e. behavior strategy which does not maximize their ultimate utility). Money Illusion would be a perfect example in this case. It embodies the idea that people tend to think about money in nominal terms rather than in the real ones. They most often calculate their payoffs in accordance with the face value of money they get and not with their real purchasing power. Shafir, Diamond, and Tversky demonstrated in one of their researches, in 1997, that people miss-calculate their actual payoffs due to the inflation effects, of which they are unable to fully take account.

Neoclassical economists and all their models do not pay any attention to these aspects of human behavior. They keep asserting that people are rational and that psychology cannot prove the invalidity of it through some doubtful and ambiguous experiments. Wilkinson (2008) in his *Introduction to Behavioral Economics* enumerates quite few reasons for such resistance from neoclassicists in accepting the psychological approach to economics used by behaviorists. He says that one of the main subject matters for this criticism is the use of

³ For BE these questions are far from being new. There have been conducted countless researches and studies in BE in the attempt to find the most appropriate measure of utility.

⁴Endowment Effect assumes that utility is not independent of possession and that people who acquired a good in some way tend to value it higher than the ones who do not possess this good.

“wrong” methods in elicitation of results by behavioral economists. Neoclassical economists view the experimental observations and survey responses used in BE, as generators of false results. They state that the lack of real financial incentives in experiments (behaviorists do not provide them, thinking that they might distort the results) makes it impossible to ensure that subjects will behave in the same manner as in the real world, and that they will invest enough attention to the demands of experiments. Also the use of deception by behaviorists in their surveys has received many critiques. It becomes common knowledge that such techniques are being used and this affects people’s behavior. People therefore become more cynical, and eventually their replies do not reflect the reality. The lack of control is another problem which serves as a reason to disapprove of behaviorists. It leads to misinterpretations of results and confounding of effects, thus making it undesirable to fully rely on the conclusions provided by most studies conducted in BE.

In defense of BE, it is necessary to point out that real world data have taken a more prominent position in BE. Surveys and experiments are not the only tools used by behavioral economists anymore. For example functional magnetic resonance imaging (fMRI) allows today to determine which brain areas are active during economic decision making. Experiments simulating markets such as stock trading and auctions can isolate the effect of a particular bias upon behavior. This kind of experiments narrows the range of plausible explanations of human behavior and helps making more accurate predictions about it. Of course this is far from being enough for economic theories to be proved faulty. Gul and Pesendorfer said the following, regarding the approach of Camerer and Loewenstein (2005): “the argument that the evidence from brain science can falsify economic theories is... absurd”. Nevertheless this is not what behaviorists tried to achieve. They do not try to prove that evidences from brain research can falsify economic theories. They assert that economical theories are falsified on their own, by empirical studies involving revealed preference. And this is the point where BE and brain studies become useful, since they divulge “why the economic theories are falsified”. (Wilkinson 2008)

On the other hand the approach suggested by BE does not imply a total rejection of the neoclassical approach to economics, based on utility maximization, equilibrium and efficiency. Neoclassical approach still remains useful and needed, because it offers a good

framework to economists, which can be applied to almost all forms of economical behavior even if it makes refutable predictions (C.F. Camerer, G. Loewenstein, and M. Rabin 2004). The central theme for Behavioral Economics still remains the model of the rational economic man. Most of behavioral economists, unlike psychologists, view heuristic decision making as interesting worth the attention, yet only as consistent exceptions to rationality. Thus in no case should it be considered that BEM is a rejection of the SEM, it rather completes it! It gives answers to the questions that SEM either cannot respond, or responds in the wrong way.

2.2. Tversky and Griffin's and the Choice Judgment Discrepancy

The question regarding the appropriate ways of measuring utility and the differences between people's judgments/feelings and their revealed choices has been studied by many scientists including Argyle (1987), Diener (1984), March (1978), Schelling (1984), and of course Tversky and Griffin.

This section presents a study conducted by Tversky and Griffin, which explores the choice-judgments discrepancy, and which served as an example and a benchmark for the current thesis.

The authors decided to research this topic in more depth, since they believed that the distinction between judgment and choice had not received the due attention in the existing literature of those days. They asserted that most literature before them, introduced the two notions as being generally the same and generating the same results in the end. T&G disagreed with this point of view saying that "In many situations experienced values, as expressed in self-rating, appear to diverge from decision values, as inferred from choice" (A. Tversky and D. Kahneman 2000). They considered that the different results could appear due to the fact that judgment and choice highlight different aspects of the problem. This way when people are asked to determine the level of satisfaction some future events would bring them, they try to imagine what it would feel like to experience those events, but when they have to choose among those events they try to find arguments to justify their choice. Thus the two different mechanisms could often lead to different outcomes.

In order for their assessments to be proven, T&G conducted a survey with 66 respondents, all undergraduate students. The students were provided with the following information:

“Imagine that you have just completed a graduate degree in Communications and you are considering one-year jobs at two different magazines.

(A) At Magazine A, you are offered a job paying \$35, 000. However, the other workers who have the same training and experience as you do are making \$38,000.

(B) At Magazine B, you are offered a job paying \$33, 000. However, the other workers who have the same training and experience as you do are making \$30,000.”

Half of respondents had to answer the question “Which job would you choose to take?”, while the other half would answer a different question: “At which job would you be happier?”. The authors expected for the salary to determine people’s choice, while the comparison with their peers’ salary to loom larger in judgments, which would provide evidence for the discrepancy between peoples judgments and feelings, and their actual choices.

Their predictions turned out to be true: twenty-eight out of thirty-two students (84%), who were asked the first question, preferred the option which offered the higher absolute salary and a lower position, while twenty-one out of thirty-four students (62%), who were asked the second question, said that they would be more satisfied with the option offering a lower absolute salary, but a higher relative position.

T&G came to the conclusion that judgments and choice do often yield systematically different orderings. Choices in most cases seem to be sensitive to payoffs, which reflects the endowment effect, while judgments to comparison or, as they refer to it, to contrast.

The study is relevant because the divergence between judgment and choice can raise an interesting question: “which is the correct or more appropriate measure of well-being?”. In answering this question authors do not give full preference to any of the two; instead they say that both of them provide relevant data for assessment of well-being, yet none of them being entirely satisfactory. They argue that both methods are biased in opposite directions and thus conclude that a compromise between the two methods seems to be most reasonable.

2.3. Fairness in Economics and Inequity Aversion

Just like it is often convenient to ignore frictions in elementary mechanics, in economics it is often handy to consider economic behavior of agents as being constraint only to their budgets and legal regulation. Nevertheless field data often show that there exist some additional constraints to people's behavior, some constraints that the classical models of the profit-seeking agents do not incorporate. Many researchers have used the term of fairness or preference for fairness to denote these additional constraints.

The absence of considerations for fairness is one of the most prominent contrasts that economics contains compared to other social sciences and to the fundamental intuitions about human behavior. Actions in countless spheres conform to the standards of decency and fairness, which are often even more restrictive than the legal ones. Still the standard models assign no role to such phenomena like altruism, or inequity aversion, or social conscience. They assume that agents are only law-abiding and not fair. This could be true for some people, but certainly not true for everybody. Actually very few people are motivated purely by their own interests and these people are usually very unlikely to achieve their final goals because such behavior sets others against themselves. Thus even the most selfish and self-interested person has to take into consideration the effect of his/her behavior on others.

Researches in diverse areas provide noteworthy evidence of the fact that in all societies there is a percentage of population that does care about social goals besides their own material, self-interested goals. In different societies this percentage is different and it depends on many factors (e.g. culture, demographic structure, etc.). We could ignore the existence of this fraction if it was relatively small and insignificant, yet empirical findings (Kahneman, Knetsch, and Thaler (1986); Blinder and Choi (1990); Campbell and Kamlani (1997); Camerer and Thaler (1995)) show that the fraction of people who are driven in their behavior by fairness motives is considerable in most societies. Still these studies draw their conclusions from surveys and questionnaires – doubtful methods according to economists, which can easily lead to incorrect results and suggestions. This would be the situation until the beginning of this century, when the existence of nonmaterial benefits and costs was only speculative and it was impossible to prove that people have reasons to behave according to certain norms of fairness. Today though, with the development of neuroeconomics, with the

appearance of complex neural scanning, the detection, as well as the measurement, of psychological costs and benefits became possible. Thus there emerged factual evidence that a “fair” behavior adds to the utility of an individual by increasing his/her nonmaterial benefits, while a behavior judged as being “unfair” could be source of additional psychological costs which would lead to a decrease in his/her overall utility.

Here are few examples where SEM, due to the lack of additional assumptions about people’s preferences for fairness, seems to be helpless in making the right predictions:

- Giving to charity;
- Participation in unions and protest movements;
- Tipping waiters in a restaurant where one does not intend to go again;
- Volunteering;
- Firms which have a certain monopole, but do not rise prices even during shortages;
- Punishing incorrect behavior towards others even if it is costly for the subject;

There are many other situations which demonstrate the uncompetitiveness of SEM, but still there remain important reasons for it to be used. The most important one is that the pure self-interested models represent simplified situations and thus they are easy in application. Parsimony⁵ is one of greatest virtues of SEM.

2.3.1. Inequity aversion or Inequality aversion?

One of the most discussed subjects in the debates about fairness is the inequity aversion. The phenomenon of inequity aversion is observed when people are eager to give up on a part of their benefits in order to move to more equitable outcomes. Thus: “an individual is inequity averse if it dislikes outcomes that are perceived as inequitable” (C.F. Camerer, G. Lowenstein and M. Rabin, 2004).

One of examples of inequity aversion is when the relative material payoffs affect people’s well-being and consequently their behavior. Thompson, Lowenstein and Bazerman

⁵ Parsimony is one of the four main criteria in evaluating theories. It says that in order for a theory to be considered good it should be constructed on a minimal possible number of assumptions.

“Scientists attempt to abstract the information into the form that is the simplest and aesthetically most pleasing – the combination called elegance – while yielding the largest amount of information with the least amount of effort” E.O. Wilson (1998).

conducted a study in 1989 which showed that the relative payoffs can be crucial in determining some people's decisions. They made a survey, where the respondents were asked to rank different options which had different distributions of outcomes between the subjects and a hypothetical comparison person. Their findings presented the following picture: the utility function was increasing steeply and it was convex for disadvantageous inequality and it was weakly declining and again convex for the advantageous inequality. In nonmathematical terms this would mean that people have a very strong aversion against disadvantageous inequality (respondents ranked the options where their payoffs would be lower than the one of the comparison person much lower than the option with equal material payoffs), and a lower level of aversion against advantageous inequality.

The change from the term of "inequity" to the one of "inequality" is not accidental here. This thesis adopts the point of view of N. Wilkinson who believes that "inequity" is a term which refers to values and norms as it involves the subjective notion of fairness, while "inequality" is rather neutral and it does not imply any value judgment. In this study inequity aversion will relate to the level of aversion among people concerning an inequality between their payoffs and the payoffs of others. So we rather need here a term which would be closer to the idea of equal outcomes, and that is inequality aversion, not inequity aversion (the last one is much broader and can be applied to a much larger amount of situations). Therefore throughout this study we will say that people are inequality averse if they show preference for the options offering equal payoffs to everybody and distaste for the ones containing advantageous or disadvantageous inequalities in payoffs.

Chapter 3

3. The Research Methodology, Design and Hypothesis

3.1. Survey Methodology

The methodology used in the present thesis is the survey methodology; one of the most commonly used methods in BE. “A survey is a systematic method for gathering information from (a sample of) entities for the purpose of constructing quantitative descriptors of the attributes of the larger population of which the entities are members. The word “systematic” is deliberate and meaningfully distinguishes surveys from other ways of gathering information” (R.M. Groves, F.J. Fowler, M.P. Couper, J.M. Lepkowski, E. Singer, and R. Tourangeau, 2009).

The quantitative descriptors are nothing else but statistics. There exist “descriptive statistics” and “analytic statistics”. The descriptive statistics illustrate the size and distributions of various attributes in a population, while the analytical statistics are the data describing how two or more variables are related. The present research has the target of gathering both descriptive and analytical statistics. The descriptive statistics will depict the existence and the magnitude of the discrepancy between judgment and choice, while the analytical statistics will give us an idea about the correlation between such variables as people’s incomes, their age, education and their level of inequity aversion.

The biggest advantage of surveys is that they offer the possibility to measure subjective states, thus the characteristics which cannot be observed on normal basis, since they are internalized within a person. Yet surveys should not be confounded with any experimental techniques. Experiments are usually conducted in special created conditions (e.g. in laboratories). Due to this fact there is sometimes a risk that the results obtained from an experiment will not reflect the reality because the reality could be different under the real world conditions than under the well controlled laboratory settings. A survey though is a non-experimental technique and its scope is to gather information about the real life phenomena, and not the phenomena which exist only in specially created states. On the other hand experiments have their advantages: they usually provide incentives to their study subjects, by this insuring higher interest of respondents to provide more accurate answers,

also their results are clearer and easier to interpret; thus it is better to decide for each separate research topic which methodology is more appropriate. For example if there is a high chance for the results obtained in laboratory settings not to reflect reality than it could be better to consider the survey methodology instead of the experimental one, or vice versa, if the chances of such occurrence are low, than due to advantages of experiments it would be better to stick to the experimental methodology. For the present research the probability of results distortion in an experimental setting are low, yet because of logistic reasons the survey methodology had to be preferred.

One of the most important things, when using the survey method in a study, is for the questionnaires to have a simple and clear wording. The questions should be concise yet comprehensible to the respondents and provide the researcher with the information he/she aimed to obtain. Thus the questionnaires compiled for this research were well thought over and there was made a big effort for the wording to be as simple as possible but still precise and to the point. There were made few previous versions which were piloted to random people who were asked later if there was anything that was not very clear to them and if so what it was. This was done for the author to understand what could create confusion among respondents and modify the final version in order to avoid situations when people provide answers which do not reflect the reality simply because they did not understand the question.

There was used a door-to-door approach, meaning that the author herself got in contact with respondents and asked them to complete the surveys. The door-to-door approach is considered to be the most costly one, in terms of time and money. Yet it was expected for this approach to provide a higher response rate. Another reason to use this approach is that in case there arise any kind of difficulties or misunderstandings for respondents, they can be cleared at that same moment in that same place. In other words if the respondent does not fully understand a question he can get the explanations on the spot. This is beneficial for the research since it lowers the probability of getting false answers just because the respondent understood the question incorrectly.

There was not used any financial rewards for the respondents. The reason is that after having studied more literature on the subject I did not get convinced that there was found significant proof of people paying more attention to the answers they provide and trying to be more

objective when there is financial reward included after the completion of the questionnaires or before.

The questionnaires were translated into Romanian and into Russian (the two spoken languages in the Republic of Moldova) to make it easier and less time consuming for the respondents to fill them in.

3.2. The Between Subject Design

The design utilized in this research is the Between Subjects design. In a Between Subjects design each participant joins one and only one group. The results from each group are then compared to each other to examine differences. For example, in a study examining the effect of Bayer aspirin versus Tylenol on headaches, there will be two groups (those getting Bayer and those getting Tylenol). Participants will get either Bayer or Tylenol, but they do not get both. Same applies to the present study: a group of respondents will be asked “Which job would you choose to take?”, while the other group will be asked “At which job would you be happier?”, but none of them will be asked both questions.

This type of design is different from the Within Subject design, in which the same group serves in the treatment repeatedly. In this case all respondents should be asked both questions: which job they would choose to take and which job they believe would make them most happy. This would certainly give more statistical power to the final results, since the number of observations would double, but there exist significant arguments why the Between Subject design was chosen over the Within. The first and main reason is that due to the similarity of questions there is a chance for people to get confused when being given both questions and give a biased feedback. The source of the biased feedback could be that respondents, in their attempt to look rational and logical, would reply that the option of job they would choose to take is the same one which would make them most happy. Such an outcome might not reflect the reality, but would rather be a manifestation of the fear of deception, mentioned in Chapter 2. People could believe there should be a ”trick” related to the questions and in order to avoid looking foolish in the end, they would try to answer as “rational” and ”reasonable” as possible even if it is in the detriment of their answers’ truthfulness. Also if there are included both questions, the questionnaires would become too long and respondents could get bored and not pay attention to their answers by the end. Or

some of them could even refuse to complete it, being convinced that it would take too much of their time. The last but not the least advantage of the Between Subject design, which played a great role in choosing the questionnaires' design, is that the Between Subject designed questionnaires avoid the carryover effects.⁶

3.3. The Sample and the Survey

The researched sample comprised three hundred random people who live in the capital of the Republic of Moldova, Chisinau. It was made sure that both groups of respondents (the ones who provided answers to the questionnaires reflecting choice and the ones who answered the questionnaires which reflected judgment) had an equal distribution of respondents in three different age groups (100 respondents between 17 and 35 years, 100- between 36 and 55, and the last 100 older than 55 years) and that all of them had different levels of income. Also there was made an attempt to have a more or less equal distribution according to gender. This was done in order to exclude any excessive influence of the three factors on results because this could misrepresent the final picture and lead to erroneous conclusions in the end. Table 1 on the next page offers an overview of the summary statistics of all measured variables for choice and judgment datasets separately.

