

LIFE SATISFACTION AND DONATION TO CHARITABLE ORGANIZATIONS

A Master's Thesis

by
ZÜLFÜKAR EMİR ÖZER

Department of
Economics
İhsan Doğramacı Bilkent University
Ankara
August 2014

I dedicate this thesis to my family and Hazal

LIFE SATISFACTION AND DONATION TO CHARITABLE ORGANIZATIONS

**Graduate School of Economics and Social Sciences
of
İhsan Doğramacı Bilkent University**

by

ZÜLFÜKAR EMİR ÖZER

**In Partial Fulfillment of the Requirements For the Degree
of
MASTER OF ARTS**

in

**THE DEPARTMENT OF
ECONOMICS
İHSAN DOĞRAMACI BILKENT UNIVERSITY
ANKARA**

AUGUST 2014

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Assoc. Prof. Çağla Ökten

Supervisor

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Asst. Prof. Banu Demir Pakel

Examining Committee Member

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Assoc. Prof. Andrea Rehberg

Examining Committee Member

Approval of the Graduate School of Economics and Social Sciences

Prof. Dr. Erdal Erel

Director

ABSTRACT

LIFE SATISFACTION AND DONATION TO CHARITABLE ORGANIZATIONS

ÖZER, ZÜLFÜKAR EMİR

M.A., Department of Economics

Supervisor: Assoc. Prof. Çağla Ökten

August 2014

In this thesis, the empirical link between individuals' donations to charitable organizations and their levels of life satisfaction is analysed, and the warm glow motive is tested in this context. Using a national representative data from US, I observed that there is a positive correlation between reported life satisfaction and individuals' acts of giving. First, I found that individuals who donate to charitable organizations report a higher level of life satisfaction. Second, I found that individuals' reported life satisfaction levels are proportional to their amount of contribution to public goods. Consistent with the warm-glow motive, the life satisfaction level depends on individuals' own act of giving and their amount of donation. Third, by using instrumental variables techniques and selection on observed and unobserved variables method, the causal relation between the act of donation and individuals' reported well-being is shown. Fourth, it is observed that the act of giving affects the individuals' subjective well-being with regard to which type of organization they donate to. In this regard, the relation between donation to secular and non-secular charitable organizations and subjective well-being is examined.

Keywords: Impure altruism model, warm-glow, life satisfaction, donation, instrumental variables technique, selection on observable and unobservable variables, causal relation.

ÖZET

HAYIR KURULUŞLARINA BAĞIŞ VE YAŞAM MEMNUNİYETİ

ÖZER, ZÜLFÜKAR EMİR

Yüksek Lisans, Ekonomi Bölümü

Tez Yöneticisi: Doç. Dr. Çağla Ökten

Ağustos 2014

Bu tezde, bireylerin bağışları ve yaşam memnuniyetleri arasındaki ilişki ve bu bağlamda saf olmayan özgecilik modelinin bir konusu olan ‘Vermenin Sıcak Parıltısı’ motivasyonu test edildi. İlk olarak, Birleşik Devletler’de uygulanan geniş bir örnek veri kullanılarak bireylerin belirttiği yaşam memnuniyeti ve verme eylemleri arasında bir ilişki olduğu gözlemlendi. Yardım Kuruluşlarına bağışta bulunan bireylerin daha yüksek yaşam memnuniyeti bildirdiği gösterildi. İkinci olarak, bireylerin yaşam memnuniyeti yaptıkları bağış miktarı ile orantılı olduğu bulundu. ‘Vermenin Sıcak Parıltısı’ motivasyonuna uyumlu olarak, yaşam memnuniyeti seviyesinin yardımın miktarına ve verme eyleminin kendisine bağlı olduğu anlaşıldı. Üçüncü olarak, araç değişken model ve gözlenen ve gözlemlenemeyen değişkenler model kullanarak, bağışta bulunma ve bireylerin belirttiği mutluluk seviyeleri arasında nedensel bir ilişki olduğu gösterildi. Dördüncü olarak, bireylerin yardımda bulunma eylemleri onların öznel mutluluk seviyelerini yardımda bulundukları yardım kuruluşunun türüne bağlı olarak gözlemlendi. Bu bağlamda, bireylerin seküler ve seküler olmayan yardım kuruluşlarına yaptıkları yardımlarla bireylerin belirttiği yaşam memnuniyeti arasındaki ilişki incelendi.

Anahtar Kelimeler: Özgecılık modeli, vermenin sıcak parıltısı, yaşam memnuniyeti, bağış, araç deęişken model, gözlenen ve gözlemlenemeyen deęişkenler model.

ACKNOWLEDGEMENTS

I would like to thank and express my sincere gratitude to my advisor Assoc. Prof. Çağla Ökten for all I have learned from her and for her continuous help and support in all stages of this thesis. Without her support I could not have finished my thesis. I would also like to thank Asst. Prof. Banu Demir Pakel for commenting on my views and helping me understand my questions in a broader sense. My sincere thanks also goes to Assoc. Prof. Andrea Rehberg for encouraging me to complete my thesis. I would also like to express my gratitude to Bilkent University Graduate School of Economics and Social Sciences for their financial support.

My colleagues, Abdülkadir, Cihan, Elif, Davut, Giray have all extended their support in a very special way, and I learnt a lot from them, through their personal and scholarly interactions, and their suggestions at various points of my research.

Equally importantly, none of this would have been possible without the love and moral support of my family. I would like to acknowledge my parents Vefa Özer and Meral Özer, my brother Yunus Emre Özer and my sister Nezahat Didar Özer.

Lastly, and most importantly, I am very much indebted to my love, Hazal Babur, who supported and encouraged me in every possible way. She was always there for me when I did not think I could continue work on this thesis.

TABLE OF CONTENTS

ABSTRACT	iii
ÖZET	v
ACKNOWLEDGEMENTS	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	x
CHAPTER 1: INTRODUCTION	1
CHAPTER 2: THE MODEL	5
2.1 The Micro-econometric Happiness Function	5
CHAPTER 3: ESTIMATION	8
3.1 Data	8
3.2 Estimation of The Utility Function model	9
CHAPTER 4: ESTIMATION RESULTS	13
4.1 Instrumental Variables Estimation and Selection on Unobserv- ables Required to Explain the Donation Effect	21
4.1.1 Instrumental Variables Estimation	21
CHAPTER 5: CONCLUSION	24
BIBLIOGRAPHY	26

APPENDICES	29
5.1 Using Selection on Observed Variables to Address Selection on Unobserved Variables	29

LIST OF TABLES

4.1	Descriptive Statistics	15
4.2	OLS Regressions	16
4.3	Descriptive Statistics for Religious and Non-Religious Individuals	18
4.4	OLS Regressions for Religious and Non-religious People - With Don-Secular and Don-Nonsecular (dummy)	19
4.5	OLS Regressions for Religious and Non-religious People - With Don-Secular and Don-Nonsecular (amount)	20
4.6	IV Regressions and Instruments validities	23
5.1	Effect of factors in Subsample and Whole Sample	32
5.2	The Amount of Selection on Unobservables Relative to Selec- tion on Observables in Order to Find the Effect of Donation on Selection Bias	32

CHAPTER 1

INTRODUCTION

Contributions to public goods are crucial for the provision of public goods so that understanding the reason why individuals contribute is very important. The model of warm-glow giving provides an answer to the question why people donate. According to this model individuals donate because they receive utility from their own donation. In this model, individuals' well-being does not depend on only total level of public goods but also the contribution they make. In this thesis, individuals' donations to charitable organizations as providers of public goods are examined to provide an empirical evidence for or against the warm-glow model.

