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Time vs. money: The supply of voluntary labor and charitable donations across Europe

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ABSTRACT

Time vs. Money: The Supply of Voluntary Labor and Charitable Donations across Europe^{*}

Volunteering plays a prominent role in the charitable provision of goods and services, yet we know relatively little about why individuals spend time and money to the charity. Assuming that volunteering is a consumption good, we analyze the determinants of individuals' charitable cash donations and volunteer labor as well as the interdependence between both goods. Using data from the European Social Survey, we find a positive relationship between time and money contributions on the individual as well as on the country level. The hypothesis that time and money donations are gross complements, however, is not supported by our analysis, as we find evidence that individuals substitute time donations by money donations as the price of time raises. Analyzing philanthropic behavior on a disaggregated level reveals large differences in the determinants and the relationship of time and money donations – both across different types of voluntary organizations and across different welfare regimes.

JEL Classification: H41, J22, L31

Keywords: private philanthropy, charitable contribution, voluntary organizations

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1 Introduction

Volunteering is often regarded as being fundamental for the sustainability of civil society. In order for non-profit organizations to exist and to be effective, individuals who voluntarily contribute to these organizations are required. The literature on why people participate in voluntary organizations is rich. Researchers from several disciplines, including social scientists, psychologists, political scientists and economists, have tried to understand the volunteering phenomenon. Most of these studies have focused on the explanation of voluntary labor supply (for reviews, see Smith, 1994; Wilson, 2000), while the supply of charitable contributions of money is widely disregarded. These analyses ignore that there are two ways of contributing to the charity – spending time or spending money – and that the decision on which way of charitable contribution to choose is not independent of each other.

Understanding the interdependence between voluntary labor supply and charitable donations, however, is important for policies intending to increase the support of non-profit organizations. If, for example, charitable contributions of time and money represent gross substitutes, policies aiming for an increase in voluntary labor supply will result in a reduction of revenues from donations. Motivating their analysis by a private consumption model, Menchik and Weisbrod (1987), Schiff (1990), and Brown and Lankford (1992) estimate price and income elasticities for individuals' charitable cash donations and volunteer labor. Using an individual's net wage as the price of voluntary labor supply and one minus an individual's marginal tax rate as the price of money donations, they find negative price and cross-price elasticities for volunteer labor. Their results indicate that charitable gifts of time and money are gross complements.

Furthermore, most existing studies treat charitable behavior as a homogeneous commodity and do not allow the determinants of volunteering, as well as the relationship between contributions of time and money, to vary by the type of voluntary organization. Segal and Weisbrod (2002) address this issue by estimating and comparing volunteer labor supply in three sectors that rely on voluntary labor: health, education, and religious organizations. They conclude that differences in the marginal volunteer labor supply effects are associated with personal demographics, household composition, and tax status.

Finally, the vast majority of existing studies on voluntary labor as well as money donations concentrates on a single country – the US. Empirical evidence for other countries as well as cross-country comparisons with respect to the determinants of time and money donations are missing in the literature. Those researchers that have been interested in understanding cross-national aspects of philanthropic behavior have focused their attention on explaining voluntary labor supply, while charitable cash donations are disregarded. Furthermore, they used primarily a sociological approach in order to explore how specific country-level contextual factors relate to volunteering (see, e.g., Salamon and Anheier, 1998; Curtis *et al.*, 2001; Parboteeah *et al.*, 2004). These analyses, however, ignore that cross-country variation in volunteering rates might not only be attributed to differences in cultural or institutional factors, but also be driven by

differences in individual determinants of charitable behavior.

This paper contributes to the existing debate on the determinants of philanthropic behavior by analyzing the determinants of individuals' charitable cash donations and volunteer labor as well as the interdependence between both goods. By using data from the European Social Survey (ESS), which includes representative survey data of individuals from 19 countries, we are further able to examine the determinants of volunteering across countries with different welfare regimes. Moreover, the data contain detailed information on the type of voluntary organization individuals take part in, which enables us to analyze philanthropic behavior across different types of voluntary organizations.

The outline of the paper is as follows. Section 2 introduces the economic theory explaining individual decision making with respect to charitable contributions of time and money. The underlying data are presented in section 3, along with a descriptive analysis of volunteering across Europe. In section 4, the method used in the empirical analysis is described and estimation results are discussed. Section 5 concludes.