In order to avoid any framing effects it was decided to create two supplementary versions of surveys. These versions provide with the same information as the first two; the only difference is in the order of cases from the first question (Case 4 switches place with Case 1 and Case 3 with Case 2). Thus if in the first two surveys the differences of wages offered in

⁶ In the Within Subjects design there is a possibility of carryover effects. This is due to the fact that subjects perform in more than one experiment (in our case: if they were asked both questions). It gives the possibility for a carryover effect to be "carried over" from one experimental condition to the second one. In order for the idea of such effects to be better understood there is an example given below.

E.g.: *Subjects are being given two lists of words and asked to recall as many words as they can. The words in the first list are being shown one per second, while the words in the second list two per second.*

The question is whether having participated in the first condition affects the performance in the second one? Maybe having learned the first list made it easier to learn the second one (memory training), or the other way around: it might get difficult for the participants to remember which word belonged to which of the two lists. In either case this would be a representation of a carryover effect since participation in the first experiment could affect the outcomes of the second one.

Same happens in our case: when incorporating both questions in one questionnaire respondents might think that if they selected certain options of jobs which they believe to make them most happy, in order to be coherent they should select the same jobs as being the ones they would choose to take. This would be a result of the carryover effects, because the answers to the second question would be influenced by the answers given before to the first question. These effects could also lead to results which do not reflect the reality by generators of wrong conclusions eventually.

option (a) and (b) gradually decrease, in the two supplementary surveys these differences increase. This step should add objectivity and trustworthiness to the final results as it excludes any possible effects of framing discussed in the second chapter

Table 1 Summary statistics of measure variables

| Var. name | Age | Gender | Education | Income (proxies) | | | |
|-----------|------------|---------|------------|------------------|---------|---------|---------|
| Var. type | Age | Fem | Stud | Trans_1 | Trans_2 | Trans_3 | Trans_4 |
| | Continuous | Dummy | Continuous | Dummy | Dummy | Dummy | Dummy |
| Choice | | | | | | | |
| Mean | 45.1930 | 0.50667 | 15.120 | 0.37333 | 0.13333 | 0.31333 | 0.1800 |
| Median | 43.5000 | 1.0000 | 15.000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Minimum | 20.0000 | 0.00000 | 11.000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Maximum | 83.0000 | 1.0000 | 20.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Std. Dev. | 16.6810 | 0.50163 | 2.9875 | 0.48531 | 0.34107 | 0.46540 | 0.38547 |
| Judgment | | | | | | | |
| Mean | 43.9800 | 0.4800 | 14.6000 | 0.4800 | 0.15333 | 0.25333 | 0.11333 |
| Median | 41.5000 | 0.0000 | 15.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Minimum | 17.0000 | 0.0000 | 11.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Maximum | 82.0000 | 1.0000 | 20.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Std. Dev. | 16.9620 | 0.50127 | 2.8189 | 0.50127 | 0.36152 | 0.43638 | 0.31806 |

3.4.

The Questionnaires

3.4.1. First type of questionnaire

Imagine you are unemployed and looking for a job. You get 3 very similar job offers, but with different wage profiles (wages are set in monthly terms). Which job would you chose to take?

Please rank options in each case this way: 1-would be most happy, 2-less happy, and 3-least happy.

Table 2 Salary Options I

| Options | The salary You get | The salary other employees, with same experience and training, get | Rating (from 1 to 3) |
|-----------------|--------------------|--|----------------------|
| Case (1) | | | |
| a) | 2 500 lei | 2 800 lei | |
| b) | 2 300 lei | 2 000 lei | |
| c) | 2 300 lei | 2 300 lei | |
| Case (2) | | | |
| a) | 2 500 lei | 2 800 lei | |
| b) | 2 350 lei | 2 000 lei | |
| c) | 2 300 lei | 2 300 lei | |
| Case (3) | | | |
| a) | 2 500 lei | 2 800 lei | |
| b) | 2 400 lei | 2 000 lei | |
| c) | 2 300 lei | 2 300 lei | |
| Case (4) | | | |
| a) | 2 500 lei | 2 800 lei | |
| b) | 2 450 lei | 2 000 lei | |
| c) | 2 300 lei | 2 300 lei | |

- 2) **Please indicate your gender below**
- a) Female
 - b) Male
- 3) **How old are you?**
- 4) **Which is your educational background?**
- a) None
 - b) High School Diploma/GED (± 11 years)
 - c) Technical Diploma (± 12 years)
 - d) Associate's Degree/College Diploma (± 13 years)
 - e) Non-Degree Program (± 14 years)
 - f) Bachelor's Degree (± 16 years)
 - g) Master's Degree (± 18 years)
 - h) Doctorate Degree (over 19 years)
- 5) **Which means of transport do you use to get everyday to work?**
- a) By foot
 - b) Public transport
 - c) Taxi
 - d) Own car
 - e) employer-provided car (with a personal driver)

THANK YOU FOR YOU TIME!

Table 3 Salary Options II

| Options | The salary You get | The salary other employees, with same experience and training, get | Rating (from 1 to 3) |
|-----------------|--------------------|--|----------------------|
| Case (1) | | | |
| a) | 2 500 lei | 2 800 lei | |
| b) | 2 450 lei | 2 000 lei | |
| c) | 2 300 lei | 2 300 lei | |
| Case (2) | | | |
| a) | 2 500 lei | 2 800 lei | |
| b) | 2 400 lei | 2 000 lei | |
| c) | 2 300 lei | 2 300 lei | |
| Case (3) | | | |
| a) | 2 500 lei | 2 800 lei | |
| b) | 2 350 lei | 2 000 lei | |
| c) | 2 300 lei | 2 300 lei | |
| Case (4) | | | |
| a) | 2 500 lei | 2 800 lei | |
| b) | 2 300 lei | 2 000 lei | |
| c) | 2 300 lei | 2 300 lei | |

As mentioned in the previous section, to exclude any possible bias in results caused by framing effects, half of the first type questionnaires will have the ordering of cases from the first question as presented in the table above, while half of them will have the ordering presented in the Table 3.

3.4.2. Second Type of Questionnaires

The second type of questionnaires has the same design as the first one. Questions number 2, 3, 4 and 5 are exactly the same. The only difference is that the first question will not ask anymore the respondents “Which job would you chose to take?”, but “At which job would you be happier?”. Like with the first type, the second type of questionnaires will also be divided in two and half of the questionnaires will have the ordering of cases as in table 1, while the other half as in table 2.

3.4.3. Explanations to questionnaires

The surveys contain questions about respondents’ education level and about the means of transport they use for traveling to work every day. The last one was included in order to provide some information about respondents’ levels of income. Of course it would have been perfect to ask straight forward respondents about their earnings. Unfortunately it is common knowledge that people show high level of sensitivity towards direct questions regarding their incomes and thus they often choose not to answer them or sometimes provide untruthful answers. Hence in order to obtain as much as possible truthful information on this issue, it was decided for the means of transport to be included as proxy for respondents’ revenues.

But why would there be necessity for information about respondents’ incomes and their education, if there is not a single hypothesis or sub-hypothesis tested, in this thesis, based on such data? The answer is quite simple, yet not obvious and needs some clarifications. In order to make it comprehensible it will be necessary to go deeper into some of the cultural issues related to the population of the Republic of Moldova. This could be crucial when making the final conclusions relying on the obtained results.

Republic of Moldova is a very young country. It emerged after the fall of the Soviet Union in 1991, of which it was part. For many years the situation in the new born state was extremely difficult and it still is. The fall of the centralized economy put a huge challenge in front of the new Moldovan authorities, who had to rebuild everything from scrap. Unfortunately it is

impossible to say that it was handled in the right manner. Thus, according to IMF, Moldova remains one of the poorest countries in Europe in terms of GDP with the poorest population and highest level of corruption, according to the Corruption Perceptions Index for 2010 published by Transparency International.

The very low standards of living gave birth to a strongly sensed division in the country's population views: a part of Moldovans still longs for the communistic times and supports those "values", saying that even if it was not so good, it was better than it is now; while the other part considers communism as being the reason for Moldova's very slow development and thus they condemn everything that is related to it. This division is usually observed among the middle-aged and the older generation, while the younger generation, in the majority of cases, will hold up to the capitalistic views. Except for age this partition is very much related to people's incomes. The revenue of a person is most times the main factor on which depends whether he/she will belong to one group or the other. Those people, who managed to integrate into the new system after the end of the communistic era and have a good financial situation, would usually not share the old communistic values. While the rest who did not manage to do so, will be the ones craving for the times when everything was "stable" and everybody was "equal". Also the education level frequently stands as an important factor determining people's views regarding this matter. It is often observed that the higher is a person's education level, the more he/she tends to favor the non-communistic ideas about social and economic organization and vice versa.⁷

Finally being said that, it is possible now to give a logical and plain answer to the initial question about the relevance of data, provided by the two inquiries regarding people's education level and the transport they use most often. The main idea related to these data is that they could be significant for testing the hypothesis related to inequity aversion: the poorer and the less educated people from the middle-aged and older groups could prove to be more inequity averse than the young generation and the more successful individuals from their own age groups. Therefore if the fraction of the two groups of people over 35, who are

⁷ The whole paragraph relies on the lifetime observations of the author, who is a native inhabitant of the Republic of Moldova. They present the author's intuition and do not rely on any official researches as such. Thus despite the assertive character they should be treated as suppositions which will also be tested further on in this study, rather than unfounded affirmations.

inequity averse proves to be relatively small, it does not mean that the hypothesis is faulty. It rather means that the inequity aversion is a common pattern not for all older people who lived and worked a longer period of time during communism, but only for that part of the people over 35, who did not manage to integrate into the new system.

3.5. The Research Hypothesis

3.5.1. *Tversky and Griffin and the present research*

The present research will partly replicate the work of Tversky and Griffin (2000), thus it will test the presence of discrepancy between judgment and choice among people. Respondents will be given two different types of questionnaires and asked to rate their preferences from one to three in each of the cases presented to them.

In the first set of questionnaires people will be asked which job they would choose to take - this will reveal their choices. It is expected that respondents of first type of questionnaires in the majority of cases will choose option (a) over option (b). Thus the absolute salary is expected to determine people's choices.

In the second set of questionnaires people will be asked to choose options which they believe will make them most happy. This will reflect their judgment. It is expected that here will be a higher percentage of respondents who will choose option (b), thus the one which offers them a lower absolute salary yet a higher relative position, over the option (a), which offers a higher absolute salary and a lower relative position. This was exactly the way T&G proved the existence of discrepancy between judgment and revealed choice and it is the first hypothesis of this thesis.

3.5.2. *Extensions to Tversky's and Griffin's research*

3.5.2.1. Preference Reversals

The first extension to T&G's research is the attempt to capture the turning points when people start choosing option (b) over option (a), despite of the lower salary in option (b). In order to do so, the questionnaires contain four different cases, with different salaries in option (b). The wage in option (b) grows gradually. In each subsequent case there are being added 2% (50 lei) of the salary mentioned in option (a) to the salary offered by option (b), cumulative addition being used. The payment in (a) always remains higher, but the difference

between (a) and (b) steadily becomes smaller. It is expected that at a certain point people will not want to choose the option with the higher absolute salary, even if they did so in the beginning, because the difference between the two amounts will become too small to compensate for the discomfort caused by the lower relative position in that option. These points, where the change in preferences is observed, will be called “preference reversal” points⁸. The existence of such preference reversals would violate the predictions of SEM. According to SEM people are utility maximizers, and their utility is measured according to the material benefits implied in each option. Thus people’s choices should be made in accordance only with the final material payoffs, while the non-material payoffs (like the higher relative position) should not be taken into consideration. People should not change their preferences as long as the salary in option (a) is at least as good as the one in option (b). Finally if it proves that people do make their choices in disagreement with SEM’s predictions, then there appear important questions which would need answers, such as: “Can judgment influence revealed choice? Is it an important part of the decision making process? Could there be made better predictions of human behavior if people’s judgments/attitudes were taken account of? Are the non-material benefits important for the decision making process? Should we incorporate both, the material and non-material, benefits in one measure of utility? If so, how?”.

3.5.2.2. Inequality Aversion Hypothesis

The second extension to T&G’s research is the attempt to test for inequality aversion among respondents. This research will examine the self-centered inequality aversion, when people do not care about the inequality which might exist among other people’s outcomes, but they do care how fair their payoffs are compared to the payoffs others receive.

As shortly mentioned before, it is expected that there could be found a high level of inequality aversion among older respondents. The reason is that they are the ones who have lived for a longer time under the communistic regime and thus could have assimilated other values and standards than the younger generation. More specifically, older people are expected to be more in line with the main ideologies of communism and socialism about equality of condition, equality of opportunity and equality of outcomes, which would lead in

⁸ Preference reversal points here do not have the exact same meaning as the one used in cognitive psychology for preference reversals.

the end to a high rate of inequality averse people among the older generation. In the same time the young generation is the one who reached that period of communism when the negative effects of this regime started to be more and more visible (i.e. when policy of equal payoffs led to liquidation of incentives to work harder, which damaged a lot people's work ethic and of course affected negatively countries' GDPs and instead of reducing poverty it deepened it), thus they are expected to reject all of those communistic values and the percentage of young people who are inequality averse is supposed to be lower.

In order to test this hypothesis, in all questionnaires there was included a third option: option (c). In this option the salary is identical to the one in option (b). The only difference is that unlike option (b), which offers a higher relative position, option (c) offers the same salary to all employees who have the same experience and training, thus the respondents will be in equal positions with their peers.

If the hypothesis is true than a great part of the older generation will choose option (c) over (b), in order to avoid the feeling of guilt caused by the **advantageous** inequality presented in (b), or they might choose (c) over (a) in order to avoid the **disadvantageous** inequality from option (a). If the last case proves to exist, this will indicate towards a very strong inequality aversion, when people are willing to choose the lower payoff only to be equal to the rest of their peers. Or, in other words, people are willing to give up on some of their benefits in order to move to more equitable outcomes. Such an outcome would totally contradict the SEM's predictions, which forecasts that people always behave rational and the only effective constraints are the budgetary and the legal ones. In this light people should always have to choose the option (a) over (b) and (c) since it offers the highest absolute salary and their behavior should not be subject to any additional constraint, like preference for fairness or equity or equality in this case.

3.5.2.2.1. Inequality Aversion or Altruism?

In the previous section it was assumed that if people chose the option offering equal payoffs then they are inequality averse. But what if the main drive for people to incline towards the option with equal outcomes is not the aversion towards inequality? What if it is altruism that determines respondents to choose the more equitable and fair outcomes? After all both, inequality aversion and altruism have to do with preferences for fairness and equity, and here

they could be easily confounded. In this case half of the study would be compromised and the final conclusions would be far from accurate. Thus before testing whether people are inequality averse it has to be proven that it is inequality aversion and not altruism what determines respondents to rank the option with equal salaries higher than the rest of the options.

As a start a more detailed explanation of the term altruism will be necessary. After this it will be possible to determine how an altruistic behavior would manifest in the conditions of the present survey and whether it is altruism or inequality aversion here the main source of deviations from rationality in some people's behavior.

We all know the basic meaning of altruism. We say that somebody is altruistic if he/she behaves in a selfless way and cares about the wellbeing of others. For such people the main motivation is to help the rest and to do good, without expectations of any rewards. This understanding is the most common one and most well know; it is the definition of altruism used in psychology. So the altruism when people care only about increasing the welfare of others without increasing their own welfare (not the material or the psychological) is the psychological altruism, yet it is not the one used in economics. Why is this so? The main problem is that the psychological altruism cannot be incorporated into any utility maximization model, not the neoclassical ones, neither the behavioral ones. If a factor cannot be integrated in some way into the utility function of an individual, then it neither can affect that individual's behavior, consequently no economic model can reflect the influence of such a factor on human behavior.