By using a broad US sample, it is found that individuals who donate to charitable organizations declare a higher level of life satisfaction than individuals who do not donate. By using the instrumental variable technique, which is done by using the donation characteristics of individuals observed in recent years, it is shown that the relation between donation and subjective well-being is one-directional. In addition to that, to find more empirical evidence for this causal relationship, the selection on observed and unobserved variables method is used. It is also observed that an increase in donation amount increases individuals' life satisfaction levels. This result is consistent

with the assumption of the warm-glow according to which individuals' own contribution to public goods generates or increases the utility beside their amount of donation.

Recent studies have shown that models in which voluntary contributions are considered as public goods are not consistent with the observed data. Before these studies took place, contributions had been taken as public good, but as shown by Sugden (1982, 1999) individuals' contributions are not perfect substitutes, because individuals' utilities also increase by their own act of giving (Andreoni 1989 and 1990). In this respect, Andreoni (1989) introduces a generalization of the standard public goods model which includes impurely altruistic motives. Andreoni (1990) also shows that people do not only get utility from public goods' total supply, but they also gain utility from their acts of giving when they make donations to public goods. Therefore, these studies show that individuals are not indifferent between contributions they themselves make and contributions made by others. This thesis shows the direct relation between contribution and level of individuals' life satisfaction so that it gives direct empirical evidence for the warm-glow motive. Sugden (1999) argues that individuals increase their life satisfaction level by contributing to public goods for two reasons. First, they get satisfaction because they comply with societal norms. Second, by contributing they develop their self-esteem. In this context, Videras and Owen (2006) demonstrate an empirical evidence for the first argument. According to their study, individuals gain utility, by contributing to public goods, if they limit their free-riding attitudes to comply with the societal norms. Brekke, Kverndokk, Nyborg (2003) present a model according to which gaining utility from contribution to public good depends on individuals' self-sanctioned norms. In contrast to these approaches, VanderHoff (2012) demonstrates that there is a positive relation between ethnic diversity and religious giving. According to his study,

in a more ethnically diverse community, religious contributions are higher. Moreover, analyses in the study of Hungerman (2008) indicate that contribution to the local charities is less if there are more African-Americans in the area. By contrast to all these studies, in this present thesis I showed that individuals are not indifferent to public goods so that the type of the public good or the organization to which they contribute is another motivation for them.

In contrast to approaches which consider utility based on individuals' observed revealed or stated choices, my approach in this study takes the subjectivist approach into account. For instance, in their objectivist approach Nunes and Schokkaert (2003) evaluate differences between individuals' warm-glow by carrying out a factor analysis on a list of attitudinal items. Instead of standard economic theory based on an 'objectivist' understanding which concerns observable choices, my approach considers subjective well-being. According to Frey and Stutzer (2002), to study a subjective model is more fruitful than the objective utility model, because it is related with both experienced and procedural utilities. In addition to that, their happiness is the primary concern for many individuals. In other words, we do not demand things for themselves; we acquire things for ourselves, for our own well-being. Moreover, since the subjective happiness of individuals is related to their well-being, studying individuals' reported happiness gives us the opportunity to examine some fundamental principles and suppositions of economic theory. In this regard, my work is related to the study of Meier and Stutzer (2005), which shows that volunteering increases individuals' reported level of well-being. In addition, Videras and Owen (2006) demonstrate that contributions to public goods by recycling, purchasing environmentally-friendly products, conserving water and contributing to environmentally groups also increase individuals' self-reported happiness level.

Consistent the above-mentioned studies, I also studied individuals' contributions to public goods. However, in this thesis, in contrast to the above-mentioned studies, I take any donation to any charitable organization as an act of giving to examine the validity of the warm-glow model and we find that individuals who donate to charitable organizations report higher levels of happiness than individuals who do not. I also observe that any increase in the donation amount increases individuals' level of happiness. Consistent with the warm-glow theory, individuals are warm-glow givers so that they receive utility from their own contribution to public goods. Moreover, I consider donation to specific types of charitable organizations to see whether they matter for individuals or not. Finally, to show the causal effect between the act of giving and individuals' subjective well-being, the instrumental variables technique is used. In other words, the instrumental variable method is applied to show that individuals express a higher life satisfaction level because they donate to charitable organizations, not the other way around.

The contributions of this thesis to the literature are, first, that its findings apply to a broad sample of individuals in the US; second, I work not only on the contribution to one type of charitable organization but also to different types of charitable organizations; third, consistent with the warm-glow motive, I show that individuals' well-being increases with their act of giving and their amount of contribution to charitable organizations. Finally, the causal relation between the individuals' donation to charitable organizations and individuals' reported well-being is shown by using the instrumental variables technique which is also supported by another model called selection on observed and unobserved variables. Therefore, I present a strong evidence for the warm-glow theory in this thesis.

CHAPTER 2

THE MODEL

2.1 The Micro-econometric Happiness Function

The traditional subjective understanding of utility considers individuals' reported well-being as utility, because they are the best authority to evaluate their own well-beings. In this regard, by asking one or more questions in surveys, individuals' level of well-being can be assessed. Veenhoven (1993), in his detailed study, considers doubts about self-reported well-being levels. One of the doubts concerns the fact that individuals would be unaware of their well-being, but according to Veenhoven's study eight out of ten people consider their own well-being once a week or more. He also claims that individuals evaluate their happiness level by comparing their circumstances now with those of the past and ones anticipated in the future. In addition to that, Erhardt, Saris and Veenhoven (2000) demonstrate that the subjective evaluation of well-being is stable and sensitive to altering circumstances so that subjective well-being or life satisfaction level can be considered as representative of utility. Consistent with the approaches discussed above, Frey and Stutzer (2002), as well as Carbonell and Frijters (2004), propose a micro-econometric model of happiness function.

$$W_{it} = \alpha + \beta X_{it} + \epsilon_{it} \quad (1)$$

where i represents individual and t represents time

$X = x_1, x_2, \dots, x_n$ are socio-demographic and socio-economic factors

ϵ is error term

This micro-econometric model can thus be used to examine the relation with self-reported well-being level and each factor. Stutzer and Frey (2002) demonstrate that ϵ , error term, captures measurement errors and unobserved characteristics. They think that mistakes made by individuals, the order and expression of questions in the survey are random so that estimation results are not biased by these mistakes. Moreover, they suggest that even if there are non-sampling time-invariant errors correlated with the factors, by doing surveys for years, these effects can be controlled. In this thesis, since I do not have panel data over time, the correlation of the error term and factors is prevented by introducing many socio-demographic, socio-economic factors and proxy personality traits related to individuals' well-being as Knight, Song and Gunatilaka (2009) do. As a result, self-reported or subjective well-being is a very useful and satisfying approximation to utility.