2 Theoretical Framework

Following, amongst others, Menchik and Weisbrod (1987) and Brown and Lankford (1992), philanthropic behavior is explained using the private consumption model as a framework. In this model, each individual is endowed with T units of time, which can be partitioned into working time t^m , leisure time t^l and volunteer time t^v , i.e., $T = t^m + t^l + t^v$. Individual preferences are described by the utility function $U(C, t^l, G)$, which is assumed to be quasi-concave and increasing in all goods, and where C refers to private consumption and $G(t^v, D)$ to voluntary contributions toward the public good. In contrast to the public goods model (see, e.g., Bergstrom *et al.*, 1986; Duncan, 1999), the individual's voluntary contributions G directly enter its utility function, whereas the total supply of the public good does not affect individual utility.

G is produced by two inputs, charitable contributions of time, t^v , and charitable contributions of money, D . Each individual chooses combinations of private consumption, leisure, volunteer labor, and money donations that solve the utility maximization problem:

$$\max U(C, t^l, G(t^v, D)) \tag{1a}$$

$$s.t. C + D = w t^m + Y \tag{1b}$$

where w refers to the wage rate for market work and Y to non-wage income.¹ Within this

¹Menchik and Weisbrod (1987) and Brown and Lankford (1992) further incorporate the marginal tax rate into their model, which constitutes the price of charitable contributions of money and the cross-price of charitable contributions of time. In the ESS data, however, information on individual tax rates is not available. As a

framework, both contributions of time t^v and contributions of money D are treated as normal goods. As such, volunteering should behave like other sources of utility, increasing as income rises. Moreover, the amount of time volunteered decreases as its opportunity costs rise. It can further be shown that the marginal rate of substitution between volunteer labor and volunteer giving is equal to the wage rate (see Appendix A). Hence, the model predicts that individuals substitute time donations by money donations as the wage rises.

According to the theoretical model, the wage rate appears to be an important variable in determining voluntary labor supply, because it equals the individual's opportunity costs of time if one assumes that hours of work are fully flexible. However, if labor markets are imperfect and hours of work constraint, the wage is no longer measuring the opportunity costs of a marginal hour of time (Brown and Lankford, 1992; Schiff, 1990). To address this problem, Clotfelter (1985) models the time allocation problem as being sequential, i.e., he assumes that individuals decide on their hours of work prior to making decisions on volunteering. Under this assumption, the individual's working hours becomes the theoretical relevant variable in determining voluntary labor supply. The same argument is put forward by Brown and Lankford (1992), who use the number of available hours (i.e., the difference of total hours and working hours) instead of the wage rate as a measure of an individual's virtual price of time. We follow these argumentations and use the individual's hours of work to measure the effect of the opportunity costs of time on the decisions to donate time and money, respectively.

In contrast to the public goods model, which predicts donations of time and money to be perfect substitutes in increasing the supply of the public good, the private consumption model provides no clear prediction concerning the relationship between both goods. By assuming that individuals derive a private benefit from volunteering, the model allows time and money to be donated for different reasons. If, for instance, individuals benefit from working voluntarily, because they enjoy the prestige associated with volunteering or the interaction with others, they may give time even if money donations are a less costly way of contributing to the charity (Schiff, 1990). Hence, individuals may give both time and money, allowing the relationship between both goods to be complementary.

While the model does not provide a strong prediction on the relationship between time and money donations, it permits the relationship between both goods to vary over voluntary organizations. In this context, Schiff (1990) stresses the importance of a volunteer's influence over the actions of a charitable organization. As he states, individuals may not only be interested in increasing the output of a charity, but have specific preferences over the output type provided by the organization. Assuming that influence over the output type (or "philosophy") of the charity is more easily obtained by volunteering than by donating money, volunteer jobs or organizations that involve greater influence will be less substitutionary with money donations than other types of volunteer activities.

consequence, we disregard taxes in both the theoretical model and the empirical analysis.

The assumption that individuals derive utility from helping others *per se*, i.e., they receive a “warm glow” (Andreoni, 1990) from contributing to the provision of a public good, might be an oversimplification of the motivation behind charitable behavior. Some individuals might volunteer because they expect external benefits or payoffs from their contribution. This extrinsic motivation to volunteer has been theoretically funded by Menchik and Weisbrod (1987). According to their investment model of voluntary labor supply, individuals engage in voluntary organizations only to raise potential labor earnings. However, since the investment model does not provide clear predictions on price and income effects related to charitable contributions of time and money, knowledge of these effects does not permit to empirically discriminate between consumption and investment motives. For this reason, we do not explicitly distinguish between a consumption and an investment model. Rather, we treat investment motives as a special case of utility maximizing (consumption) motives.