Economics uses two distinct notions when it comes to altruism:

- I. **Pure altruism** - when the utility of a person grows if the utilities of others grow as well. For example, somebody gets a raise in salary; obviously his/her utility grows because of this. In the same time a third party also feels good because somebody else is happy. This good feeling provoked by the happiness of someone else constitutes the utility for the third party. It is not material utility, it is rather psychological, but it is now a factor which can be incorporated into the utility function and through the utility function into a chosen economic model.

- II. **Impure altruism** – when the utility of a person increases in case of his/her own contribution to others. For example a person feels better because he/she helped someone in need with lending some money, but did not get the same feeling of happiness when someone else helped that same person.

Now having a deeper understanding of the concept of altruism used in economics, we can start thinking and analyzing how a person prone to altruism, and not inequality aversion, would rank the options from the questionnaires.

The salaries of the respondents' peers are fixed in all options and cannot be influenced by the respondents (the respondents cannot choose to give a part of their income to their peers). This means that the impure altruism can be excluded from our analysis and we can examine the expected behavior of a purely altruistic individual only.

According to the explanation above, a purely altruistic person will increase his/her utility when the rest of people will also increase theirs. Now going back to the questionnaires: which option could give the highest utility to an altruist? It is option (a). This option not only provides the highest absolute salary to the respondent (thus in this option the respondent gets the highest material utility) but it also offers the highest salaries to his/her peers. Option (a) therefore, is the one which increases most the utility of the respondents' peers, which in turn makes his/her own utility grow as well (in this case it's the psychological utility from the thought that other people are better off).

Hence it is clear that if it was altruism determining people's decisions, than these people would rank option (a) the highest. This could be the case, and maybe there will be quite a significant fraction of those interviewed who will decide to go for option (a), but this is not what we are interested in. What we will be analyzing for our hypothesis about inequality aversion is the fraction of people who rank option (c) above others and not option (a). So we can say now we proved that it should be inequality aversion responsible for the deviations in human behavior we are intending to examine, and not altruism.

Chapter 4

4. The Survey Results

4.1. First Hypothesis

4.1.1. *Discrepancy between choice and judgment*

According to the first hypothesis people are supposedly more sensitive to higher absolute salary when it comes to choice, while in judgments they are determined more by their position in the company relative to their peers. To test whether this is true, Tversky and Griffin included in their questionnaires the two options: one offering a higher absolute salary and the other a higher relative position, which made their results clear and easy to interpret. In the present survey there was added a third option and people had to rank their preferences taking account of all three options together. This fact could have brought some confusion when it would come to testing the hypothesis. In order to avoid this, it was decided that for testing the first hypothesis only the rankings for the first two options will be taken into consideration. In other words it will be compared only how people rank option (a) in comparison to option (b), while option (c) will be ignored.

The results were as following: 112 (74.67%) people out of 150 who were asked the question “Which job would you choose to take?” gave preference to the option which offered them a higher absolute salary and a lower relative position; only 38 (25.33%) chose the one giving them a higher relative position and the lower salary. In the same time, when asked the question “At which job would you be happier?” 78 people (52%) gave preference to option (b) over (a) and 72 (48%) chose (a) over (b). These numbers differ just a little from the ones obtained by Tversky and Griffin, so we can say that the hypothesis is valid in our case as well. According to our results, people do make their choices based more on material motivations, while in their judgments they are more influenced by the comparison to others.

T&G explain this phenomenon by the fact that there are two different mechanisms which generate judgments and choices and this is why the final outcomes are not the same. Yet there have been other thoughts on this subject as well, for example the one proposed by N. Wilkinson (2008). He suggested that one of the reasons why people choose the higher absolute salary, even if it does not make them happy, is that they know for sure it will make them better off now. On the other hand the feeling of unhappiness provoked by the lower

relative position is only hypothetical; people can only think it possible, but cannot be sure it will happen. Hence there could be elements of risk and uncertainty and inter-temporal choice involved in this kind of decision making process.

4.1.2. Preference Reversals

The next step is analyzing the preference reversal points. Again the ratings are being compared only for the first two options. The shifts in preferences are presented in the table below.

Table 4 preference reversals in numbers and percent

| | Case 1 | Case 2 | Case 3 | Case 4 |
|--|---------|---------|---------|--------|
| Salary difference in option (a) from (b) | 200 Lei | 150 Lei | 100 Lei | 50 Lei |
| Choice | | | | |
| Number | 38 | 3 | 21 | 43 |
| Percent (%) | 25.33% | 2% | 14% | 28.67% |
| Judgment | | | | |
| Number | 78 | 0 | 52 | 8 |
| Percent (%) | 52% | 0% | 34.67% | 5.33% |

Table 4 present very well defined preference reversals once there were certain changes in salary differences from option (a) and (b).⁹ In the case of judgments the preference reversal point is lower than in case of choice. This could be inferred from the fact that the biggest shift, for the people answering the second type of questionnaires, happened in Case 3, while for the ones answering the first type of questionnaires it was in Case 4. It seems to be reasonable if taking into consideration that people are more sensitive to contrasts when it comes to judgment, while when it comes to choice they decide in accordance with their payoffs. So it is logical that in case of choice people will need stronger material incentives to change their decisions than in case of judgment. This incentive is the salary from option (b) and it has to be 2 450 lei for people to start massively changing their choices, while for changes in judgments it is enough for the salary to reach the amount of 2 400 lei.

Having proved the existence of preference reversals makes it possible for us to explore the idea proposed by N. Wilkinson regarding the presence of elements of risk and uncertainty in this specific case of decision making. If Wilkinson is right than there should be involved

⁹ The numbers for the first case are presented in the table just to offer a clearer picture, they do not represent shifts in preferences though.

discount rates in the process of deciding, with which people discount their future outcomes¹⁰, and if so are these rates stable?

DUM assumes that the discount rates do not change for people during their life. Yet Mischel and Metzner (1962) found evidence in their research that it is not quite true. They performed an experimental study on people aged between 19 and 89 and found out that older people discount more than the younger ones, while the middle-aged less than either group. Thus it seems that younger people are more impatient than their parents and less than their grandparents, whose future involves a greater degree of uncertainty. Similar findings were made by Harrison, Lau, and Williams (2002).

The present questionnaires provide answers regarding the respondents' ages, which we can classify into three different categories: 1) young (17-35 years); 2) middle-aged (35-55 years); 3) old (>55 years). Unfortunately it is not possible to directly observe people's discount rates, yet it was possible to determine their preference reversal points. Thus if we follow Mischel and Metzner's findings and consider that the older generation is the one who discounts future outcomes most, than their preference reversal points should be the highest (they will prefer to have the highest absolute salary because it is a certain outcome, and they will care less about the lower relative position, since the unhappiness about being "behind" their peers could happen in the future, but it is not certain). The middle-aged group is supposed to have the lowest preference reversal points, since they discount least and the younger generation should be somewhere in-between.

In order to test for this, there was created a chart showing the age distribution for the preference reversals elicited before. Figure 1, on the next page, does not show any proof that the idea exposed above could be realistic. Only the answers to the first set of questionnaires were examined here.¹¹

¹⁰ Here the future outcomes are represented by the feeling of dissatisfaction cause by the fact that other employees with same experience and training would get a higher payment than the respondent.

¹¹ This was done because they illustrate the revealed choices and because here we are interested to know what people would choose and not what they believe would make them happier, thus it was decided for the questionnaires reflecting judgment to be ignored.

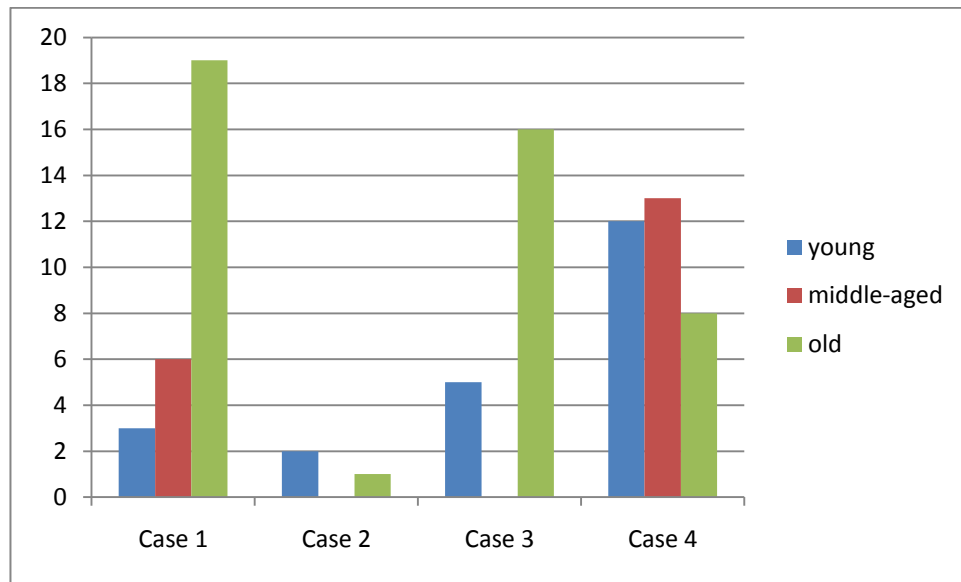


Figure 1 Age distribution for preference reversals (case of revealed choice)

If Wilkinson was right and there exist elements of risk and uncertainty, we'd have to say that, according to the findings of the present research, the older people are the ones who discount the least, the young discount a bit more and the middle-aged discount most. This would go against the earlier findings made by Mischel and Metzner and also against one of DUM's main assumptions according to which the discount rates do not change though out life. On the other hand the idea proposed by Wilkinson cannot be tested in any manner in this research. Thus I would rather refrain from any final conclusion and suggest that it would be better for this issue to be analyzed in a more extensive research and which is focused on the concepts of risk and uncertainty and inter-temporal choice, rather than choice judgment discrepancy and inequity aversion.

There has been observed another very interesting pattern though among the preference reversals we have just found. There is certain regularity in the gender distribution when talking about preference reversals: women seem to be more prone to shifts in preferences; also they appear to start shifting at earlier stages than men do.

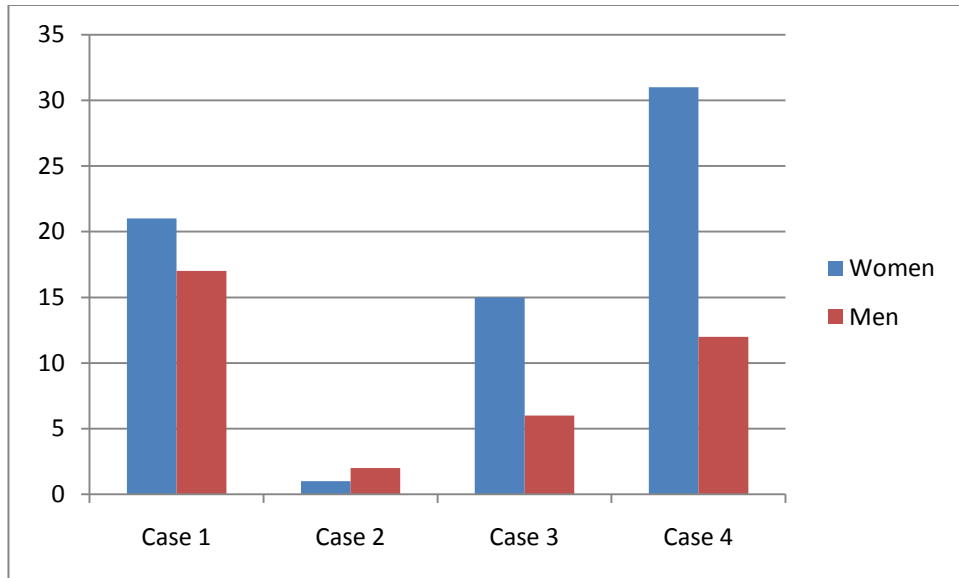


Figure 2 Gender distribution for preference reversals (case of revealed choice)

In the case of choice, out of the 38 people who preferred option (b) over (a) from the very beginning, 21 were women and only 17 were men. In the second case out of the 3 people who changed their preference 2 were men and 1 woman; in case 3: 15 were women and only 6 men. Finally in case 4, out of 43 people who changed their decisions, 31 were women and 12 men. If adding these numbers we see that 68 women out of the total 76, which is 89.5% of all women who answered the questionnaires reflecting choice, rated option (b) higher than option (a) at a certain moment. While for men this number is only 63.9% (46 men out of 72).

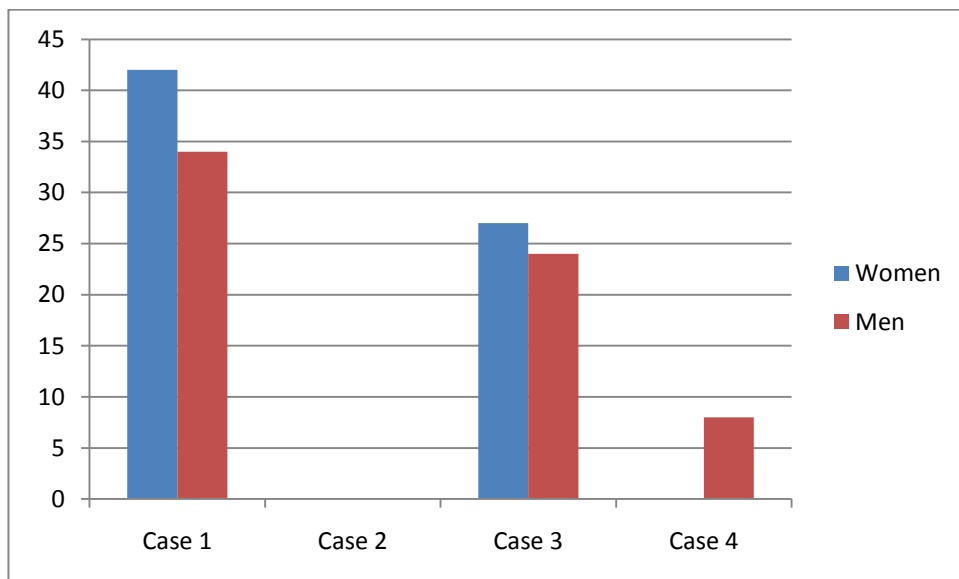


Figure 3 Gender distribution for preference reversals (case of judgment)

For the questionnaires reflecting judgment Figure 3 shows the following results: in the very beginning out of the 78 respondents, who said to be happier with the conditions from option (b) than with the ones from option (a), 42 were women and only 34 were men. In the third case out of 51 people who changed their attitudes 27 were women and 24 men, while in the last case all 8 respondents for whom changes were observed were men. If putting again all numbers together the result disclose a very similar picture as in the case of the first type questionnaires: 71 women out of 73 said to be happier with the option offering a higher relative position and a lower wage; in other words 97.3% of all female respondents behaved “irrationally” from the economic point of view, at a certain moment, some of them from the very beginning, some later when the difference in wages became smaller. For men this percentage is again a bit smaller, 85.7%.

For both types of questionnaires the pictures are quite similar thus the final conclusion reached is that, according to the results of the present research, men seem to be more rational than women (the meaning of rationality here is the one used by economists). Men are more motivated by material payoffs than by some ambiguous benefits like a higher relative position. Women on the other hand seem to be more emotional, less rational and very sensitive to comparison with others.

4.2. Second Hypothesis

4.2.1. The Econometric Model

In order for the second hypothesis to be tested there was created the following econometric model:

$$IA = \beta_1 Age + \beta_2 Fem + \beta_3 Stud + \beta_4 Trans_1 + \beta_5 Trans_2 + \beta_6 Trans_3 + \beta_7 Trans_4 + \varepsilon$$

Description of variables:

IA – the dependent variable; it is a discrete variable as it takes values from 0 to 2; it is ordered since each of its values corresponds to a certain level of inequality aversion among respondents.

IA = 0 – when the respondent is not at all inequality averse;

IA = 1 – when the respondent has an intermediate level inequality aversion;

IA = 2 – for the respondents who are extremely inequality averse;

The values are assigned in accordance with the replies, provided by respondents in their questionnaires, in the following way: if a respondent chooses the third option (the one offering him/her the lower absolute salary, but equal to everybody's salary) as his/her first preference, the variable IA takes the value of 2. This would mean that the respondent is extremely inequality averse. Why? Because despite of a higher absolute salary in the first option and a higher relative position in the second option, the person chooses, as first preference, the third option, which is most disadvantageous from the economic rationality point of view. Or in other words, this person is eager to give up on some benefits, just for everybody to be equal in their outcomes. If the third option is on the second place in the preference list of the respondent (i.e. his first preference is the option which offers the higher absolute salary or the higher relative position), then the respondent is considered to have an intermediate level of inequality aversion, and the dependant variable IA takes the value of 1. Finally if the third option is the respondent's last preference, he/she is considered not to be inequality averse, and the value of IA is 0 in this case.