To determine the socio-demographic and socio-economic factors, many studies are taken into consideration in this thesis. Clark and Oswald (1994) show that unemployed people report lower well-being levels than employed people do. Oswald (1997) demonstrate that there is a correlation between real income and the happiness level of individuals. Frey and Stutzer (2005) study the relation between marriage status and subjective well-being of individuals. According to their study, the self-reported well-being of married people is greater than that of single individuals'. In addition to this, they point out that the welfare of an individual is one of the determinants for individual's

subjective well-being. Frey and Stutzer (2002) also demonstrate that young individuals report lower levels of well-being than older ones, but Videras and Owen (2006) show that older people express lower levels of well-being. They assumed that there is a linear relation between age and individuals' levels of well being. However, to see that whether the relation is linear or nonlinear I included the age-square term in my equation. VanderHoff (2012), Blanchflower and Oswald (2004) propose that there is relation between the of the individual and his/her subjective well-being. In the same study Blanchflower and Oswald find that an individual's gender is effective on his/her well-being. Videras and Owen (2006) consider education, health, and religiosity levels as effective factors and include these factors into their regressions. To see whether individuals' religious affiliation is effective or not, their religion is added to the regression in this thesis. Therefore, the factors stated above are taken into consideration in this thesis.

CHAPTER 3

ESTIMATION

3.1 Data

In this thesis, the empirical analysis is based on the data of The Panel Study of Income Dynamics (PSID) which is a national representative data from US. The survey began in 1968 and it is directed by the Survey Research Center, University of Michigan. The data sources used in this study are twofold: the Main Family Data and Individual Data. The Main Family Data and Individual Data are based on surveys covering information about individuals and their descendants including data covering employment, income, wealth, expenditures, health, marriage, childbearing, child-development, philanthropy, education and many other themes. Collection of the PSID is done annually and data included in this study is about more than 10,000 individuals. However, some of the interview questions related to my thesis are about the head and/or wife of the family, whereas data collected from interviews done with other members of families are discarded in this thesis. For instance, a question related to the subjective well-being of the respondent is asked, but in the same interview, the health status of a head of the family and wife is being asked about. In addition to that for the consistency of the study, data collected from interviews of very low-income families called Survey of

Economic Opportunity is also discarded. Both the section on philanthropy and the question of well-being are contained in the 2009 survey, and so the data used in this thesis was collected in 2009 and it contains more than 8,000 individuals' information. The question of well-being is only contained in the 2009 survey and the section on philanthropy is in 2003, 2005, 2007 and 2009 surveys.

3.2 Estimation of The Utility Function model

To study the relation between and individual's donation to charitable organizations and his/her well-being, we assume Frey and Stutzer's (2002) model that well-being of individual i is a variable measured by

$$\begin{aligned} satisfaction_i &= B_0 + B_1donation_i + B_2X_i + B_3Y_i + d_i \quad (2) \\ (satisfaction_i &= B_0 + \alpha donation_i + X_i'\zeta + \epsilon_i \quad (2')) \end{aligned}$$

where **donation** is the dummy variable denoting the donation to any charitable organization made by an individual. We do not observe the exact value of life **satisfaction**, the well-being of the individual, in the data. Rather, it is measured on a scale from 1 to 5. **X** denotes dummy variables such as gender, employment, marital status, education, race, and the religious status of individuals which are considered as factors having effects on individual's self-reported level of well-being. **Y** denotes explanatory variables related to the health, age, and income of individuals which are considered to have effects on their level of well-being. In order to explain the factors to the reader in a clear, socio-demographic factors are divided into two groups. However, our equation can also be shown as in the equation (2'). The self-reported happiness level is treated as it is continuous. In addition to that, Carbonell and Frijters (2004) find that the Ordinary Least Squares (OLS) es-

timisation method does not distort the findings. According to their study, the OLS estimation method is as successful as other ordinal estimation methods and probit logit models. Therefore, instead of other estimation methods, the OLS estimation method is used to demonstrate the effect of factors and the act of giving on the subjective well-being of individuals.

As a result of OLS estimation, it is expected for B_1 to be positive if the well-being level of the individual is increased by the act of donation to charitable organisations. In addition to that, to find another empirical evidence for the warm-glow motive, the relation between individuals' well-being levels and the amount of donation they give is examined with the equation below:

$$satisfaction_i = B_0 + B_1 donationamount_i + B_2 X_i + B_3 Y_i + d_i \quad (3)$$

Measure of satisfaction

An individual's subjective level of well-being is derived from the question, 'Please think about your life-as-a-whole. How satisfied are you with it?'. ***Satisfaction***, the well-being level, is measured on a scale from 1 to 5, with 5 being the highest level. The sample median equals to 3.76, the 25- and 75- percentile are 3 and 6 respectively. The question of life satisfaction is considered as an indicator of individuals' well-being. The question is asked annually and individuals consider their overall well-being in that year.

Measures of donations to charitable organizations

The warm-glow giving motive applies to different kinds of contributions and the data in this paper allows us to test donations to different charitable organizations. The data also contains questions that determine the amount of donations that individuals contribute to each type of charitable organizations.

With this data the relation between the amount of donation and the well-being level of individuals can be also examined. For this reason, 3 dummy variables and 1 explanatory variables are constructed. The first dummy variable is about whether a person makes any donation to any charitable organization or not. Our main question - does the act of giving or donation increase individuals' well-being levels? - is examined with this dummy variable. Others are about donation to specific types of charitable organizations which are either secular or non-secular. Charities for needy people, for people's health, for the young, for improving and preserving the culture, for the community, for environmental protection, for international peace, for educational purposes and for other purposes are grouped into the secular group; whereas charities for religious purposes, for a combination of religious and other purposes are put into the non-secular group. With these dummy variables, I try to find out whether there is a religious motivation for individuals to make donations. For this reason, we also test whether there is a difference between individuals who report religious preference and people who do not with regard to their donation character. Explanatory variables indicate the amount of donations to charitable organizations. With the explanatory variable, i.e., individuals' total donation to charitable organizations, I examine whether the well-being level of individuals increases with the increase in the amount of their donation or not. In this regard, logarithm of amount of donation is included to the equation. In addition to that logarithm of amount of donation over individuals' income is also contained in the equation.

Other factors related to life-satisfaction

As mentioned above, there are other factors that may be related to the life satisfaction of individuals. They are divided into two groups: explanatory variables and dummy variables. Explanatory variables are *health*, *age*, *income*, *wealth*. The *health* level of an individual is derived from the answer

to the question 'would you say your health is in general excellent, very good, good, fair, or poor?'. Thus, health is measured on a scale from 1 to 5, with 5 being highest. The *income* and *wealth* of individuals are calculated by asking them many detailed questions and net total income and total wealth in 2009 are separately as two variables. In our regressions, a logarithm of income and logarithm of wealth is used to see the effect of change in the annual income and level of wealth more accurately. For instance, a 2000 TL raise for an individual who earns 10,000 TL annually is considered a good raise and makes that person happy, but this raise does not make an individual happy who earns 150000 annually. The second reason for using a logarithm of income and logarithm of wealth is that logarithm of a variable is usually more normally distributed so that the effect of change of income and wealth on a dependent variable can be seen more accurately. Dummy variables are *gender*, *employment*, *marital status*, *education*, *race*, *religion*. *Education*, *race* and *religion* are the group of dummy variables in this thesis. For education, there are three variables that indicates whether a person is graduated from high school but not graduated from college, (*hsdegree*); graduated from college (*collegedegree*) or whether a person does not have any degree, (*nodegree*) . For race, there are dummy variables indicating whether person is , white , Black/African-American/Negro, American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, Other. White and black/African-American/Negro individuals are much more prevalent than those in other categories. For this reason, and to see the other races' effect, American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, Other variables are gathered into one variable called (*raceother*). For religion, there are dummy variables None, Catholic, Jewish, Protestant, Non-Christian/Muslim/Buddhist, Greek/Russian/Eastern Orthodox, others. In the same way, religion indicator variables are gathered into four different groups: (*religioncatholic*), (*religionprotestant*), (*religionother*), (*noreligion*).