3 Data and Empirical Strategy

The data used in the following analysis is taken from the first round of the ESS, a multi-country repeat cross-sectional survey funded jointly by the European Commission, the European Science Foundation and academic funding bodies in each participating country. The central aim of the ESS is to gather data about people’s social values, cultural norms and behavioral patterns within Europe. The first round of the ESS was fielded in 2002/2003. Up to now, five waves are available, covering a total of 33 nations. The survey consists of two elements – a basic interview questionnaire conducted in every round and a supplementary questionnaire devoted to specific topics, which changes over time. In the first round of the ESS, the supplementary file contains detailed information on voluntary organizations individuals take part in. In this file, every respondent is asked about his participation in 11 distinct voluntary organizations, as, e.g., religious organizations, humanitarian organizations or political parties. Respondents provide information on whether they (i) were involved in voluntary work or (ii) donated money to any of these types of organizations within the last 12 month. In the sample we use for our analysis, 17.9% of the individuals worked voluntarily and 26.8% gave money to at least one voluntary organization.

In the first part of the analysis, we disregard information on the kind of organization and investigate the determinants of participating in voluntary labor and donating money, respectively, on an aggregate level. In a second step, we distinguish between 4 types of organizations, namely (i) social organizations, (ii) leisure activity organizations, (iii) work-related and political organizations, and (iv) religious organizations.²

Analyzing philanthropic behavior on a disaggregated level is meaningful in many respects. As Menchik and Weisbrod (1987) point out, individuals may engage in voluntary organizations

²The allocation of organizations to either of these categories is displayed in Table B1 in the Appendix.

to raise potential labor earnings. The opportunities to augment ones earnings potential may vary across different types of voluntary organizations. For example, being member of a science organization might be more fruitful to raise labor earnings than engaging for a religious organization. However, even in a purely consumption-based framework differences in voluntary organizations are likely to occur, since the utility derived from contributing to the charity might vary over different types of voluntary programs. Lastly, as argued by Schiff (1990), the rate of substitution between donating time and money might vary over the organization type.

According to the theoretical model, our outcomes of interest are an individual's charitable contributions of time, t^v , and his charitable contributions of money, D . Letting v_{ij1}^* represent the amount of time individual i in country j spends volunteering and v_{ij2}^* the amount of money individual i in country j donates to the charity, we yield the following regression model:

$$v_{ijk}^* = \alpha'_k t_{ijk}^w + \beta'_k Y_{ijk} + \gamma'_k X_{ijk} + \sum_{j=2}^m \delta_{jk} c_{ijk} + \epsilon_{ijk}, \quad (2)$$

$$k = 1, 2; j = 1, \dots, m; i = 1, \dots, N,$$

where the vectors t_{ijk}^w and Y_{ijk} represent an individual's working time and household income, respectively, while X_{ijk} is a vector of explanatory variables described in more detail below. The c_{ijk} 's refer to country fixed effects. Since v_{ij1}^* and v_{ij2}^* are likely to be correlated, the errors terms ϵ_{ij1} and ϵ_{ij2} are defined as follows:

$$\begin{pmatrix} \epsilon_{ij1} \\ \epsilon_{ij2} \end{pmatrix} \sim N \left(\begin{pmatrix} 0 \\ 0 \end{pmatrix} \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix} \right),$$

i.e, we allow ϵ_{ij1} and ϵ_{ij2} to be correlated via ρ . Estimates of ρ show whether time and money donations are positively related ($\hat{\rho} < 0$), negatively related ($\hat{\rho} > 0$), or independent goods ($\hat{\rho} = 0$).

In the ESS data, an individual's charitable contribution of time and money cannot be observed. We only observe whether contributions of time and money are made or not. Hence, instead of the latent variables v_{ij1}^* and v_{ij2}^* , we observe

$$v_{ijk} = \begin{cases} 1 & \text{if } v_{ijk}^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

In order to consistently estimate the parameters of the regression model described by equation (2), a bivariate probit model is applied in the empirical analysis.

We estimate robust standard errors in all models. In order to ensure representativeness, we further use design and population weights in all regressions. While the design weight corrects for different selection probabilities of individuals within each country, the population weight ensures that each country is represented in proportion to its actual population size.