Age – continuous independent variable; specifies the respondent's age; takes values from 17 to 82;

Fem – dummy variable; indicates respondent's gender; takes the value of 1 or 0 (1 if the respondent is a woman, 0 otherwise);

Stud – continuous independent variable; indicates the total number of years of schooling the respondent possesses; takes values from 11 to 20;

Trans_1, Trans_2, Trans_3, Trans_4 – dummy variables; take values of 1 or 0; indicate the means of transport the respondent uses most often in his/her everyday life. They were included in the regression as proxies for income.

Trans_1 = 1 if the respondent uses most often the public transport, and zero otherwise; should reflect the lowest income level.

Trans_2 = 1 if the respondent uses most often the taxi in his everyday life, and zero otherwise; his/her incomes are considered to be higher than the ones of the previous group.

Trans_3 = 1 if the respondent drives his own car, and zero otherwise; shows that the respondent has higher income than the first two groups, since he/she is able to afford to buy a car.

Trans_4 = 1 if the respondent has a car with a private driver, and zero otherwise; it is assumed that these respondents have the best paid jobs and thus they belong to the group with the highest income level.

The model chosen, to run the regression with, was the Ordered Probit Model in Stata. The main reason for this choice is the discrete and ordered nature of the dependant variable. It was decided for two sets of regressions to be run: first one with data obtained from the first type of questionnaires (the ones reflecting revealed choice) and the second one based on data from the second type of questionnaires (the ones containing the question about happiness, thus reflecting judgment). The logic behind this decision is that people could show different levels of inequality aversion in the two datasets, which could serve as a proof of choice judgment discrepancy among respondents¹².

4.2.2. Estimating IA in the revealed choice questionnaires

4.2.2.1. General estimations with variable Age continuous

From the result generated by Stata, presented in table 1, we can see that only the independent variables Age, Fem, Stud and Trans_1 are statistically significant¹³. Stata omitted the dummy variable Trans_4, because of colinearity and because it is the dummy corresponding to the smallest value of the variable (Stata does this by default). The Chi-square points out that the hypothesis of all the model coefficients to be zero is false. Also the value of Pseudo R-squared indicates that the model fit is a quite good one.

| | |
|----------------------|----------------------------|
| Number of obs = 150 | Log likelihood = -85.82638 |
| LR chi2 (6) = 139.99 | Pseudo R2 = 0.4492 |
| Prob > chi2 = 0.0000 | |

Table 5 Probabilities of outcomes for revealed choice (Age continuous)

| Outcome | Probability |
|---------|-------------|
| IA=0 | 39.29078% |
| IA=1 | 42.82698% |
| IA=2 | 17.88224% |

¹² A more extensive explanation of how different levels of inequity aversion could serve as proof of choice judgment discrepancy is offered on page 58.

¹³ Throughout the research the chosen confidence level, according to which the statistical significance of coefficients is being judged, will be 95%.

Table 6 Ordered probit general estimations for revealed choice (Age continuous)

| Variable | Coeff. | Std. Err. | Z | P> z | [95% Conf. Interval] | Mean of X |
|----------|-----------|-----------|-------|-------|----------------------|-----------|
| Age | 0.04862 | 0.00796 | 6.10 | 0.000 | 0.03301 0.06423 | 45.1933 |
| Fem | -0.64266 | 0.25282 | -2.53 | 0.011 | -1.14014 -0.14519 | 0.50667 |
| Stud | -0.26551 | 0.05965 | -4.45 | 0.000 | -0.38241 -0.14860 | 15.12 |
| Trans_1 | 1.05074 | 0.48004 | 2.19 | 0.029 | 0.10988 1.99159 | 0.37333 |
| Trans_2 | 0.55905 | 0.46436 | 1.20 | 0.220 | -0.35108 1.46919 | 0.13333 |
| Trans_3 | 0.22874 | 0.39395 | 0.58 | 0.561 | -0.54339 1.00087 | 0.31333 |
| Trans_4 | (omitted) | | | | | |
| Cut 1 | -1.87616 | 1.16763 | | | -4.16466 0.41234 | |
| Cut 2 | -0.68455 | 1.16087 | | | -2.95981 1.59071 | |

In order to make the results above more easy to understand and interpret, below there is presented a graph showing the probabilities for estimated ordered probit model. But first, for obtaining the threshold points presented in the scheme, it is necessary to calculate the implied function at average values of variables. Beneath these calculations are being shown in full, as an example, while the rest will be included only in the list of calculations in the attachments of this thesis.

$$\beta X_{av} = 0.04862 * 45.1933 + (-0.64266) * 0.50667 + (-0.26551) * 15.12 + 1.05074 * 0.37333 + 0.55905 * 0.13333 + 0.22874 * 0.31333 = -1.60442$$

$$\text{cut1} - \beta X_{av} = -1.87616 - (-1.60442) = -0.27174$$

$$\text{cut2} - \beta X_{av} = -0.68455 - (-1.60442) = 0.91987$$

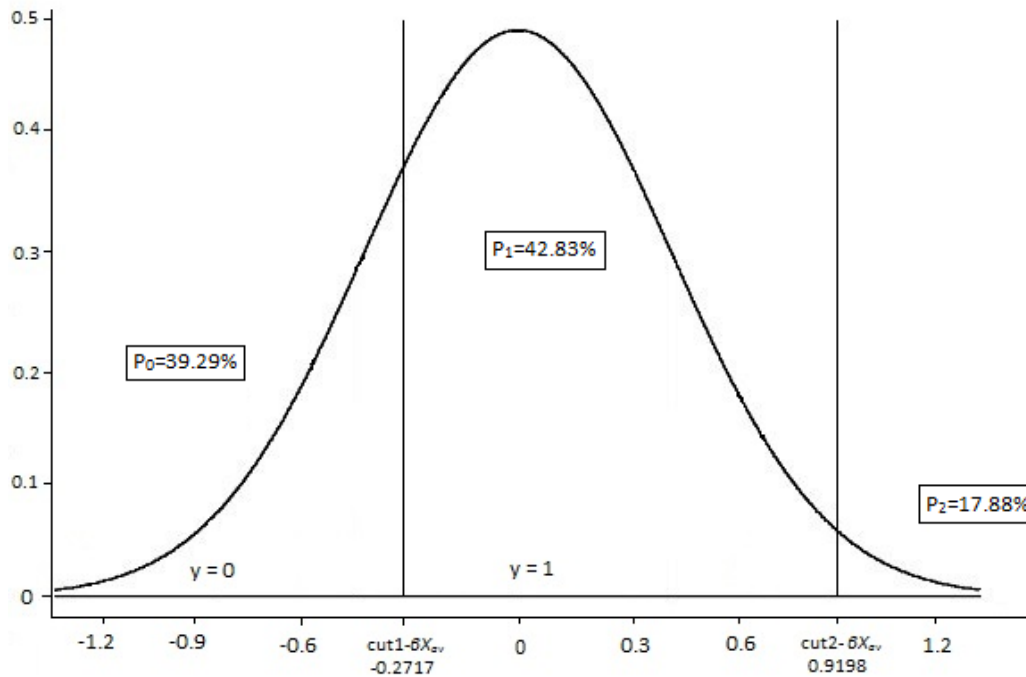


Figure 4 Probabilities of outcomes for revealed choice (Age continuous)

Figure 1 shows the implied probability distribution in the population for people with average characteristics: age - 45.2 years; woman; education level - 15.1 years; who uses the public transport most often, thus has a low level of income. Consequently in a population with individuals who poses the average characteristics, the probability of people to be not at all inequity averse is 39.29%, to be somehow inequity averse - 42.83%, and be extremely inequity averse - 17.88%. These probabilities change though as the characteristics (x) change. In terms of the figure, changes in characteristics will lead to changes in the placement of the partitions in the distribution, hence in the probabilities of the outcomes. If, for example, we take a person with the age of 60 years, not the average one anymore (45.2 years), the function will be calculated again, with the new value for the variable Age. This will induce different values for the threshold points and consequently different probabilities for outcomes.

4.2.2.1.1. Partial effects (Age Continuous)

The interpretation of coefficients obtained through the ordered probit model is more complicated than of those obtained through ordinary regressions. As seen above in order to interpret parameters one should refer to probabilities themselves. Also it is not enough to calculate only the coefficients in the main regression, since they are not really informative. In order to be able to judge correctly the results of the study, it is necessary to calculate the partial effects for each independent variable for each outcome probability. The reason for this is that, to really understand the effect of change in one of the independent variables, all the other variables have to be held fixed, at certain levels of interests (here at their means) while only the our variable of interest fluctuates. Thus the effect of a change in one of the variables depends on all model parameters, the data and also on the probability (cell) of interest.

Table 7 Estimated partial effects for revealed choice (Age continuous)

| Outcome | Effect | Std. Err. | Z | P> z | [95 % Conf. Interval] | |
|-------------------------------|----------|-----------|-------|-------|-----------------------|----------|
| Continuous Variable Age | | | | | | |
| AI = 0 | -0.01869 | 0.00301 | -6.21 | 0.000 | -0.02459 | -0.01279 |
| AI = 1 | 0.00599 | 0.0025 | 2.40 | 0.017 | 0.00109 | 0.01088 |
| AI = 2 | 0.01271 | 0.00249 | 5.09 | 0.000 | 0.00782 | 0.01759 |
| Binary (0/1) Variable Fem | | | | | | |
| AI = 0 | 0.24293 | 0.09352 | 2.60 | 0.009 | 0.05964 | 0.42623 |
| AI = 1 | -0.07482 | 0.04124 | -1.81 | 0.070 | -0.15565 | 0.00601 |
| AI = 2 | -0.16811 | 0.06661 | -2.52 | 0.012 | -0.29868 | -0.03755 |
| Continuous Variable Stud | | | | | | |
| AI = 0 | 0.10208 | 0.02316 | 4.41 | 0.000 | 0.05668 | 0.14748 |
| AI = 1 | -0.0327 | 0.01499 | -2.18 | 0.029 | -0.06207 | -0.00333 |
| AI = 2 | -0.06938 | 0.01687 | -4.11 | 0.000 | -0.10245 | -0.03631 |
| Binary (0/1) Variable Trans_1 | | | | | | |
| AI = 0 | -0.37183 | 0.14917 | -2.49 | 0.013 | -0.66421 | -0.07946 |
| AI = 1 | 0.06968 | 0.04402 | 1.58 | 0.113 | -0.0166 | 0.15596 |
| AI = 2 | 0.30215 | 0.14773 | 2.05 | 0.041 | 0.01261 | 0.59169 |
| Binary (0/1) Variable Trans_2 | | | | | | |
| AI = 0 | -0.19709 | 0.14601 | -1.35 | 0.177 | -0.48325 | 0.08908 |
| AI = 1 | 0.02545 | 0.02895 | 0.88 | 0.379 | -0.03129 | 0.08218 |
| AI = 2 | 0.17164 | 0.16024 | 1.07 | 0.284 | -0.14243 | 0.48571 |
| Binary (0/1) Variable Trans_3 | | | | | | |
| AI = 0 | -0.08668 | 0.14706 | -0.59 | 0.556 | -0.37492 | 0.20156 |
| AI = 1 | 0.0246 | 0.03814 | 0.64 | 0.519 | -0.05016 | 0.09936 |
| AI = 2 | 0.06208 | 0.11064 | 0.56 | 0.575 | -0.15478 | 0.27894 |

In Table 5 there are presented all the partial effects for each independent variable in each cell of interest. These partial effects give the impacts on the specific probabilities per unit change in the regressor. Below I will refer only to the effects of the statistically significant variables: Age, Fem, Stud and Trans_1.

Continuous variable Age: the change of one year, in the variable age, will decrease the probability of the respondent not to be inequity averse by 1.86924%; in the same time it will increase the probability of this respondent to have an intermediate level of inequity aversion by 0.59878% and also increase the probability of being extremely inequity averse by 1.27046%.

The changes in the probability models are usually marginal (small), thus, for illustrating the effect of Age in a graph, I will consider a bigger change (from the person with an average age of 45.2 years to a person who is 50 years old, an increase of 4.8 years) so that the modifications in the probabilities are visible in the figure.

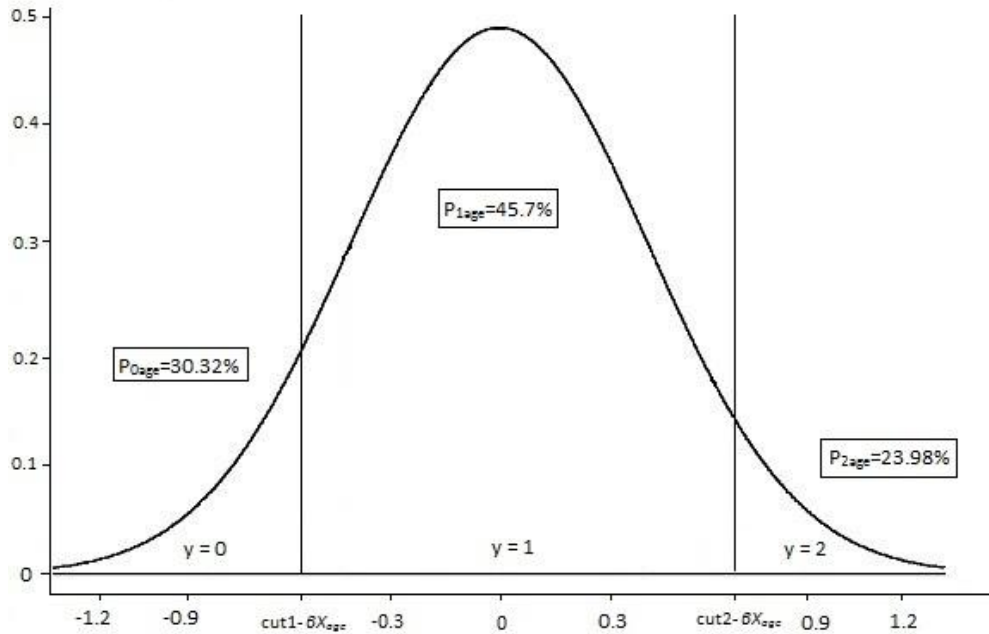


Figure 5 Probabilities with change in variable Age (for choice)

Figure 2 shows the effect of additional 4.8 years in a person’s age. Thus the person for whom the graph was constructed above will be 50 years old instead of the average of 45.2 used in the Figure 1. There is noticed a change in all three probabilities: the two at the right end of the distribution have increased, while the one at the left end decreased. Hence a 50 year old person with all other characteristics held at their mean values, has a 30.31% chance to be not inequality averse, 45.7% to be somehow inequality averse, and 23.98% chance to be extremely inequality averse.

Dummy variable Fem: according to the results in Table 5 women seem to be less inequality averse than men. When the value of the variable Fem is 1 the probability of the respondent to exhibit no inequality aversion rises by 24.2933%. This result is quite stunning. Also the probability of a female respondent to be somehow inequality averse and extremely inequality averse decreases by 7.48199% and 16.81131% respectively.