CHAPTER 4

ESTIMATION RESULTS

In this section, first, the descriptive statistics of explanatory and dummy variables are given in the table 4.1. PSID dataset of Schoeni (2002) consists of 893 observation to test the relation between employment insurance and familial assistance. In addition to that, Reinstein (2009) uses the PSID data set which contains 1304 observation to study the expenditure substitution. The observation number of this study is 8063 which is enough to test the warm-glow model. The first observation from the descriptive statistics is the percentage of individuals who donate to any charitable organizations. The percentage is 71, which indicates that the contribution to the public good is not only made by a few people; rather, most of the individuals interviewed report that they provide voluntary donations to charitable organizations. The subjective well-being level of individuals as the dependent variable is estimated by using equations 1 and 2. The results of these estimations are demonstrated by table 4.2. In the first equation, along with explanatory socio-demographic, socio-economic and individual factors, donation as a dummy variable is included in the equation to see the effect of the act of giving on the subjective well-being of individuals. The result of this estimation is presented in the first column of table 4.2. In the second equation, instead of donation as a dummy variable, the donation amount is taken into account. The result of the second OLS

regression can be seen in the second column of the table 4.2.

Consistent with the literature, first, it is observed that the subjective health level and marital statuses are effective on the subjective well-being of individuals. Individuals, who report a higher health level, also report a higher level of well-being. Moreover, married people are more likely to report a high level of well-being. Second, the unemployment factor has a negative sign, as expected. Older people are less likely to report a high level of well-being. Third, individual's level of income and level of wealth has a positive effect on their life satisfaction. In addition to that, the educational level and the race of an individual do not change their level of well-being. Individuals who report that they are Protestant, reports a higher level of well-being than others and for others, religion is not an effective factor on their well-being levels. Focusing on the act of giving, the donation factor, I find that donation is a positive factor that makes people feel happier. With this result we find an empirical evidence for the warm-glow motive. I also show that the amount of the donation affects well-being levels of individuals as expected. Put differently, contributing as an act is also positively associated with people's happiness level apart from the affect of the individuals' amount of donation.

PSID survey data allows us to study different factors that affect the act of giving and the subjective well-being level of individuals. At this stage, charitable organizations are divided into two groups: secular and non-secular. In the first column of table 4.4, the effects of contribution to secular and non-secular charitable organizations, respectively, are interrogated. As a result of these regressions, individuals who contribute to a non-secular organization also report a higher level of well-being level as seen in the first column of the table 4.4. Contributing to secular organizations does not have a significant effect on the subjective well-being.

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max
SATISFACTION	3.85	0.80	1	5
DONATION (DUMMY)	0.71	0.45	0	1
DONATION (AMOUNT)	5592.85	32409.40	0	799984
LOG-DONATION (AMOUNT)	4.97	3.52	0	13.59
HEALTH	3.62	1.01	1	5
MARRIED	0.77	0.42	0	1
GENDER	0.48	0.50	0	1
UNEMPLOYED	0.16	0.36	0	1
AGE	45.54	15.85	17	95
AGE2	2325.41	1588.23	289	9025
LOG(INCOME)	11.89	0.41	11.15	15.67
WEALTH	1408946	2595895	38001	102000000
LOG (WEALTH)	14.02	0.37	10.55	18.44
HIGHSCHOOL	0.44	0.50	0	1
COLLEGE	0.43	0.50	0	1
NODEGREE	0.13	0.34	0	1
RACEWHITE	0.89	0.31	0	1
RACEBLACK	7.44E-2	0.26	0	1
RACEOTHER	3.11E-2	0.17	0	1
REL-CATHOLIC	0.20	0.40	0	1
REL-PROTESTANT	0.56	0.50	0	1
REL-OTHER	8.90E-2	0.28	0	1
REL-NO	0.16	0.36	0	1

The number of observation is 8063

Table 4.2: OLS Regressions

Variable	donation (dummy)	donation (amount)
DONATION (DUMMY)	0.0868*** (0.0206)	
LOG-DONATION (AMOUNT)		0.0151*** (0.00283)
HEALTH	0.211*** (0.00894)	0.210*** (0.00895)
MARRIED	0.271*** (0.0220)	0.268*** (0.0220)
GENDER	-0.0301* (0.0167)	-0.0292* (0.0167)
UNEMPLOYMENT	-0.336*** (0.0357)	-0.335*** (0.0357)
AGE	-0.0172*** (0.00316)	-0.0172*** (0.00315)
AGE2	0.000203*** (3.13e-05)	0.000200*** (3.13e-05)
LOG(INCOME)	0.0505* (0.0281)	0.0380 (0.0283)
LOG (WEALTH)	0.0773*** (0.0277)	0.0678** (0.0278)
HIGHSCHOOL	-0.0316 (0.0268)	-0.0318 (0.0267)
COLLEGE	-0.00395 (0.0291)	-0.00912 (0.0290)
RACEBLACK	-0.00221 (0.0326)	-0.000583 (0.0326)
RACEOTHER	0.0760 (0.0481)	0.0770 (0.0481)
REL-CATHOLIC	0.0151 (0.0287)	0.0147 (0.0287)
REL-PROTESTANT	0.0594** (0.0243)	0.0536** (0.0243)
REL-OTHER	-0.0682* (0.0351)	-0.0706** (0.0353)
Constant	1.455*** (0.380)	1.745*** (0.388)
Observations	8,063	8,063
R-squared	0.138	0.140

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Following from this point, examining the participants according to their religious beliefs becomes necessary, because donation to non-secular charitable organizations makes individuals happier. In this regard, respondents are divided into two groups. On the one hand, individuals who express their religious preferences as Catholic, Protestant, Jewish, Muslim, Buddhist, Orthodox and other are included in the group called religious; on the other hand, people who report that they have no religious preferences are included in another group called non-religious. Descriptive Statistics is given in the table 4.3. Comparing the statistics of two different groups, we observe that individuals' level of well-being is slightly higher in the religious group than in the non-religious group. The percentage of individuals who donate to charitable organizations is higher in the religious group than in the non-religious group. In addition to that, religious individuals' donation (dummy) to both secular and non-secular charitable organizations is more than non-religious individuals' donation. On the other hand, the average of religious individuals' amount of donation is lower than the average of non-religious individuals'. Interestingly, individuals who report that they believe in a religion, have higher education levels. Besides, the average individuals' age in the religious group is higher than the average in the non-religious group. Racial characteristics with other characteristics of groups are nearly the same. Focusing on the religious group, we notice that Protestant individuals are the dominant in number.