As outlined above, our variables of main interest are hours of work, t_{ijk}^w , and household income, Y_{ijk} . In order to fully capture an individual's opportunity costs of time, we use an individual's total working hours, including paid or unpaid overtime, instead of its contracted working hours as our measure for the virtual price of time.³ Based on a descriptive analysis of the relationship between working hours and participation in voluntary organizations, working hours are not added as a continuous variable but subdivided into 5 categories in order to allow for a non-linearity relationship between the two variables. I.e., we added dummy variables for those working (i) 0 hours (not employed), (ii) 1-20 hours, (iii) 21-35 hours, and (iv) more than 45 hours, while those with a standard work week of 35-45 hours serve as a reference category.⁴

Assuming volunteering to be a normal good, the theoretical model predicts the probability of donating time and money to increase in income. The ESS data contain information on monthly household income, capturing both labor and non-labor income. We adjust this income information in the following ways: Since household income is not a continuous variable but is subdivided in predefined income categories, we set income equal to the mid-point of each interval and to the lower bound of the top interval. In order to achieve comparability across countries, we multiply income by the country-specific purchasing power parities for the years 2002 and 2003, respectively, depending on the year the interview took place. Since household income should serve as an indicator for the available income of an individual, it is further divided by the equivalized household size.⁵ As the marginal utility of volunteering should diminish as income raises, we model volunteering as a quadratic function of income.

Additional control variables included in the vector X_{ijk} comprise the individual's age (2 categories) and his highest level of education (primary, secondary or tertiary education). We further add indicator variables for whether the person is female, whether she is an immigrant, whether she belongs to a religious denomination, and whether she lives with a partner as well as variables capturing the number of household members and the presence of children aged 0-5 and 6-12, respectively, to the specification. Lastly, we include information on the place of residence, i.e., we control for population density.

To allow for differences in philanthropic behavior across countries, which might, e.g., arise from differences in culture or institutional settings between the countries, we include country fixed effects in all regressions. However, the ESS data do not only allow cross-country comparisons, but also contain information on the individual's region of residence within each country. Since countries were subdivided according to the NUTS-standard (European Commission, 2007), the official division of the EU for regional statistics, we were able to assign the respective NUTS-level to each of the regions reported. By means of these NUTS-levels, the following regional indicators provided by Eurostat are merged to the data: (i) the regional

³Using only contracted working hours yielded similar results.

⁴We also tested finer categorizations of the working hours variable. However, they did not substantially alter the estimation results.

⁵The equivalized household size is calculated by assigning the first household member a weight of 1, any other adult household member a weight of 0.5, and any child under the age of 16 a value of 0.3.

unemployment rate for individuals aged 15 and older, (ii) female labor force participation for women aged 15 and older, and (iii) GDP as percentage of the EU average. These indicators allow us to identify whether – given the countries’ culture and institutions – economic circumstances do have an impact on the individual’s decision of whether to volunteer and/or spend money to the charity.

In the first wave of the ESS, 22 countries are surveyed, namely the EU-15, the Czech Republic, Hungary, Israel, Norway, Poland, Slovenia, and Switzerland. Due to missing information on specific variables, some countries have to be excluded from the empirical analysis. For Switzerland and the Czech Republic, survey questions on participation in voluntary organizations are not comparable to the other countries and have therefore been omitted. In Israel, household income is measured in income categories of national currency and is therefore not comparable to the income information of the other countries. Due to a change in NUTS-codes over the observation period, regional indicators are not available for Denmark and Finland. For Norway, data on regional GDP are missing. Hence, these countries have also to be excluded when estimating the specifications that include regional indicators. Therefore, we end up with 19 and 16 countries, respectively, which we can use for our empirical analysis. On the individual level, we restrict our sample to persons being of working age (i.e., age 16 to 65). Excluding observations with missing information on at least one of the variables used leads to a final sample of 22,756 individuals (18,548 if including regional indicators).

Table 1 shows the philanthropic behavior of the individuals in our sample by type of the non-profit organization. Overall, almost 18% of the individuals supply voluntary labor and 27% donate money to non-profit organizations. 11% of the individuals supply voluntary labor to organizations that are connected to leisure activities such as sports clubs or cultural and hobby activity organizations. Almost 7% work voluntarily for social organizations, about 5% for work-related and political organizations and only 3% for religious organizations. The picture appears to be somewhat different if it comes to money donations. While 17% of the individuals in our sample give money to social organizations, about 10% do so for organizations that are associated with leisure activities, and about 7% donate money to work-related and political organizations and religious organizations. Overall, Table 1 suggests that individuals are more likely to donate money than to supply voluntary labor to all types of non-profit organizations despite those who are associated with leisure activities.