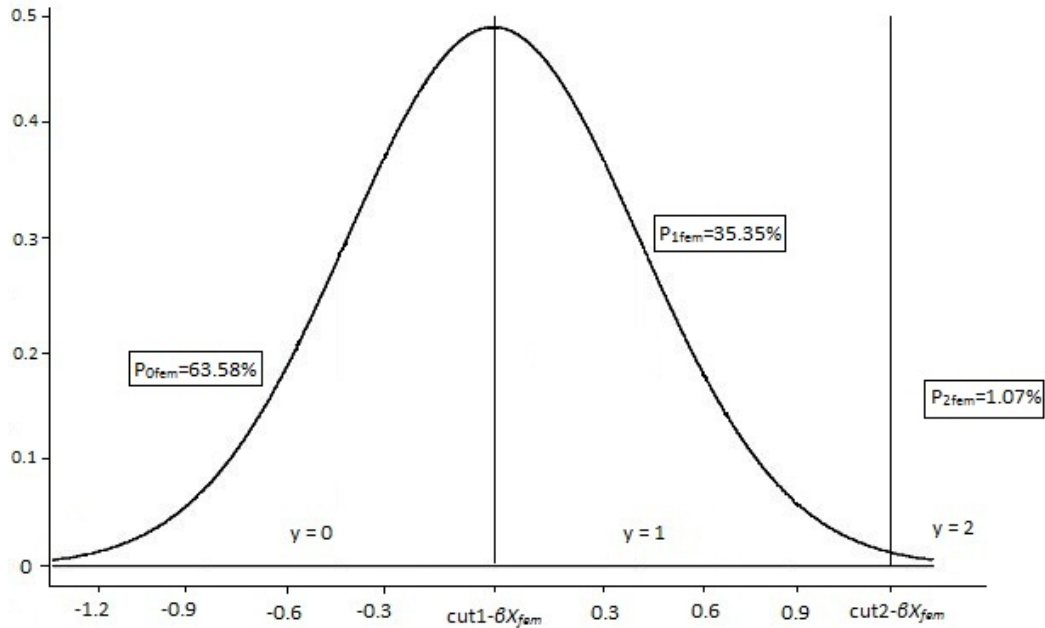


Figure 6 Probabilities with change in variable Fem (for choice)

Continuous variable Stud: An additional year of studies decreases the probability of a person to be extremely inequality averse by 6.93821%. Also the probability of having an intermediate level of inequality aversion will decrease by 3.27001% and logically the probability of not being inequality averse at all will increase, here by 10.20822%.

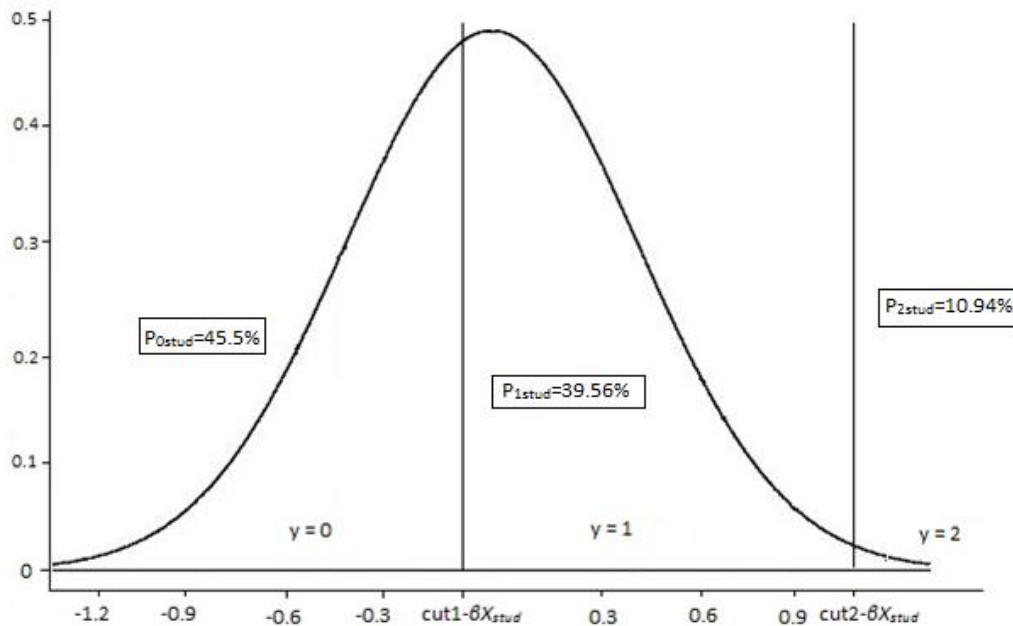


Figure 7 Probabilities with change in variable Stud (for choice)

Dummy variable Trans_1: From the table of partial effects one can see that when the variable Trans_1 takes value of 1, the probability of the respondent not to be inequality averse decreases by 8.66812% and in the same time the probabilities of being somehow inequality averse and extremely inequality averse rise by 2.46011% and 6.20801% respectively. As mentioned before the four dummies indicating the means of transport used by respondents are included in the regression as proxies for income. The variable Trans_1 indicates the lowest level of income. So, in other words, the low level of income of the respondent increases his chances to be inequality averse by the numbers shown above and decreases his probability of not being inequality averse by 8.66% approximately.

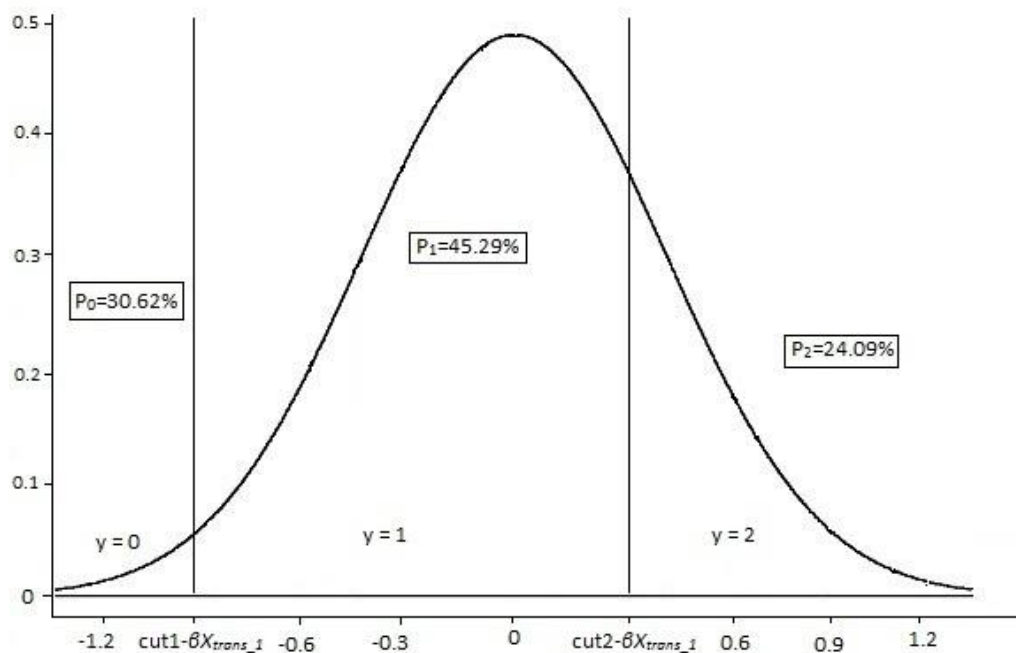


Figure 8 Probabilities with change in variable Trans_1 (for choice)

4.2.2.2. Testing for dependency between variable Age and variable Stud

In order to judge better the results obtained above there is need to test whether there is any dependency between the age of the respondent and his/her level of education. If these variables are interdependent then the effects of them both should be bigger than the ones obtained in the regression above. The easiest way to test for this is to run a regression of the variable Stud on the variable Age.

Number of obs = 150
 F(1, 148) = 9.45
 Prob > F = 0.0025

R-squared = 0.0600
 Adj R-squared = 0.0537
 Root MSE = 2.9062

Table 8 Estimated OLS Age/Stud, for revealed choice

| Stud | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] |
|--------|----------|-----------|-------|-------|----------------------|
| Age | -0.04388 | 0.01427 | -3.07 | 0.003 | -0.07209 -0.01568 |
| _const | 17.10325 | 0.68729 | 24.89 | 0.000 | 15.74509 18.46141 |

The estimations above show that the coefficient for the variable Age is negative which means that each additional year in the respondent's age will lead to less education. The expected dependence would be the reverse one, that age would have a positive influence on education, because the very young people (let's say the ones aged between 20 and 25) cannot have a very high level of education (for example a PhD degree). In the same time such results suggest that the older generation from this sample is simply less educated than the younger one. This could also make sense, since lately education became more and more important in people's everyday life, thus more and more people decide to invest their time in it. Also the accessibility of education has increased. These two could lead to the picture depicted above. On the other hand if looking at the values of R-squared (0.0600) and Adjusted R-squared (0.0537) we understand that the model is not a good fit for the data. Also the error term is quite big, so the results can hardly be considered statistically significant.

4.2.2.3. General estimations with variable Age dummy

As mentioned in the hypothesis, it is expected for the older generation to be most prone to inequality aversion. The underlying logic is that the older people are the ones who lived longer under the communistic regime and are probably the ones who share the values and ideas (e.g.: idea of equal outcomes) promoted by the regime most. The youngest generation is expected to be the least inequity averse. In order to test for this, the variable Age was transformed from a continuous variable into a dummy variable. This was done in the following way: three groups of age were created (a) from 17 to 35, (b) from 36 to 55 and (c) older than 56; each respondent was assigned to one of the three groups according to his age:

Age_gr_1 – takes the value 1 if the respondent is aged between 17 and 35 and zero otherwise

Age_gr_2 – takes the value 1 if the respondent is aged between 36 and 55 and zero otherwise

Age_gr_3 – takes the value 1 if the respondent is older than 56 and zero otherwise

Number of obs = 150
LR chi2 (7) = 144.60
Prob > chi2 = 0.0000

Log likelihood = -83.519823
Pseudo R2 = 0.4640

Table 9 Ordered probit general estimations for revealed choice (Age dummy)

| Variable | Coeff. | Std. Err. | Z | P> z | [95% Conf. Interval] | | Mean of X |
|----------|-----------|-----------|-------|--------|----------------------|----------|-----------|
| Age_gr_1 | -1.24327 | 0.30077 | -4.13 | -0.000 | -1.83276 | -0.65378 | 0.34667 |
| Age_gr_2 | (omitted) | | | | | | |
| Age_gr_3 | 0.81607 | 0.29343 | 2.78 | 0.005 | 0.24096 | 1.39119 | 0.3 |
| Fem | -0.59519 | 0.25897 | -2.30 | 0.022 | -1.10277 | -0.08761 | 0.50667 |
| Stud | -0.25482 | 0.05992 | -4.25 | 0.000 | -0.37226 | -0.13738 | 15.12 |
| Trans_1 | 1.2794 | 0.49381 | 2.59 | 0.010 | 0.31156 | 2.24725 | 0.37333 |
| Trans_2 | 0.78786 | 0.48248 | 1.63 | 0.102 | -0.15777 | 1.73351 | 0.13333 |
| Trans_3 | 0.35969 | 0.40329 | 0.89 | 0.372 | -0.43076 | 1.15013 | 0.31333 |
| Trans_4 | (omitted) | | | | | | |
| Cut 1 | -3.88496 | 1.13851 | | | -6.11639 | -1.65353 | |
| Cut 2 | -2.65428 | 1.11223 | | | -4.83421 | -0.47436 | |

In the results of this third regression we see no big difference from the result generated by the first regression, where the variable Age was continuous. We see a bit of a better fit, Pseudo R-squared grew from 0.4492 to 0.4640, yet this growth is rather not noteworthy. Only the variables Fem, Stud and Trans_1 are statistically significant. Also the newly created variables Age_gr_1 and Age_gr_3 are significant. This was expected since there were no new data introduced. The only change was that the previous continuous variable Age was split into three dummy variables as described above. This time, not only the dummy variable Trans_4 was omitted by default, but also the variable Age_gr_2. The value of Chi-square is almost same as in the previous regression, thus it can be inferred that the hypothesis of all the coefficients being zero is false. The probabilities, as can be seen in table 7, did not suffer much of a change as well.

Table 10 Probabilities of outcomes for revealed choice (Age dummy)

| Outcome | Probability |
|---------|-------------|
| IA=0 | 40.52544% |
| IA=1 | 43.38802% |
| IA=2 | 16.08654% |

When comparing the coefficients for Age from the first regression with the coefficients for the two dummy variables included for respondents' age we see a quite important change. If in the first regression we see that every additional year would generally increase the probability for the respondent to be inequality averse, in the second regression we see that if the respondent is aged between 17 and 35 his probability of being inequality averse drops (the coefficient obtained for Age_gr_1 is negative) while if he/she is older than 55 this probability rises.

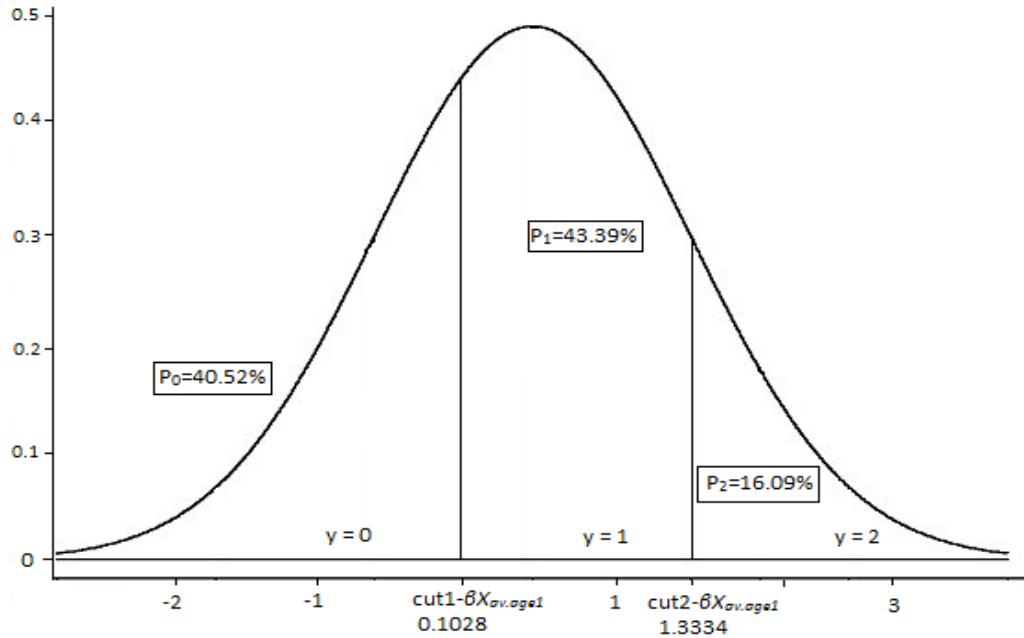


Figure 9 Probabilities of outcomes for revealed choice (Age dummy)

4.2.2.3.1. Partial effects (Age Dummy)

In order create a correct and objective judgment regarding the influence of the two dummy variables designating the age of the respondent there is need to calculate the partial effects of these variables.

Table 11 Estimated partial effects for revealed choice (Age dummy)

| Outcome | Effect | Std. Err. | Z | P> z | [95 % Conf. Interval] | |
|-------------------------|----------|-----------|-------|-------|-----------------------|----------|
| Dummy Variable Age_gr_1 | | | | | | |
| AI = 0 | 0.31532 | 0.09968 | 4.67 | 0.000 | 0.26995 | 0.66069 |
| AI = 1 | -0.21323 | 0.07268 | -2.93 | 0.003 | -0.35569 | -0.07078 |
| AI = 2 | -0.10209 | 0.06025 | -4.18 | 0.000 | -0.37018 | -0.134 |
| Dummy Variable Age_gr_3 | | | | | | |
| AI = 0 | -0.29334 | 0.09384 | -3.13 | 0.002 | -0.47726 | -0.10942 |
| AI = 1 | 0.06425 | 0.0371 | 1.73 | 0.083 | -0.00846 | 0.13697 |
| AI = 2 | 0.22909 | 0.09295 | 2.46 | 0.014 | 0.04691 | 0.41126 |

Dummy Variable Age_gr_1: The numbers in table 8 suggest that the probability of the respondent to be extremely inequality averse drops by 10.209% when he/she is aged between 17 and 35. Also the probability of this group of respondents to have an intermediate level of inequality aversion drops by 21.323%, while the probability them not to be inequality averse rises by 31.532%. These effects proved to be even stronger than expected. The young generation seems to be much less prone to inequality aversion than the older one.