The regression of the equation which includes both donations to secular and non-secular charities (as dummy variables) is done for both religious and non-religious groups. As illustrated in the figure, for non-religious individuals, contributing to charitable organizations does not have a significant effect on their well-being level, as seen in the third column of the table 4.4. Consistent with the first regression done with both donations to secular and non-secular charities, which can be seen in the first column, donation to

Table 4.3: Descriptive Statistics for Religious and Non-Religious Individuals

	Religious					Non-Religious				
Variable	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
SATISFACTION	6799	3.861597	.79631791	1	5	1264	3.759494	.81109	1	5
DONATION (DUMMY)	6799	.7380497	.4397281	0	1	1264	.5522152	.4974629	0	1
DONATION (AMOUNT)	6799	3494974	21392.88	0	703486	1264	9274715	7157873	0	102213
DON-SECULAR (DUMMY)	6799	.5781733	.4938875	0	1	1264	.4462025	.4972942	0	1
DON-NONSECULAR (DUMMY)	6799	.607001	.4884525	0	1	1264	.3148734	.4646493	0	1
HEALTH	6799	3.622297	1.011122	1	5	1264	3.595728	1.010012	1	5
MARRIED	6799	.7815855	.4132006	0	1	1264	.7333861	.4423638	0	1
GENDER	6799	.4730107	.4993078	0	1	1264	.5	.5001979	0	1
UNEMPLOYMENT	6799	.1511987	.3582688	0	1	1264	.1914557	.3936026	0	1
AGE	6799	46.71775	15.81619	17	95	1264	39.2318	14.47599	17	88
LOG(INCOME)	6799	1190556	.4082568	1115484	1566979	1264	1181567	.3833817	1115627	14015
WEALTH	6799	1426916	2526293	38001	1.02e+08	1264	1312283	2941396	661090	1.02e+08
HIGHSCHOOL	6799	.4450655	.4970096	0	1	1264	.4216772	.4940229	0	1
COLLEGE	6799	.4340344	.4956659	0	1	1264	.3844937	.4866679	0	1
RACEWHITE	6799	.8942492	.3075411	0	1	1264	.8955696	.3059391	0	1
RACEBLACK	6799	.0751581	.2636657	0	1	1264	.0704114	.2559403	0	1
RACEOTHER	6799	.0305927	.1722242	0	1	1264	.034019	.1813497	0	1
REL-CATHOLIC	6799	.2345933	.4237755	0	1	1264	0	0	0	0
REL-PROTESTANT	6799	.6598029	.4738101	0	1	1264	0	0	0	0
REL-OTHER	6799	.1056038	.3073524	0	1	1264	0	0	0	0

non-secular organizations is significant and also has a positive effect on the subjective well-being of the individuals who are in the group called religious, as demonstrated in the second column of the table. The same regressions are done with variables which indicates the amount of donation to secular and non-secular charitable organization instead of dummy variables. In accordance with the results in the table 4.4, individuals' self-reported well-being is positively correlated with their amount of donation to non-secular charities as illustrated in the first column of the table 4.5. In addition to that, religious individuals' level of well-being is correlated with their amount of donation to non-secular organizations. On the other hand, their contribution to secular organizations does not affect their subjective well-being. As illustrated in the third column, non-religious individuals do not receive utility from their amount of donation. In other words, their amount of donation to any kind of charitable organization does not affect their self-reported well-being.

Table 4.4: OLS Regressions for Religious and Non-religious People - With Don-Secular and Don-Nonsecular (dummy)

Variable	Organization Type	Religious Ind.	Non-religious Ind.
DON-SECULAR (DUMMY)	-0.00130 (0.0194)	-0.0101 (0.0210)	0.0449 (0.0502)
DON-NONSECULAR (DUMMY)	0.107*** (0.0193)	0.113*** (0.0209)	0.0426 (0.0506)
HEALTH	0.206*** (0.00907)	0.213*** (0.00983)	0.167*** (0.0235)
MARRIED	0.281*** (0.0221)	0.277*** (0.0243)	0.288*** (0.0543)
GENDER	-0.0475*** (0.0170)	-0.0560*** (0.0184)	-0.0136 (0.0442)
UNEMPLOYMENT	-0.103*** (0.0240)	-0.0839*** (0.0263)	-0.198*** (0.0581)
AGE	-0.0173*** (0.00317)	-0.0207*** (0.00344)	0.00107 (0.00879)
AGE2	0.000205*** (3.15e-05)	0.000238*** (3.38e-05)	1.63e-05 (9.41e-05)
LOG(INCOME)	0.0595** (0.0283)	0.0561* (0.0302)	0.0958 (0.0812)
LOG (WEALTH)	0.0818*** (0.0279)	0.0968*** (0.0968)	-0.0186 (0.0862)
HIGHSCHOOL	-0.0300 (0.0269)	-0.0407 (0.0301)	0.0150 (0.0615)
COLLEGE	-0.00174 (0.0293)	0.00474 (0.0326)	-0.0534 (0.0691)
RACEBLACK	-0.0230 (0.0328)	-0.0347 (0.0354)	0.0501 (0.0866)
RACEOTHER	0.0749 (0.0483)	0.0555 (0.0528)	0.179 (0.121)
REL-CATHOLIC	0.0826 (0.0290)		
REL-PROTESTANT	0.0511** (0.0246)		
REL-OTHER	-0.0759** (0.0353)		
Constant	2.036*** (0.291)	1.211*** (0.409)	2.022* (1.141)
Observations	8,063	6,799	1,264
R-squared	0.131	0.134	0.108

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.5: OLS Regressions for Religious and Non-religious People - With Don-Secular and Don-Nonsecular (amount)

Variable	Organization Type	Religious Ind.	Non-religious Ind.
LOG(DON-SECULAR (AMOUNT))	-0.00154 (0.00290)	-0.00447 (0.00313)	0.0106 (0.00766)
LOG(DON-NONSEC (AMOUNT))	0.0173*** (0.00271)	0.0196*** (0.00287)	0.00885 (0.00805)
HEALTH	0.205*** (0.00907)	0.212*** (0.00984)	0.166*** (0.0235)
MARRIED	0.278*** (0.0221)	0.277*** (0.0243)	0.286*** (0.0542)
GENDER	-0.0473*** (0.0169)	-0.0551*** (0.0184)	-0.0130 (0.0441)
UNEMPLOYMENT	-0.104*** (0.0239)	-0.0849*** (0.0263)	-0.201*** (0.0581)
AGE	-0.0174*** (0.00317)	-0.0200*** (0.00343)	0.000870 (0.00878)
AGE2	0.000205*** (3.15e-05)	0.000231*** (3.38e-05)	1.62e-05 (9.41e-05)
LOG(INCOME)	0.0531** (0.0286)	0.0425 (0.0304)	0.0837 (0.0816)
LOG (WEALTH)	0.0766*** (0.0280)	0.0876*** (0.0296)	-0.0309 (0.0816)
HIGHSCHOOL	-0.0300 (0.0269)	-0.0394 (0.0301)	0.0123 (0.0615)
COLLEGE	-0.00271 (0.0293)	0.000343 (0.0325)	-0.0611 (0.0691)
RACEBLACK	-0.0225 (0.0327)	-0.0288 (0.0352)	0.0524 (0.0868)
RACEOTHER	0.0755 (0.0483)	0.0297 (0.0524)	0.183 (0.121)
REL-CATHOLIC	0.0807 (0.0290)		
REL-PROTESTANT	0.0430* (0.0247)		
REL-OTHER	-0.0774** (0.0353)		
Constant	1.476*** (0.393)	1.509*** (0.417)	2.340** (1.166)
Observations	8,063	6,799	1,264
R-squared	0.133	0.137	0.108