Figure 1 shows the percentage of individuals participating in charitable organizations – either by working voluntarily or by donating money – across countries. In all countries but Hungary, the proportion of individuals spending money is higher than the proportion providing voluntary work. In Austria, Spain, Portugal, and Italy the difference between both rates is exceedingly high, with the share of money donors being more than twice as large as the share of voluntary workers. Overall, a positive relationship between a country’s participation in voluntary work and charitable giving emerges. The correlation coefficient between both rates

amounts to 0.857, indicating a complementary relationship between time and money donations at least at the country level.

With the exception of Finland, the Scandinavian countries and the Netherlands exhibit the highest share of people being active in charity, while the Mediterranean countries as well as Hungary and Poland show the lowest ones. A possible interpretation for those nations with low membership rates is that, regardless of religious, political, or economic factors, societies characterized by extended family systems may be lower in voluntary association activity than societies without this characteristic (Curtis *et al.*, 2001). This argumentation is in line with the findings of Reher (1998), whose analysis of family ties across societies shows a “dividing line” between southern European societies, with their history of depending on strong and extended families to care for the elderly and the poor, versus northern European and North American societies, with their weaker family systems and greater reliance on public and private organizations to provide social assistance.

The low frequency of volunteers among Eastern European countries may be explained by changes in the infrastructure of volunteering during transformation. As Meier and Stutzer (2008) state, a high proportion of volunteers stopped their volunteer work due to the termination of groups and organizations which previously provided opportunities for civic engagement, i.e., societal mass organizations or publicly owned firms. Another argument is put forward by Plagnol and Huppert (2010), who argue that enforced volunteering during Soviet times may have replaced people’s intrinsic motivation to volunteer. However, since individual characteristics are not controlled for, cross-country differences in charitable activity might purely be driven by differences in the socio-economic structure of the populations in the different countries.

4 Empirical Results

Aggregate volunteering

Table 2 shows the results of the bivariate probit estimation for the determinants of participating in voluntary labor and donating money, respectively, disregarding information on the kind of organization for which volunteering occurs. Corroborating the assumption of volunteering to be a normal good, household income is positively correlated with both the individual’s probability of donating time and his probability of donating money. However, the marginal effect of an additional euro of household income on volunteering decreases with income.⁶

With respect to hours of work, the results show that – except for those who are not employed – individuals who work less than 35 hours have a higher probability of working voluntarily for a non-profit organization than those with a standard work week, indicating that voluntary labor supply indeed decreases as the opportunity costs of time rise. However, those who work more than 45 hours a week do not differ from those with a standard work week. Regarding

⁶For both voluntary labor and giving, the point of return is beyond our observed range of values.

the relationship between hours of work and money donations, those with 0 working hours (i.e., those who are not employed) are found to show the lowest probability of donating money to the charity, while those working more than 45 hours a week show the highest probability of doing so. This finding might serve as an indicator for a substitutionary relationship between time and money donations, suggesting that the probability that time donations are substituted by money donations increases as the price of volunteer time raises. However, the result may also be driven by differences in unobservables between non-employed individuals and those with exceedingly high working hours. For instance, an individual's unobserved motivation or conscientiousness might affect both his work effort and his pro-social behavior. Moreover, the effect of working hours might partly capture the impact of wages on the decision to spend money to non-profit organizations. Although controlling for household income should capture an individual's financial ability to donate money to the charity, it might make a difference on who in the household earns the money and therefore decides on spending it to the charity.

Regarding the other covariates, women are found to have a significantly lower probability of working voluntarily than men, while men and women do not differ in their probability of spending money.⁷ Individuals aged 46 to 65 show a significantly higher probability of donating time and money to the charity than middle-aged individuals. This finding is contradictory to the predictions of the investment model of volunteering (Menchik and Weisbrod, 1987), which hypothesizes that individuals should invest early in life in volunteering in order to maximize the returns of this investment.