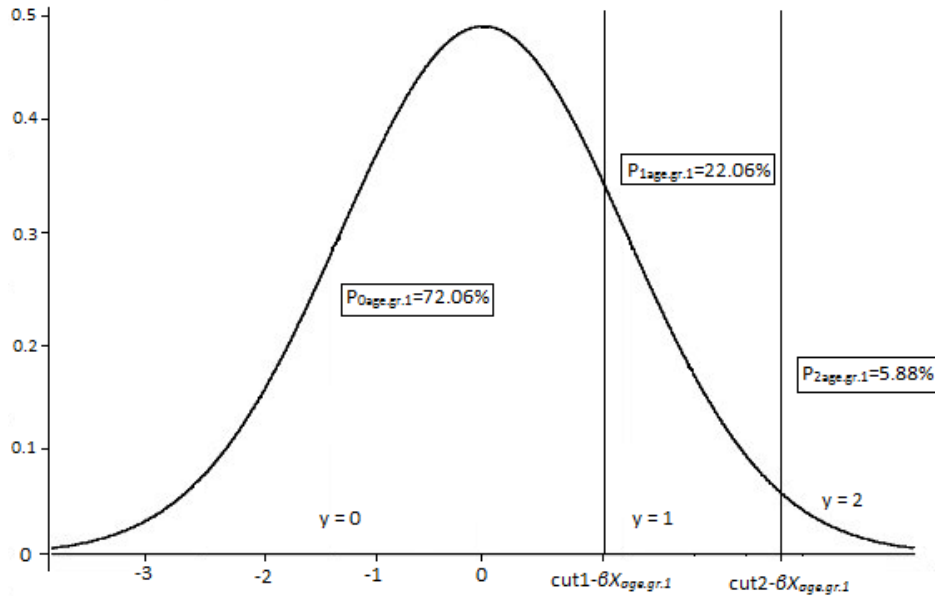


Figure 10 Probabilities with change in variable Age_gr_1 (for choice)

In Figure 10 we see that the two intervals on the right become narrower, while the one on the left becomes much wider, which corresponds to the changes in probabilities calculated above.

Dummy Variable Age_gr_3: The results show that older generation is the one most prone to inequality aversion. Consequently if the respondent is older than 55 (thus belongs to the third group of age) his/her probability of being extremely inequality averse rises by 22.90885% and the probability of having an intermediate level of inequality aversion also rises, but only by 6.425%. In the same time the probability of not being inequality averse, for a respondent older than 55 and with the rest of characteristics held at their mean values, descends by 29.33385%.

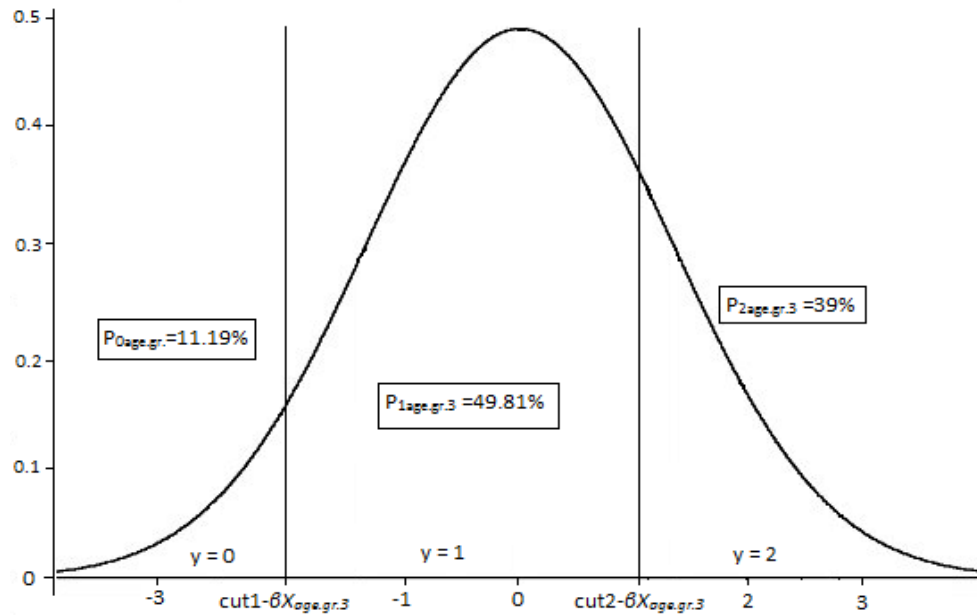


Figure 11 Probabilities with change in variable Age_gr_3 (for choice)

This time the new figure shows a considerable narrowing of the interval on the left, corresponding to the lowering in the probability of the independent variable (IA) taking the value of zero. The middle interval widened a bit and the interval on the left also widened, but more than the middle one. Both these changes match the rise in the probabilities of IA taking the value of 1 and correspondently 2.

4.2.3. Estimating IA in the questionnaires reflecting judgment

4.2.3.1. General estimations with variable Age continuous

The next step in this research was extracting the data from the second type of questionnaires and running the same set of regressions as in section 4.2.2, but this time with the dataset which reveals people's judgment and not their choices.

Number of obs = 150
 LR chi2(6) = 92.89
 Prob > chi2 = 0.0000

Log likelihood = -114.9554
 Pseudo R2 = 0.2878

Table 12 Probabilities of outcomes for judgment (Age continuous)

| Outcome | Probability |
|---------|-------------|
| IA=0 | 27.34904% |
| IA=1 | 37.30063% |
| IA=2 | 35.35033% |

Table 13 Ordered probit general estimations for judgment (Age continuous)

| Variable | Coeff. | Std. Err. | Z | P> z | [95% Conf. Interval] | | Mean of X |
|----------|------------|-----------|-------|-------|----------------------|----------|-----------|
| Age | 0.03656 | 0.00719 | 5.09 | .000 | 0.02248 | 0.05065 | 43.98 |
| Fem | -0.20399 | 0.21609 | -0.94 | 0.345 | -0.62753 | 0.21955 | 0.48 |
| Stud | -0.25293 | 0.04439 | -5.70 | 0.000 | -0.33993 | -0.16592 | 14.6 |
| Trans_1 | 0.22274 | 0.37572 | 0.59 | 0.553 | -0.51367 | 0.95914 | 0.48 |
| Trans_2 | -0.78293 | 0.40683 | -1.92 | 0.054 | -1.5803 | 0.01443 | 0.15333 |
| Trans_3 | -0.6919425 | 0.38701 | -1.79 | 0.074 | -1.4505 | 0.06657 | 0.25333 |
| Trans_4 | (omitted) | | | | | | |
| Cut 1 | -2.97336 | 0.88669 | | | -4.71123 | -1.23549 | |
| Cut 2 | -1.99519 | 0.86818 | | | -3.69678 | -.293594 | |

The ordered probit estimations of the second dataset show that only the age and the level of studies have a statistically significant influence on the respondents' level of inequality aversion. This time the respondent's gender does not matter and also none of the coefficients for the dummies included as income proxies are significant. Regarding the fit of the model it has to be said that unfortunately it is not as good as in the very first regression (the value of Pseudo R-squared is only 0.2878, compared to the 0.4492 in the first regression). On the other hand the Chi-squared indicates again that the probability of all the coefficients obtained in this regression to be zero is very low.

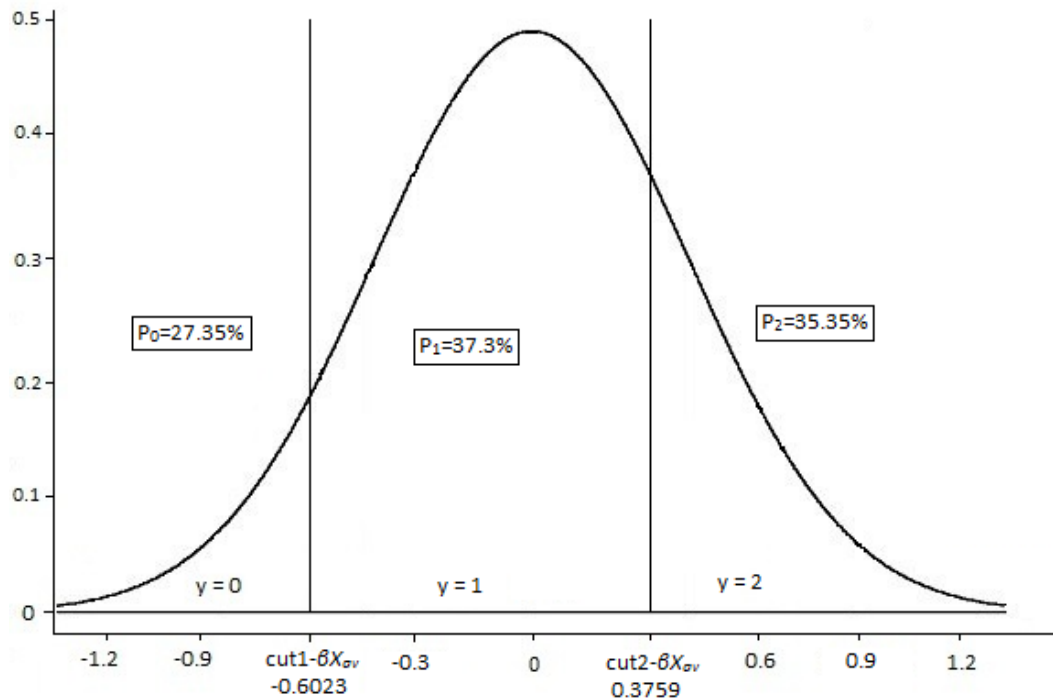


Figure 12 Probabilities of outcomes for judgment (Age continuous)

The figure 9 shows graphically the probabilities of the three possible outcomes for the dependant variable IA. So the probability of a person with average characteristics (age – 43.98 years, gender – male, level of studies - 14.6 years and with a low level of income) to be extremely inequality averse is 35.35%, to have an intermediate level of inequality aversion – 37.3%, and to be not at all inequality averse 27.35%.

If compared to the results obtained in the regression ran with data from the questionnaires which reflected people's revealed choices, here we see quite important changes. First of all, the probability of people to be very inequality averse rose from 17.88% to 35.35% (by 17.47%). It almost doubled! In the same time the probability of people not to be inequality averse decreased by 11.94% (from 39.29% to 27.35%). There is also observed a slight decrease in the probability of people to have an intermediate level of inequality aversion (5.53%), but not as drastic as the previous changes.

What is the explanation for such strong modifications? I will consider two of them, the two most evident and most plausible explanations: 1) we witness here a proof of existence of choice judgment discrepancy; 2) the people are different; or better said, the characteristics of the average person in this population sample changed and this leads to the described changes in probabilities.

First explanation: just like in the research made by Tversky and Griffin, people could be happier with the option offering everybody equal salaries, because it is “socially fair” or because it is more in line with their values and self expectations. In the same time, when it comes to a real choice, a smaller percentage of people decide to go with the option which offers equal payments, instead they give priority to the option offering them a higher absolute salary or a higher relative position. In this order of thoughts the results from the first type of questionnaires (the ones containing the question about the actual choice) should show that people are generally less prone to be inequality aversion than the results obtained from the second type of questionnaires (the ones reflecting people's judgments). The modifications in probabilities we saw before, show exactly this pattern and the reason for them to appear could be the discrepancy between choice and judgment.

Second explanation: to understand how certain changes in average characteristics of the second population sample could affect the outcomes' probabilities we need to analyze each change separately and consider its effect on the outcomes. The table below presents the average values for all the independent variables, yet only the ones which proved to have a statistically significant influence will be discussed.

Table 14 Average characteristics for the two subsamples: choice and judgment

| Var. Name | Age | Fem | Stud | Trans_1 | Trans_2 | Trans_3 | Trans_4 |
|-----------|---------|---------|-------|---------|---------|---------|---------|
| Choice | 45.1933 | 0.50667 | 15.12 | 0.37333 | 0.13333 | 0.31333 | omitted |
| Judgment | 43.98 | 0.48 | 14.6 | 0.48 | 0.15333 | 0.25333 | omitted |

The first characteristic with statistically significant influence is age. The average age of people who provided answers to the questionnaires reflecting choice was 45.19 years. It decreased to 43.98, for the respondents of questionnaires reflecting judgment. In the same time we see that the effect of age is positive in both regressions. Even more, in the tables of partial effects it shows clearly that an increment by one unity in the variable Age will lead to the growth of respondent's probability to be inequality averse (both extremely and at an intermediate level) and will decrease the probability of the respondent not to be prone to inequality aversion. Taking into consideration both, the sign of change in the average age (decrement by 1.21 years) and the effect of this variable, it is impossible to say that this decline in average age could have led to the changes pictured above in the outcomes' probabilities. It is rather the reverse: the decrement in the variable age should increase the probability of people not to be inequality averse and diminish their probabilities to be prone to inequality aversion.

The next change is in the portion of women. If before the respondent with average characteristics was a woman, now this feature changed into man. The results obtained in the first regression show that being a woman increases the probability of respondent not to be inequality averse and decreases her probability to be inequality averse. Thus the change in the average value of the variable Fem, could partly lead to the changes in probabilities of outcomes shown in Fig.8. Yet we have to take into consideration the fact that in the regression ran with the second set of data, the effect of the variable Fem is not statistically significant. This makes it impossible to be sure if the change of gender could have had a real and significant effect on the outcomes' probabilities and even if it did, the coefficients for

this variable are not big enough to have led to such drastic alterations in probabilities as the ones depicted above.

The value of the average studies has decreased as well from 15.12 years to 14.6 years. The effect of this variable is significant in both regressions and is very strong. It raises a lot the probability for the dependant variable to be zero and in the same time decreases its probability to take the values of one and two. Consequently this decline in the average level of studies, just like in the case of age, should lead to the exactly opposite change in the overall probabilities of being inequality averse, than the ones presented above.

The last variable of interest is the proxy included for respondent's level of income. Here is observed no change. Just like in the case of the regression ran with data from the questionnaires reflecting revealed choice, an average person from the second dataset will use public transport most often in his everyday life. In other words the person with average characteristics, from the latest regression, will have more or less the same level of income (low) as the average person from the first regression.

Having said all these, the conclusion is that the growth in probabilities of being inequality averse in the second dataset happened most probably due to the presence of choice judgment discrepancy rather than the changes in average characteristics. The modifications in the characteristics should have produced exactly the reverse effect on probabilities, which means that the discrepancy between revealed choices and judgments would have been even more evident and visible if the average characteristics would have been kept constant.

4.2.3.1.1. Partial effects (Age continuous)

The next step is obtaining the partial effects of each independent variable for each probability of outcome separately. The effects will be discussed below the table of partial effects only for the two independent variables which proved to have a statistically significant influence (i.e. Age and Stud).

Table 15 Estimated partial effects for judgment (Age continuous)

| Outcome | Effect | Std. Err. | Z | P> z | [95 % Conf. Interval] | |
|-------------------------------|----------|-----------|-------|-------|-----------------------|----------|
| Continuous Variable Age | | | | | | |
| AI = 0 | -0.01217 | 0.00241 | -5.04 | 0.000 | -0.01689 | -0.00744 |
| AI = 1 | -0.00143 | 0.00139 | -1.02 | 0.306 | -0.00415 | 0.0013 |
| AI = 2 | 0.01359 | 0.00272 | 5.00 | 0.000 | 0.00826 | 0.01892 |
| Binary (0/1) Variable Fem | | | | | | |
| AI = 0 | 0.06797 | 0.07192 | 0.95 | 0.345 | -0.07299 | 0.20893 |
| AI = 1 | 0.00763 | 0.01098 | 0.69 | 0.487 | -0.01389 | 0.02915 |
| AI = 2 | -0.0756 | 0.07992 | -0.95 | 0.344 | -0.23225 | 0.08105 |
| Continuous Variable Stud | | | | | | |
| AI = 0 | 0.08417 | 0.01533 | 5.49 | 0.000 | 0.05413 | 0.11421 |
| AI = 1 | 0.00986 | 0.00944 | 1.04 | 0.297 | -0.00865 | 0.02837 |
| AI = 2 | -0.09402 | 0.01652 | -5.69 | 0.000 | -0.12639 | -0.06164 |
| Binary (0/1) Variable Trans_1 | | | | | | |
| AI = 0 | -0.07382 | 0.12364 | -0.60 | 0.550 | -0.31615 | 0.16851 |
| AI = 1 | -0.00897 | 0.01801 | -0.50 | 0.619 | -0.04426 | 0.02633 |
| AI = 2 | 0.08279 | 0.13966 | 0.59 | 0.553 | -0.19095 | 0.35653 |
| Binary (0/1) Variable Trans_2 | | | | | | |
| AI = 0 | 0.28912 | 0.15646 | 1.85 | 0.065 | -0.01753 | 0.59577 |
| AI = 1 | -0.03953 | 0.05897 | -0.67 | 0.503 | -0.15511 | 0.07605 |
| AI = 2 | -0.24958 | 0.10478 | -2.38 | 0.017 | -0.45495 | -0.04422 |
| Binary (0/1) Variable Trans_3 | | | | | | |
| AI = 0 | 0.24747 | 0.14443 | 1.71 | 0.086 | -0.03536 | 0.53029 |
| AI = 1 | -0.01301 | 0.0376 | -0.35 | 0.729 | -0.08669 | 0.06067 |
| AI = 2 | -0.23446 | 0.11555 | -2.03 | 0.042 | -0.46093 | -0.00799 |

Continuous variable Age: In table 12 we see that the growth of the average age of the respondent by one year will cause a decrease of 1.21666% in the probability of IA=0. In the same time it will raise the probability of the respondent to be extremely inequality averse, by 1.35912%. If compared to the marginal effects for the variable Age obtained in the first regression, we can say that the numbers are different, yet the magnitude is pretty much the same, there has not been observed any radical change. The only difference is that this time when referring to the effect of age in second cell, where AI=1, we see a negative number. This should mean that an increase in the variable Age will lead to a decrease in the probability of the average person to be somehow inequality averse. It goes a bit against the logic used before in our explanations: the increase in age should lead to a general increase in the probability of people to be inequality averse, both at the extreme level and intermediate. Yet if taking a better look at the values which suggest the statistical significance of the effect in this second cell, we see that the negative coefficient cannot be considered significant and trustful.