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.1 Instrumental Variables Estimation and Selection on Unobservables Required to Explain the Donation Effect

4.1.1 Instrumental Variables Estimation

In the previous part of the estimation section of this study, I showed that there is a correlation between individuals' contributions to charitable organizations and their subjective well-being. To show that there is more than a correlation, namely a causal relation, between the act of giving and an individual's subjective well-being, an additional study is required. To put it differently, we need to show that the act of giving increases individuals' well-being, and not the other way around, namely that because they are happy they contribute to public goods. To address this endogeneity issue Videras and Owen (2006) suggest the instrumental variable technique. They look for a variable which is related to the social participation or contribution variable but not their dependent variable. In this respect, we need an instrumental variable which is correlated with the act of giving (i.e. the variable donation) but not correlated with the error term of well-being. For this reason, we search for a variable which is related to individuals' contribution but not to individuals' well-being, although it is very difficult task to find a factor of individuals which does not affect their subjective well-being level.

Cantor and Sanderson (1999), as well as Keser and Winden (2000) show that an individual's previous social participation is related to their present social participation. In this regard, contribution to the public good as a social participation of an individual in the present is related to previous contributions, but contribution to the public good in a previous year does not affect the subjective well-being of individuals today, because the question of life sat-

isfaction is asked annually to respondents and makes them consider the things that are happening that year. In addition to that, there is no obvious relation between individuals' donation which is made years ago and their current subjective well-being level. In other words, life satisfaction should be considered as a stock rather than a flow. For this reason, individuals' donations to charities from 2003, 2005 and 2007 of individuals are observed and if an individual donated any money to charities during these years a variable called *IVdonation03to07* is set to 1 and otherwise to 0. To show the validity of the instrument the two conditions must be satisfied: instrument exogeneity and instrument relevance. For the instrument exogeneity, it must be shown that the instrument is exogenous to error term ($Cov(IVdonation03to07, \epsilon) = 0$). A direct test of this condition is not possible, because it is not possible to find an unbiased estimator for ϵ to show that at least there is no obvious correlation between the instrument and the error term. As we discussed above, since we take the previous behaviour of individuals into consideration for the instrument, *IVdonation03to07*, we can conclude that there is strong evidence which indicates that the correlation is zero. For the instrument validity, it must be shown that the instrument must be correlated with the endogenous explanatory variable, donation ($Cov(IVdonation03to07, donation) \neq 0$). To show that there is a correlation between these terms, an OLS regression in which donation is a dependent variable and *IVdonation03to07* is one of the explanatory variables with other socio-economic and socio-demographic factors. Since the coefficient of the instrument is significant, as seen in the first column of the table 4.6, we can conclude that the second condition, instrument validity, is satisfied for this variable. With this new variable instrumental variable regression is done and the result of this regression can be seen in the second column of the table 4.6. As illustrated in the second column of the table, the variable is significant in IV regression. Therefore, with the instrumental variables technique I have demonstrated that the positive rela-

Table 4.6: IV Regressions and Instruments validities

Variable	Inst. Validity (DUMMY)	IV (DUMMY)	Inst. Val. (AMOUNT)	IV (AMOUNT)
DONATION03to07 (DUMMY)	0.253*** (0.0115)	0.409*** (0.0938)		
LOG-DONATION03to07 (AMOUNT)			0.0348*** (0.00975)	0.0402*** (0.00730)
HEALTH	0.0178*** (0.00473)	0.202*** (0.00931)	0.175*** (0.0331)	0.200*** (0.00925)
MARRIED	0.0785*** (0.0115)	0.282*** (0.0225)	0.595*** (0.0803)	0.280*** (0.0223)
GENDER	-0.0142 (0.0887)	-0.0323* (0.0177)	-0.0943 (0.0619)	-0.0380** (0.0173)
UNEMPLOYMENT	-0.0208*** (0.0125)	-0.101*** (0.0244)	-0.0816 (0.0874)	-0.106*** (0.0242)
AGE	-0.00527*** (0.00176)	-0.0377*** (0.00579)	-0.0756*** (0.0121)	-0.0307*** (0.00409)
AGE2	8.72e-05*** (1.70e-05)	0.000362*** (4.80e-05)	0.000947*** (0.000117)	0.000300*** (3.61e-05)
LOG (INCOME)	0.170** (0.0147)	0.0201 (0.0309)	1.470*** (0.103)	0.0111 (0.0304)
LOG (WEALTH)	0.0208 (0.0146)	0.0779*** (0.0284)	0.435*** (0.102)	0.0452 (0.0290)
HIGHSCHOOL	0.104*** (0.0141)	-0.0779** (0.0286)	0.451*** (0.0984)	-0.0552** (0.0278)
COLLEGE	0.224*** (0.0152)	-0.0312 (0.0316)	1.324*** (0.106)	-0.0380 (0.0310)
RACEBLACK	-0.0683*** (0.0171)	-0.00423 (0.0338)	-0.540*** (0.119)	-0.0164 (0.0330)
RACEOTHER	-0.00714 (0.0253)	0.102** (0.0496)	-0.0518 (0.177)	0.0909* (0.0489)
REL-CATHOLIC	0.0739*** (0.0151)	0.00680 (0.0296)	0.365*** (0.105)	0.00898 (0.0293)
REL-PROTESTANT	0.0804*** (0.0127)	0.0440* (0.0225)	0.645*** (0.0890)	0.0372 (0.0253)
REL-OTHER	0.0678*** (0.0184)	-0.0704** (0.0358)	0.474*** (0.129)	-0.0756** (0.0356)
Constant	-2.051*** (0.200)	2.209*** (0.459)	-21.34*** (1.431)	2.697*** (0.478)
Observations	8,063	8,063	8,063	8,063
R-squared	0.265	0.101	0.403	0.112

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

tion between contributions to public goods and an increase in the well-being of individuals is one-directional. In other words, individuals contribute and therefore their subjective well-being increases, not: they contribute because they feel happy. The same procedure is applied also for individuals' donation behaviour and we observe that there is also one-directional relation between individuals' amount of donation to charitable organizations and their own well-being.