The results of the other covariates are in line with previous literature (e.g., Menchik and Weisbrod, 1987; Freeman, 1997; Meier and Stutzer, 2008). The probability of donating time and money is increasing with the individual's level of education. Immigrants have a significantly lower probability of working for the charity, which is in accord with the existing literature on social integration, showing that immigrants are at a higher risk of being socially excluded with respect to social and political participation in general (see, e.g., Tsakloglou and Papadopoulos, 2002). Conforming existing research on the relationship between religiosity and volunteering (see, e.g., Curtis *et al.*, 2001; Ruiter and de Graaf, 2006), which suggests that church members are more likely to be involved in voluntary organizations than non-members, individuals belonging to a religious denomination show a higher probability of working voluntarily and spending money. Since religious organizations are among the dominant voluntary organizations in most European societies (Gaskin and Smith, 1995), this does not mean that religious involvement boosts volunteering in general. Rather, religious people might simply be more likely to volunteer for religious organizations.

While individuals with a partner in the household do not differ from singles, the number of household members is positively correlated with the probability of working for a voluntary organization. However, in the presence of small children (aged 0 to 5) in the household

⁷To allow for differences in the determinants of private philanthropy between men and women, we further estimate equation (2) separately by sex. Results are shown in Table B3 in the Appendix.

the probability of engaging in voluntary work decreases, while it increases in the presence of school-aged children (aged 6 to 12). This may simply reflect that parents are increasingly voluntarily involved in the school or a sports club as children grow older in order to support their development.

Regarding the degree of urbanization, the probability of donating time is the highest for individuals living in thinly populated areas, while the probability of donating money is the highest for those living in densely populated areas. Ziemek (2006) explains higher volunteering rates in rural areas by a lack of public goods and services in these regions, suggesting higher levels of altruism. A further explanation might be that prestige associated with volunteering as well as the chance of being asked to volunteer⁸ is higher in rural environments. The higher the degree of urbanization and anonymity, respectively, the higher the chance that people substitute donating time by donating money.

The estimation results from Model (2), including regional economic indicators, are shown in columns 4 and 5 of Table 2. Although one could argue that high unemployment and low female labor force participation, respectively, means a high unused labor capacity potentially being available for the non-profit sector, both factors are uncorrelated with voluntary labor supply. However, the higher local unemployment, the lower the probability that an individual spends money to the charity, suggesting that rather than having a direct impact on volunteering, local unemployment operates through an indirect (negative) income effect. Regional GDP, which should be positively correlated with the residents' probability of spending money to voluntary organizations, has no statistically significant effect on voluntary labor and giving. The effects of the other covariates are hardly affected by the inclusion of regional indicators.⁹

The estimated $\hat{\rho}$'s reported in the bottom of Table 2 provide information on the relationship between time and money donations in general. For both specifications, $\hat{\rho}$ is positive and significantly different from zero, indicating a positive relationship between an individual's decision to volunteer time and his decision to volunteer money. This suggests that there are unobserved characteristics, such as an individual's altruistic behavior in general or its valuation of the private provision of public goods, that determine whether a person contributes to the charity or not. A second explanation might be that individuals providing voluntary work have more information about the organization they are working for and thus have a higher probability of donating money than non-volunteers with the same characteristics but less information (Freeman, 1997; Schiff, 1990).

Disaggregate volunteering

As outlined above, the factors driving philanthropic behavior might vary over voluntary orga-

⁸The relevance of being asked to volunteer in explaining volunteer labor supply is stressed by Freeman (1997), who finds that a large proportion of individuals volunteers in response to a request to do so.

⁹In order to assess whether the effects of the other covariates are robust to the inclusion of regional indicators, we also estimated Model (1) excluding individuals from Denmark, Finland and Norway. The results are similar to those of Model (2). Estimation results are available from the authors upon request.

nizations. Since we have information on the type of organization individuals spend time and money for, we are able to address this issue by estimating the model separately by type of organization. We distinguish between four types of organizations, namely (i) social organizations, (ii) leisure activity organizations, (iii) work-related and political organizations, and (iv) religious organizations. The estimation results are reported in Tables 3.1 and 3.2.

Overall, the hypothesis of equality of all parameters, including the intercepts and the error variances, across the four types of organizations was rejected.¹⁰ With respect to our variables of main interest, total income and the opportunity costs of time, we find large differences between the different types of voluntary organizations. Although the consumption model predicts volunteering to increase with total income, this does not hold true in case of labor supply to organizations associated with leisure activities and religious organizations, which appears to be uncorrelated with income. This result is partly consistent with Segal and Weisbrod (2002), who find that increased household income increases the amount of volunteer time supplied to health organizations, but has no effect on volunteering for religious organizations.