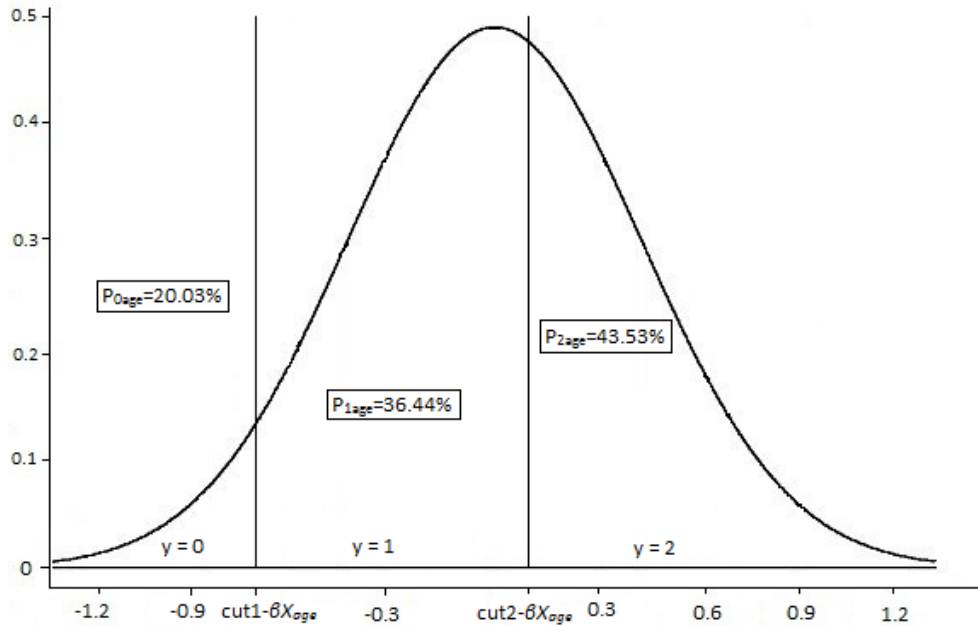


Figure 13 Probabilities with change in variable Age (for judgment)

In order for the marginal effects to be more visible in the figure above, there was considered a growth in the average age by 6.02 units (from 43.98 years to 50 years). The graph shows a significant narrowing of the first interval and a smaller one of the second (which has no statistical significance though, as explained before), while the third interval widened due to the growth in probability of IA=2.

Continuous variable Stud: Table 12 suggests that an additional year of studies would reduce the average person's probability to be extremely inequality averse by 9.40207%. In the same time it should increase the probability of not being inequality averse by 8.41651%. If compared to the marginal effects of the variable Stud in the first regression we can say that the changes here are not that important, again except for the effect presented in the second cell. The first regression gave us a negative coefficient for the effect of studies in the cell where IA=1. This means that the higher the studies are, the lower the probability for the respondent to have an intermediate level of inequity aversion. In table 2.3 though, we see that an increase in years of studies would lead to an increase in the probability of IA=1. Such results could lead to confusions as they make it impossible to get an unambiguous

conclusion. Yet again, just like with the variable Age, this coefficient cannot be considered statistically significant¹⁴.

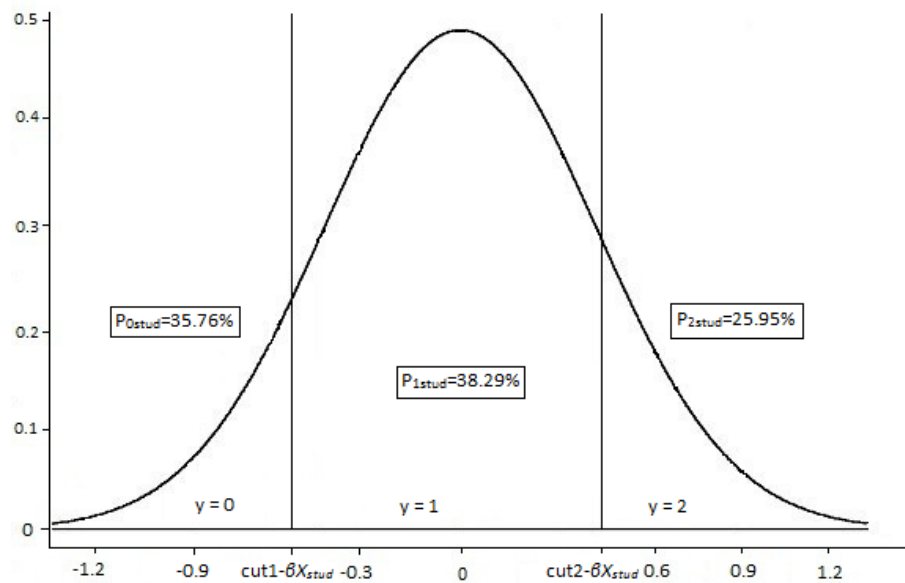


Figure 14 Probabilities with change in variable Stud (for judgment)

As predicted by the new probabilities, Figure 11 illustrates the first two intervals on the left becoming wider, while the last one on the right getting narrower.

4.2.3.2. Testing for dependency between variable Age and variable Stud

If there is observed a dependency between variable Age and variable Stud, the partial effects for both variables, calculated in table 12, could have been estimated incorrectly. In other words the real marginal effects of each of these two variables are bigger than the ones presented in table 12. In order to test for this, just like in section 4.2.2.2, we will regress Age on Stud using OLS.

F(1,148) = 0.09
 Prob > F = 0.7683
 R-squared = 0.0006

Adj R-squared = -0.0062
 Root MSE = 2.8276

Table 16 Estimated OLS Age/Stud, for judgment

| Stud | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] |
|--------|----------|-----------|-------|-------|----------------------|
| Age | 0.00403 | 0.01366 | 0.30 | 0.768 | -0.02296 0.03102 |
| _const | 14.42271 | 0.64348 | 22.41 | 0.000 | 13.15112 15.69431 |

¹⁴ This can be seen in the cell corresponding to the row (IA=1), column (P>|z|), for the variable Stud, where 0.297 > 0.05

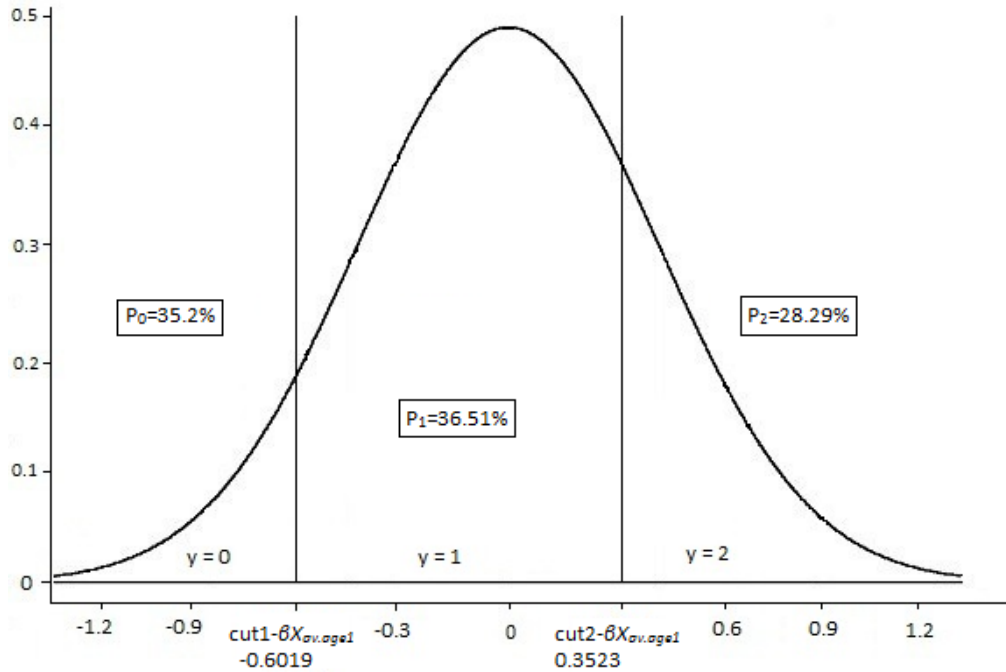


Figure 15. Probabilities of outcomes for judgment (Age dummy)

4.2.3.3.1. *Partial effects (Age Dummy)*

The coefficients for the partial effects for Age_gr_1 will not be commented since they have no statistical significance. The ones for the variable Age_gr_3 proved to be significant only in the second cell. This is a bit confusing, since in the general regression the coefficient for this variable seemed to have quite strong statistical significance.

Table 19 Estimated partial effects for judgment (Age dummy)

| Outcome | Effect | Std. Err. | Z | P> z | [95 % Conf. Interval] | |
|-------------------------|----------|-----------|-------|-------|-----------------------|----------|
| Dummy Variable Age_gr_1 | | | | | | |
| AI = 0 | 0.17127 | 0.09405 | 1.82 | 0.069 | -0.01307 | 0.35561 |
| AI = 1 | 0.00459 | 0.01736 | 0.26 | 0.791 | -0.02943 | 0.03862 |
| AI = 2 | -0.17586 | 0.09028 | -1.95 | 0.051 | -0.35279 | 0.00107 |
| Dummy Variable Age_gr_3 | | | | | | |
| AI = 0 | -0.25757 | 0.06909 | -3.73 | 0.000 | -0.39298 | -0.12217 |
| AI = 1 | -0.07249 | 0.04403 | -1.65 | 0.100 | -0.15879 | 0.01381 |
| AI = 2 | 0.33006 | 0.09985 | 3.31 | 0.001 | 0.13436 | 0.52577 |

Chapter 5

5. Conclusions and More Appropriate Behavioral Models

5.1. Conclusions

The present thesis had two main hypothesis to test. The first one checked for the presence of choice judgment discrepancy and also there was made an attempt to find out the reasons for the existence of this divergence. The second hypothesis tested for the presence of inequality aversion among the 300 interviewed people from the Republic of Moldova. The main characteristics which could influence the level of inequality aversion exhibited by respondents were also analyzed and their absolute effects were measured.

Choice judgment discrepancy was established here once again after Tversky and Griffin's study. And the conclusion to this part of the thesis is the same one as of the two scientists: when people have to make choices they tend to attach more weight to absolute payoffs, while in their judgments they are more sensitive to comparison. First explanation for the obtained results is the one given by T&G, who say that the mechanism of judgment and choice differ and this is why the outcomes obtained for the two are also different.

Another point of view is that the tendency of people to compare their payoffs with the payoffs of others has to do with nonmaterial payoffs. People obtain some nonmaterial payoffs when they are better off than others, which add up to their overall utility and their overall utility decreases when they are worse off than the rest, which implies some nonmaterial costs. Judgment thus will be more sensitive to nonmaterial payoffs and costs, while choice to the material ones. Such an approach leads in the direction of welfare economics and challenges many findings in this area. Of course it still remains unquestionable that income and wealth are very much related to such positive effects like: the wealthier people are much more likely to have better education than the less wealthy ones, also they are the ones who have better health and live longer. From this it should follow that the richer people should be happier. But if this would be so, why would people rank the option with lower absolute payoffs superior to the one with the higher absolute payoffs when being asked which job would make them happier? If people thought that it is their wealth which increases their feeling of happiness with no doubt they would rank higher the option with the higher absolute salary, but according to the results of this study they do not do so.

This does not prove the statement about the positive effects of wealth on the life quality to be faulty, but it does challenge the conclusion that richer people should be happier than the poor ones. Consequently, some scientists consider that, it challenges the main justification of economist's job; that is the belief that "increases in wealth, income or goods generally create the preconditions for greater well-being and happiness" (L. Bruni and P.L. Porta, 2005). My own opinion though is that the challenge refers only to the last part of the sentence. Thus increases in wealth and income do create preconditions for greater well-being, while for happiness it is not always the case. For happiness there exist many other things which influence it, for example the nonmaterial benefits and costs and it is them that have to be analyzed more in depth.

But if it is only judgment that is sensitive to nonmaterial costs and benefits while choice stays unaffected, why would there be need to study them more? After all it is people's revealed choices, their economic behavior, which is analyzed in economics, not their judgments, feelings and attitudes. The answer is quite simple: people's judgments and feeling influence their behavior and sometimes can lead to changes in their preferences and thus choices. That is another point brought up in the present research. It is proved that, when the nonmaterial benefits increase and the material costs and benefits are kept constant, people tend to reverse their preferences. Their choices do not diverge that much from their judgments anymore. This serves as evidence for the statement made before, that people's attitudes and feeling influence their revealed choices and can even reverse them sometimes. Finally this is the major reason for the need of deeper studies of such costs and benefits. There should be found easier and less costly ways (than the brain scanning) of measuring them, so that they can be incorporated into people's utility functions in order to make the predictions of human behavior generated by economic models more congruent with reality and empirical evidence.

A new, quite interesting and unexpected, finding made here is that men seem to be less influenced by their judgments in their choices than women. They are more sensitive to the material payoffs than to nonmaterial payoffs and they need higher nonmaterial incentives to change their choices than in case of women. This makes them closer to the "homo economicus" concept on which all the modern economic theories were built. Men appear to

base their choices more on economic rationality compared to women who tend to be very influenced by their emotions and attitudes.

The second half of the research is shaped around the idea of inequality aversion. The results showed that in the Republic of Moldova people are very much prone to inequality aversion. Respondents reveal strong preference towards options with equal outcomes for themselves and their peers in comparison to the options offering them disadvantageous or even advantageous inequality.

With the help of ordered probit model there were estimated the effects of such characteristics like age, education, income and gender on the respondents' exhibited level of inequality aversion. There was attested strong influence of age and education on inequality aversion levels. They were presented by the shifts in probabilities of being inequality averse. To be more concrete the probability of being prone to inequality aversion would rise with the increase in age and would decrease with the increase in the respondent's education level. Also the influence of age proved to be more extreme when the independent variable Age was treated as a dummy and not as a continuous variable. There was found also evidence of influence of respondent's gender and income, but considerably weaker than in case of age and education and statistically insignificant most times.

5.2. More Appropriate Behavioral Models

We saw that the findings of our second hypothesis contradict the predictions made by SEM. The main reason for this to happen is the fact that none of the standard economic models incorporate in their utility functions the relative payoffs besides the absolute ones. So what we need now is a new model, whose utility function would correct for this flaw, making this model a better fit for the case when there is a significant fraction of population prone to inequality aversion.

There have been developed several models for this kind of situations, the most famous ones being the Fehr-Schmidt model (1999) and the Bolton-Ockenfels model (2000). Both of them can be used to predict the behavior of an inequity averse set of people but they also comprise essential differences which served as the ultimate determinant for the final choice of the best fitting model.

The first distinction is that the FS model considers the differences in outcomes in absolute terms, while the BO model is concerned with inequalities in terms of relative shares. Second: BO offers a symmetrical attitude towards the advantageous and the disadvantageous inequality, while FS says that the coefficient for the disadvantageous inequality is higher than for the advantageous one. In other words according to FS people will be more eager to move towards an option offering equal outcomes to everybody if the other option offers them a lower relative payoff, than if the second option would offer them a higher relative payoff. And the last difference is that while BO compares each person's payoff only with the average payoff, the FS model makes the comparison with both, the minimum and the maximum payoff presented in the list with others' payoffs.

These differences play the role of advantages of the FS model relative to the BO model in the frame of the present study. Actually, they appear to be advantageous not only in the frame of the present study, they make FS superior to BO in general, in terms of empirical discoveries and psychological grounds. Therefore it was decided to choose the FS model as the best replacement for SEM when making predictions of human behavior in a population set with similar characteristics to the ones of the present survey sample, and not the BO model.