CHAPTER 5

CONCLUSION

In this thesis, it is found that there is a positive relation between the donation amount and the reported well-being level. Consistent with the warm-glow theory, donation to the charitable organizations as an act is also positively associated with the subjective well-being of individuals. In this regard, we conclude that individuals receive utility from the act of giving in addition to their amount of donation. Our first finding is that the percentage of individuals who donate to charitable organizations is not small. By running simple OLS regressions, we show that there is a correlation between the act of giving and the subjective well-being level. In addition to that, there is also positive correlation between individuals' amount of donation and their own well-being. Moreover, by implementing the instrumental variables technique we find our first evidence to show that there is a one-directional effect between the act of giving and subjective well-being. In other words, individuals report a high level of well-being because they donate to charitable organizations. By using the instrumental variables technique we also showed that the amount of contribution to charitable organizations affects individuals' own well-being positively in a causal way. Since the instrument exogeneity condition cannot be shown empirically we need another piece of evidence to support our causality claim. For this reason, selection on observed and unobserved

variables method presented by Altonji et al (2005) is used. As a result, we demonstrate that, as one of the contribution of this study to the literature, there is a significant causal effect of donation on the subjective well-being of individuals. Therefore, individuals are not indifferent to their acts of giving and amount of contribution. In addition to that, I find that individuals are not indifferent to public goods to which they donate. We show that donation to secular organizations does not increase individuals' well-being, but, on the contrary, donation to non-secular organizations increases it. Lastly, individuals who report that they do not believe in a religion, do not get satisfied by their contribution to public goods.

BIBLIOGRAPHY

- Altonji, J.G., Elder, T.E., Taber, C.R. (2005). ‘Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools.’ *Journal of Political Economy*, Vol. 113, No. 1.
- (2008). ‘Using Selection on Observed Variables to Assess Bias from Unobservables when Evaluating Swan-Ganz Catheterization.’ *American Economic Review*, Vol. 98:2, pp. 345-350.
- Andreoni, James (1989). ‘Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence.’ *Journal of Political Economy*, Vol. 97, No. 6, pp. 1447-1458
- (1990). ‘Impure Altruism and Donation to Public Goods: A Theory of Warm-Glow Giving.’ *The Economic Journal*, Vol. 100, pp. 464-477.
- Brekke, K.A., Kverndokk, S. & Nyborg, K. (2003). ‘An Economic Model of Moral Motivation.’ *Journal of Public Economics*, vol. 87, pp. 1967-1983.
- Blanchflower, D.G. & Oswald, A.J. (2004). ‘Well-being over Time in Britain and the USA.’ *Journal of Public Economics*, Vol. 88, pp. 1359-1386.
- Carbonell, A.F & Frijters, P. (2004). ‘How Important is Methodology for the Estimates of the Determinants of Happiness?’ *The Economic Journal*, Vol. 114, pp. 641-659.
- Clark, A.E. & Oswald, A.J. (1994). ‘Unhappiness and Unemployment.’ *The Economic Journal*, Vol. 104, No. 424, pp. 648-659.
- Cantor, N. & Sanderson, C.A. (1999). Life Task Participation and Well-Being: The Importance of Taking Part in Daily Life. In *Well Being: The Foundations of Hedonic Psychology*. Ed. D Kahneman, E Diener, N Scharwz. New York: Russel Sage Foundation.
- Erhardt, J.J., Saris, W.E. & Veenhoven, R. (2000). ‘Stability of Life-Satisfaction over Time.’ *Journal of Happiness Studies*, Vol. 1.2, pp. 177-205.
- Eriksen, T.L.M, Nielsen, H.S. & Simonsen, M. (2012). ‘The Effects of Bullying in Elementary School.’ *IZA Discussion Paper*, No. 6718.
- Frey, B.S. & Stutzer, A. (2002). ‘What Can Economists Learn from Happiness Research?’ *Journal of Economic Literature*, Vol. XL, pp. 402-435..
- (2005). ‘Happiness Research: State and Prospects.’ *Review of Social Economy*, Vol. LXII, No. 2. - (2008). ‘Is Volunteering Rewarding in Itself?’ *Economica*, Vol. 75, pp. 39-59.

- Hungerman, D.M. (2008). 'Race and Charitable Church Activity.' *Economic Inquiry*, Vol 46.3, pp. 380-400.
- Keser, C. & Winden, F.V. (2000). 'Conditional Cooperation and Voluntary Contributions to Public Goods.' *The Scandinavian journal Economics*, Vol. 102.1, pp. 23-39.
- Knight, J, Song, L. & Gunatilaka, R. (2009). 'Subjective Well-being and Its Determinants in Rural China.' *China Economic Review*, Vol. 20(4), pp. 635-649.
- Koczan, Zs. (2013). 'Does Integration Increase Life Satisfaction?' *University of Cambridge Working paper*, No. 1314.
- Meier, S. & Stutzer, A. (2006). 'Is Volunteering Rewarding in Itself?' *Economica*, Vol. 75, pp. 39-59.
- Mullainathan S. & Bertrand, M. (2001). 'Do People Mean What They Say? Implications for Subjective Survey Data.' *American Economic Review*, pp. 67-72.
- Nunes, P.A.L.D & Schokkaert, E. (2001). 'Identifying the Warm Glow Effect in Contingent Valuation.' *Journal of Environmental Economics and Management*, Vol. 45, pp. 231-245.
- Oswald, A.J. (1997). 'Happiness and Economic Performance.' *The Economic Journal*, Vol. 107, pp. 1815-1831.
- Reinstein, David A. (2006). 'Does One Contribution Come at the Expense of Another? Empirical Evidence on Substitution Between Charitable Donations.' *In Repec Working Papers*, No. 618.
- Ribar, D.C. & Wilhelm, M.O. (2002). 'Altruistic and Joy of Giving Motivations in Charitable Behaviour.' *Journal of Political Economy*, Vol. 110, No. 2, pp. 425-45.
- Schoeni, Robert F. (2002). 'Does Unemployment Insurance Displace Familial Assistance?' *Public Choice*, Vol. 110, No.1-2, pp. 99-119.
- Sugden, Robert (1982). 'On the economics of philanthropy.' *ECONOMIC JOURNAL*, vol. 92, pp. 341-5.
- (1999). 'Public goods and contingent valuation.' In *Valuing environmental preferences. Theory and Practice of the Contingent Valuation Method in the US, EU and Developing Countries*. Ed. Bateman IJ, and Willis KG. Oxford University Press, pp. 131-51.
- Tella, R.D., MacCulloch, R.J. & Oswald, A.J. (2011). 'Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness.' *The American Economic Review*, Vol. 91, No. 1.
- VanderHoff, James (2012). 'Economic Diversity, Racial Diversity and Religious Contributions.' *Rutgers University Working Paper*, No. 2012-001.

Veenhoven, Ruut (1993). Happiness in Nations. *World Database of Happiness*, Washington USA.

Videras, J.R. & Owen, A.L. (2006). 'Public Good Provision and Well-Being: Empirical Evidence Consistent with the Warm Glow Theory.' *Contributions to Economic Analysis and Policy*, Vol. 5, Issue 1, Article 9.