5.2.1. *Fehr and Schmidt Model*

Fehr and Schmidt start with the assumption that besides the purely selfish subjects there is a fraction of people who dislike inequitable outcomes. This inequity can occur in the case that the subject is worse off than others and also if he/she is better off. So the utility of a person will depend not only on his material payoffs, but also on the payoffs of others, or better said on the differences between his/her payoff and the other individuals' payoffs.

Mathematically the utility function can be written the following way:

$$U_i(x) = x_i - \alpha_i / (n-1) \sum (x_j - x_i, 0) - \beta_i / (n-1) \sum (x_j - x_i, 0)$$

Where:

$i \in (1, \dots, n)$ – subject's index

n – number of subjects

$x = (x_1, \dots, x_n)$ – the vector of monetary payoffs

α_i – coefficient for the subject i 's aversion towards disadvantageous inequality

β_i - coefficient for the subject i 's aversion towards advantageous inequality

Assumptions:

- 1) $\alpha_i \geq \beta_i$ - means that the utility loss from disadvantageous inequality is greater than the loss from advantageous inequality;
- 2) $0 \leq \beta_i \leq 1$; $0 \leq \beta_i$ - means that there are no subjects who like being better off than others, or better said there are no subjects who experience pleasure from advantageous inequality, even more they suffer from it.

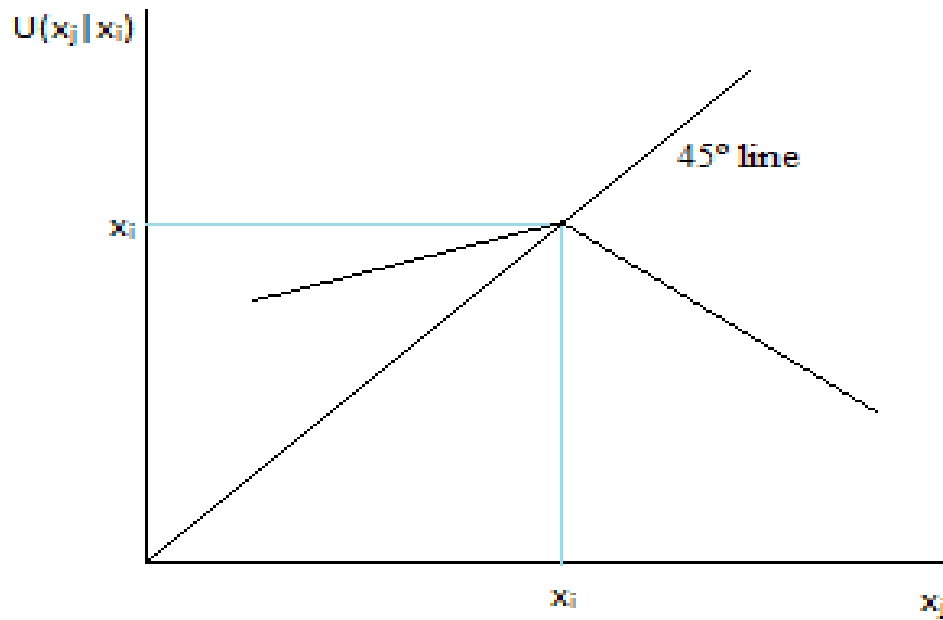


Figure 16 Preferences with inequity aversion

Bibliography

- Loewenstein, Sicherman “Do Workers Prefer Increasing Wage Profiles?”, Journal of Labour Economics, vol. 9, The University of Chicago (1991)
- Morris, A. (2006). *Handbook of Contemporary Behavioural Economics. Foundations and Developments*”, M.E. Sharpe.
- Argyle, M. (1999). *Causes and correlates of happiness*. In D. Kahneman, E. Diener, and N. Schwarz (Eds), *Well-being: The Foundation of Hedonic Psychology*. New York: Russel Sage.
- Smith, A. (1759/1892). *The Theory of Moral Sentiments*. New York: Prometheus.
- Edgeworth, F.Y. (1881). *Mathematical Psychics*. London: Kegan Paul.
- Kahneman, D., Knetsch, J.L., and Thaler, R.H. (1986). *Fairness as a constraint on profit seeking: Entitlements in the market*. American Economic Review, 76(4), 728-41.
- Fehr, E. and Schmidt, K.M. (1999). *A theory of fairness, competition and cooperation*. Quarterly Journal of Economics, 114, 817-68.
- Bolton, G.E. and Ockenfels, A. (2000). *ERC: A theory of equity, reciprocity and competition*. American Economic Review, 90, 166-93.
- Agell, J. and Lundborg, P. (1995). *Theories of pay and unemployment: Survey evidence from Swedish manufacturing firms*. Scandinavian Journal of Economics, 97, 295-50.
- Tversky, A. and Griffin, D. (2000). *Endowments and Contrasts in Judgment of well-being*. In d. Kahneman and A. Tversky (Eds), *Choices, Values and Frames*. New York: Cambridge university Press and the Russel Sage Foundation
- Bewley, T. (1998). *Why not cut pay?* European Economic Review, 42, 459-90.
- Wilkinson, N. (2008). *An Introduction to Behavioral Economics*. Richmond, The American International University in London.
- Camerer, C.F., Lowenstein, G. and Rabin M. (2004). *Advances in Behavioral Economics*. Princeton: Princeton University Press, 287-5.
- Tversky, A. and Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211, 453-58.
- Simon, H.A. (1957). *Models of Man: Social and Rational*. New York: Wiley.
- Shafir, E., Diamond, P. and Tversky, A. (1997). Money Illusion. Quarterly Journal of Economics, 112 (2), 341-74.
- Gul, F., and Psendorfer, W. (2005). *The case of “mindless economics”*. Working Paper, Princeton University, November.
- Blinder, A.S. and Choi, D.H, (1990). *A Shred of Evidence on Theories of Wage Stickiness*. The Quarterly Journal of Economics, MIT Press, vol. 105(4), pages 1003-15, November.

- Campbell, C. and Kamlani K. (1997). *The Reasons for Wage Rigidity: Evidence from a Survey of Firms*. Quarterly Journal of Economics, 112, 789-759.
- Camerer, C. and Thaler, R.H. *Anomalies: Ultimatums, Dictators and Manners*. The Journal of Economic Perspectives, Vol. 9, No. 2.
- Groves, M.R., Fowler, F.J., Couper, M.P., Lepkowski, J.M., Singer, E. and Tourangeau R. (2009). *Survey Methodology*. Second Edition. John Wiley & Sons, Inc., Hoboken, New Jersey.
- Mischel, W. and Metzner, R. (1962). *Preference for delayed reward as a function of age, intelligence and length of delay interval*. Journal of Abnormal Psychology, 64(6), 425-31.
- Harrison, G., Lau, M.I. and Williams, M.B. (2002). *Estimating individual discount rates in Denmark: A field experiment*. American Economic Review, 92, 5, 1606-17.
- Hogarth, R.M. and Reder, M.W. (1987). *Rational Choice: The contrast between Economics and Psychology*. The University of Chicago Press. Chicago and London, 127-101.
- Bruni, L. and Porta P.L. (2005). *Economics and Happiness: framing the analysis*. Oxford University Press. 45-14.
- Akerlof, G.A. and Yellen, J.L. (1990). *The fair wage-effort hypothesis and unemployment*. The Quarterly Journal of Economics, MIT Press, vol. CV, Issue 2, pages 283-255, May.
- International Monetary Fund (2010). *World Economic Outlook Database*. October edition.
- Transparency International (2010). *Corruption Perceptions Index 2010*.

Calculations

Calculations with data from first type of questionnaires:

General estimations for Ordered Probit with variable Age dummy:

$$\begin{aligned}\beta X_{av} &= 0.0486173*45.1933 + (-0.6426622)*0.506667 + (-0.2655067)*15.12 + 1.050736*0.373333 + \\ &0.5590549*0.133333 + 0.2287378*0.313333 = -1.604415818 \\ \text{cut1} - \beta X_{av} &= -1.87616 - (-1.604415818) = -0.271744182 \\ \text{cut2} - \beta X_{av} &= -0.68455 - (-1.604415818) = 0.919865818\end{aligned}$$

Partial effects with variable Age continuous:

Continuous variable Age

$$\begin{aligned}\beta X_{age} &= 0.0486173*50 + (-0.6426622)*0.506667 + (-0.2655067)*15.12 + 1.050736*0.373333 + \\ &0.5590549*0.133333 + 0.2287378*0.313333 = -1.371017204 \\ \text{cut1} - \beta X_{age} &= -1.87616 - (-1.371017204) = -0.505142796 \\ \text{cut2} - \beta X_{age} &= -0.68455 - (-1.371017204) = 0.686467204 \\ P_{0age} &= 0.39290778 + (-0.0186924)*4.8 = 0.30318426 \\ P_{1age} &= 0.42826983 + 0.0059878*4.8 = 0.45701127 \\ P_{2age} &= 0.1788224 + 0.0127046*4.8 = 0.23980448\end{aligned}$$

Dummy variable Fem

$$\begin{aligned}\beta X_{fem} &= 0.0486173*45.1933 + (-0.6426622)*1 + (-0.2655067)*15.12 + 1.050736*0.373333 + \\ &0.5590549*0.133333 + 0.2287378*0.313333 = -1.921462289 \\ \text{cut1} - \beta X_{av} &= -1.87616 - (-1.921462289) = 0.045302289 \\ \text{cut2} - \beta X_{av} &= -0.68455 - (-1.921462289) = 1.236912289 \\ P_{0fem} &= 0.39290778 + 0.242933*1 = 0.63584078 \\ P_{1fem} &= 0.42826983 + (-0.0748199)*1 = 0.35344993 \\ P_{2fem} &= 0.1788224 + (-0.1681131)*1 = 0.010709\end{aligned}$$

Continuous variable Stud

$$\begin{aligned}\beta X_{stud} &= 0.0486173*45.1933 + (-0.6426622)*0.506667 + (-0.2655067)*16.12 + 1.050736*0.373333 + \\ &0.5590549*0.133333 + 0.2287378*0.313333 = -1.869922518 \\ \text{cut1} - \beta X_{av} &= -1.87616 - (-1.869922518) = -0.006237482 \\ \text{cut2} - \beta X_{av} &= -0.68455 - (-1.869922518) = 1.185372518 \\ P_{0stud} &= 0.39290778 + 0.1020822*1 = 0.49498998 \\ P_{1stud} &= 0.42826983 + (-0.0327001)*1 = 0.39556973 \\ P_{2stud} &= 0.1788224 + (-0.0693821)*1 = 0.1094403\end{aligned}$$

Dummy variable Trans_1

$$\begin{aligned}\beta X_{trans_1} &= 0.0486173*45.1933 + (-0.6426622)*0.506667 + (-0.2655067)*15.12 + 1.050736*1 + 0.5590549*0 + \\ &0.2287378*0 = -1.092164809 \\ \text{cut1} - \beta X_{av} &= -1.87616 - (-1.092164809) = 0.401377327 \\ \text{cut2} - \beta X_{av} &= -0.68455 - (-1.092164809) = 0.407614809 \\ P_{0trans_1} &= 0.39290778 + (-0.0866812)*1 = 0.30622658 \\ P_{1trans_1} &= 0.42826983 + 0.0246011*1 = 0.45287093 \\ P_{2trans_1} &= 0.1788224 + 0.0620801*1 = 0.2409025\end{aligned}$$

General estimations for Ordered Probit with variable Age dummy:

$$\begin{aligned}\beta X_{av.age1} &= -1.243269*0.346667 + 0.8160726*0.3 + (-0.6426622)*0.506667 + (-0.2655067)*15.12 + \\ &1.050736*0.373333 + 0.5590549*0.133333 + 0.2287378*0.313333 = -3.987770596 \\ \text{cut1} - \beta X_{av.age1} &= -3.8884959 - (-3.987770596) = 0.102811596\end{aligned}$$

$$\text{cut2} - \beta X_{\text{av.age1}} = -2.654281 - (-3.987770596) = 1.333489596$$

Partial effects with variable Age dummy:

Dummy variable Age gr 1

$$\beta X_{\text{age.gr.1}} = -1.243269*0 + 0.8160726*0 + (-0.6426622)*0.506667 + (-0.2655067)*15.12 + 1.050736*0.373333 + 0.5590549*0.133333 + 0.2287378*0.313333 = -5.044863647$$

$$\text{cut1} - \beta X_{\text{av.age1}} = -3.8884959 - (-5.044863647) = 1.156367747$$

$$\text{cut2} - \beta X_{\text{av.age1}} = -2.654281 - (-5.044863647) = 2.390582647$$

$$P_{0\text{age.gr.1}} = 0.4052544 + 0.3153244 = 0.7205788$$

$$P_{1\text{age.gr.1}} = 0.43388025 + (-0.2132335) = 0.22064675$$

$$P_{2\text{age.gr.1}} = 0.16086535 + (-0.1020909) = 0.05877445$$

Dummy variable Age gr 3

$$\beta X_{\text{age.gr.3}} = -1.243269*0 + 0.8160726*1 + (-0.6426622)*0.506667 + (-0.2655067)*15.12 + 1.050736*0.373333 + 0.5590549*0.133333 + 0.2287378*0.313333 = -4.617667247$$

$$\text{cut1} - \beta X_{\text{av.age1}} = -3.8884959 - (-4.617667247) = 0.729171347$$

$$\text{cut2} - \beta X_{\text{av.age1}} = -2.654281 - (-4.617667247) = 1.963386247$$

$$P_{0\text{age.gr.3}} = 0.4052544 + (-0.2933385) = 0.1119159$$

$$P_{1\text{age.gr.3}} = 0.43388025 + 0.06425 = 0.49813025$$

$$P_{2\text{age.gr.3}} = 0.16086535 + 0.2290885 = 0.38995385$$

Calculations with data from first type of questionnaires:

General estimations for Ordered Probit with variable Age continuous:

$$\beta X_{\text{av}} = 0.0365619*43.98 + (-0.2039894)*0.48 + (-0.2529258)*14.6 + 0.2227369*0.48 + (-0.7829338)*0.153333 + (-0.6919425)*0.253333 = -2.371066976$$

$$\text{cut1} - \beta X_{\text{av}} = -2.973358 - (-2.371066976) = -0.602291024$$

$$\text{cut2} - \beta X_{\text{av}} = -1.995188 - (-2.371066976) = 0.375878976$$

Partial effects with variable Age continuous:

Continuous variable Age

$$\beta X_{\text{age}} = 0.0365619*50 + (-0.2039894)*0.48 + (-0.2529258)*14.6 + 0.2227369*0.48 + (-0.7829338)*0.153333 + (-0.6919425)*0.253333 = -2.150964338$$

$$\text{cut1} - \beta X_{\text{av}} = -2.973358 - (-2.150964338) = -0.822393242$$

$$\text{cut2} - \beta X_{\text{av}} = -1.995188 - (-2.150964338) = 0.155776338$$

$$P_{0\text{age}} = 0.2734904 + (-0.0121666)*6.02 = 0.2002474468$$

$$P_{1\text{age}} = 0.37300633 + (-0.0014247)*6.02 = 0.364429636$$

$$P_{2\text{age}} = 0.35350326 + 0.0135912*6.02 = 0.435322284$$

Continuous variable Stud

$$\beta X_{\text{stud}} = 0.0365619*43.98 + (-0.2039894)*0.48 + (-0.2529258)*15.6 + 0.2227369*0.48 + (-0.7829338)*0.153333 + (-0.6919425)*0.253333 = -2.623992776$$

$$\text{cut1} - \beta X_{\text{av}} = -2.973358 - (-2.623992776) = -0.349365224$$

$$\text{cut2} - \beta X_{\text{av}} = -1.995188 - (-2.623992776) = 0.628804776$$

$$P_{0\text{stud}} = 0.2734904 + 0.0841651 * 1 = 0.3576555$$

$$P_{1\text{stud}} = 0.37300633 + 0.0098556 * 1 = 0.38286193$$

$$P_{2\text{stud}} = 0.35350326 + (-0.0940207) * 1 = 0.25948256$$

General estimations for Ordered Probit with variable Age dummy:

$$\beta X_{\text{av.age.1}} = -0.4914507 * 0.36 + 0.869718 * 0.293333 + (-0.1941053) * 0.48 + (-0.263362) * 14.6 + 0.2275242 * 0.153333 + (-0.6854745) * 0.253333 = -3.998827349$$

$$\text{cut1} - \beta X_{\text{av.age.1}} = -4.6007113 - (-3.998827349) = -0.60188395$$

$$\text{cut2} - \beta X_{\text{av.age.1}} = -3.646515 - (-3.998827349) = 0.352312349$$