APPENDIX

5.1 Using Selection on Observed Variables to Address Selection on Unobserved Variables

As we discussed in the previous section, on instrument exogeneity, testing the instrument's exogeneity to error term is not possible. Tests done by researchers do not reject the null hypothesis but this does not mean that the instrument exogeneity condition is satisfied. For this reason, the method presented by Altonji, Elder and Taber (2000) and used by Altonji, Elder and Taber (2008) and by Eriksen, Nielsen and Simonsen (2012) is also applied to our data to strengthen the case for the claim that donation has a causal effect on subjective well-being. They provide a method in which the information about selection on the observables is used for selection on the unobservables. They assume that the relationship between the explanatory variable (donation in our case) and the mean of distribution of the error term (the index of unobservable factors) that affect the dependent variable is the same as the one between donation and the mean of the element of observables factors ($X^\top$, in our study). After the differences in the variance of these distributions are also included, the condition becomes

$$\frac{E(\varepsilon|donation=1)-E(\varepsilon|donation=0)}{var(\varepsilon)} = \frac{E(X^\top\varsigma|donation=1)-E(X^\top\varsigma|donation=0)}{var(X^\top\varsigma)} \quad (3)$$

To test the causal effect of the donation on subjective well-being, the ratio of the left hand side of the equation to the right hand side is measured under the null hypothesis according to which α is 0 to account for the entire estimation of it. There are three strong assumptions included in this method. First, from the set of variables which determine donation and subjective well-being, observed variables are picked randomly. Second, none of the factors dominates the distribution of donation and subjective well-being because the number of both unobserved and observed factors is assumed to be too many. Third, as discussed above, the relationship between donation and the mean of distribution of the error term that affects the dependent variable is the same as the one between donation and the mean of the element of observables factors, $X^\top \varsigma$. Since a large-scale data set is used in this study, the first and the second assumptions are very logical and applicable. For this reason, Altonji, Elder and Taber (2005) declare that these two assumptions are better approximations to reality than OLS assumptions. For the third assumption, OLS and probit models assume that selection on unobservables is zero so that these models provide upper bound estimates. The assumption of OLS and probit models is different but as strong as the third assumption made in this method.

To find the effect of selection bias, the estimation of well-being is ignored and α is treated as it is estimated by a regression of the latent variable Y^* on X and donation. The predicted value and residuals of regression of donation on X are $X^\top \theta$ and $\widehat{donation}$. Thus,

$$donation = X^\top \theta + \widehat{donation} \quad (5)$$

$$SATISFACTION^* = \alpha \widehat{donation} + X^\top (\varsigma + \theta \alpha) + \epsilon \quad (6)$$

$\widehat{donation}$ is orthogonal to X and if the bias in OLS is applied to the formula above, then

$$plim \hat{\alpha} \simeq \alpha + \frac{cov(\widehat{donation}, \epsilon)}{var(\widehat{donation})}$$

$$plim\hat{\alpha} = \alpha + \frac{\widehat{var(donation)}}{\widehat{var(donation)}}[E(\epsilon|donation = 1) - E(\epsilon|donation = 0)] \quad (7)$$

Before implementing assumption 3, the equation 4, to the model above, we should restrict our sample to the data of individuals whose parents donate, because the effect of factors on the donation behaviour of individuals is weaker in this sub-sample. In this sample the gap between the value of factors when donations equal to one and zero is much lower than the gap for the full sample as seen in the table 4.6. Therefore, the factors used in our model lead to less selection than in the full sample. Focusing on this sample for the method of Altonji et al. (2005), $E(X^{\top}\zeta|donation = 1) - E(X^{\top}\zeta|donation = 0)$ can be used to calculate $E(\epsilon|donation = 1) - E(\epsilon|donation = 0)$ so that the bias can also be calculated. As Altonji, Elder and Taber propose, under the null hypothesis so that there is no effect of *donation* and so α is 0. The ratio $\hat{\alpha} \div \frac{\widehat{var(donation)}}{\widehat{var(donation)}}[E(\epsilon|donation = 1) - E(\epsilon|donation = 0)]$ is 0.231 shown in the table 4.7. The ratio of selection on unobservables relative to selection on observables is less than 1 in the case of donation to charitable organizations so that the act of giving has real effect on well-being of individuals. In this regard, another piece of evidence that supports the causal relation between the act of giving and subjective well-being is found. In the case of donation to non-secular organizations, the ratio is likely to be less than 1 so that part of the effect of the act of giving to non-secular organizations has an effect on subjective well-being which is probably real. In the light of this evidences, we can conclude that the act of giving has a causal effect on the subjective well-being of individuals.

Table 5.1: Effect of factors in Subsample and Whole Sample

	fdonation=1				Full Sample	
	fdonation=1				FULL SAMPLE	
	donation=1 (N=1106)	donation=0 (N=456)		donation=1 (N=5716)	donation=0 (N=2347)	
VARIABLES	mean	mean	difference	mean	mean	difference
healthstatus	3.92	3.81	0.11	3.69	3.44	0.25
married	0.76	0.50	0.26	0.82	0.65	0.17
gender	0.49	0.52	-0.03	0.47	0.48	-0.01
unemployment	0.12	0.17	-0.05	0.13	0.22	-0.09
age	37.59	32.31	5.28	48.11	39.30	8.81
agesquare	1511	1130	381	2558	1759	799
logincome	12.01	11.71	0.29	11.98	11.68	0.30
wealth	1367000	1094000	273000	1543000	1082000	461000
hsdegree	0.32	0.50	-0.18	0.41	0.52	-0.12
collegedegree	0.64	0.40	0.24	0.51	0.23	0.28
raceblack	0.02	0.04	-0.02	0.05	0.12	-0.07
raceother	0.01	0.02	-0.01	0.03	0.04	-0.01
religioncatholic	0.23	0.2	0.03	0.22	0.15	0.07
religionprotestant	0.56	0.48	0.08	0.57	0.52	0.05
religionother	0.08	0.09	-0.01	0.09	0.08	-0.01

Table 5.2: The Amount of Selection on Unobservables Relative to Selection on Observables in Order to Find the Effect of Donation on Selection Bias

Variable (1)	$(\hat{E}(X^{\top}\xi \text{donation} = 1) - \hat{E}(X^{\top}\xi \text{donation} = 0))$ $\div \hat{\text{Var}}(X^{\top}\xi)$ (2)	$\hat{\text{Var}}(\hat{\epsilon})$ (3)	$E(\epsilon \text{donation} = 1) -$ $E(\epsilon \text{donation} = 0)$ if the cond. holds (4)	$\frac{\text{Cov}(\epsilon, \text{donation})}{\text{Var}(\text{donation})}$ (5)	$\hat{\alpha}$ (6)	Implied Ratio (7)
donation09 (N=8036)	0.00035	727.02476	0.25727	0.25699	0.05239	0.20388
dontononsecular09 (N=8036)	0.007	4493.75907	30.072	0.0819	0.0987	1.167

Note: (1) ξ is estimated under the restriction α is equal to zero(2) $\hat{\alpha}$ is estimated by using the subsample.(3) The assumption 3, the equation 4, which implies that selection on unobservables is equal to the selection on observables, $\frac{E(\epsilon|\text{donation}=1) - E(\epsilon|\text{donation}=0)}{\text{var}(\epsilon)} = \frac{E(X^{\top}\xi|\text{donation}=1) - E(X^{\top}\xi|\text{donation}=0)}{\text{var}(X^{\top}\xi)}$.(4) Implied Ratio in the last column is the ratio of selection on unobs. to obs. under the hypothesis that α is equal to zero, there is no effect of act of giving.