With respect to working hours, our measure of an individual's virtual price of time, we find evidence for a negative relationship between hours of work and the probability of working voluntarily for a non-profit organization for all types of organizations except for work-related and political organizations. For the latter, we rather observe a U-shaped relationship between hours of work and voluntary labor supply, i.e. both part-time workers (1-20 hours) and those working more than 45 hours show a significantly higher probability of spending time to these organizations than those with a standard work week. This result is consistent with Freeman (1997), who finds a U-shape relationship between hours of work and volunteer time, albeit not distinguishing between different types of organizations. The finding that individuals who work long hours in the market also show a high probability of actively engaging in voluntary work suggests that something more than an individual's valuation of time underlies his decision to spend time to the charity. One interpretation of this result is that individual differences, be it tastes, motivation, or ability, overwhelm the negative relationship between opportunity costs and voluntary labor supply. The fact that the positive relationship between working long hours and working voluntarily for a non-profit organization does only exist for work-related organizations does further lend support to an investment motive of volunteering, suggesting that individuals spend time to these organizations in order to invest in their human and/or social capital and thereby raise their future earnings potential.

Concerning the relationship between hours of work and money donations, large differences across organization types appear. The overall finding that individuals who work more than 45 hours a week are more likely to donate money to the charity than those who work standard hours does only hold true for social and leisure activity organizations. Taken by itself, this result might serve as an indicator for a substitutionary relationship between time and money donations

¹⁰Rejection is based on χ^2 -test statistics with 63 degrees of freedom of 1032.6 and 1496 for the labor and donation equations, respectively.

for these organizations. However, the results also show that those who work 1 to 20 hours and 21 to 34 hours, respectively, have an increased probability of supporting these organizations financially, indicating a U-shaped relationship between hours of work and money donations to these organizations. In case of work-related and political organizations, we find that those who are not working for pay show a significantly lower probability of spending money to these organizations as compared to those working 35 to 45 hours. This result is quite intuitive, as it simply reflects that individuals who are not employed have less information or even limited access to such organizations and are therefore less likely to support them financially. All other groups of workers do not significantly differ from full-time employed individuals (35-45 hours) with respect to their likelihood of donating money to work-related organizations.

Overall, the results show that for none of the four types of voluntary organizations a distinct positive or a distinct negative relationship between hours of work and money donations exists, which makes it difficult to draw any definite conclusions regarding the relationship between time and money donations. However, what we conclude from this finding is that we do not find evidence for a complementary relationship between time and money donations, although we find a large positive correlation between the probability of spending time and the probability of spending money to any of these organizations. This positive relationship between an individual's decision on whether to donate time and his decision on whether to donate money is most prevalent among religious organizations ($\hat{\rho} = 0.77$, as compared to $\hat{\rho} = 0.55$ for overall volunteering). This suggests that unobserved characteristics that select individuals into volunteers and non-volunteers play a decisive role regarding volunteering in a religious context.

While charitable engagement increases with age and education in all organization types considered, there are also remarkable differences in the socio-demographic factors associated with time and money donations to the different types of voluntary organizations. Women are more likely to engage in social organizations and less likely to engage in leisure activity and work-related/political organizations than man. Immigrants are significantly less likely than natives to work voluntarily for leisure activity and work-related/political organizations, while there are no statistically significant differences between immigrants and natives concerning labor supply to other organizations as well as concerning money donations. Again, this may indicate a lack of social integration of immigrants. Church membership is found to not only increase an individual's involvement in religious organizations, but is positively correlated with participation in secular organizations as well. Ruiter and de Graaf (2006) explain this "spillover effect" by the fact that people who are already involved in religious volunteering are more likely to communicate with people who volunteer for non-religious organizations. Hence, corresponding to network theory, their chance to volunteer for secular organizations should be high as well. For all organizations but social organizations, the probability that an individual participates in charitable activities increases with household size. While the presence of small children significantly reduces voluntary engagement in all types of organizations despite religious organizations, the

presence of 6 to 12 year old children increases the supply of voluntary labor to organizations associated with leisure activities as well as work-related and political organizations. Finally, it turns out that the overall finding of money donations being most frequent in densely populated areas is solely driven by donations to social organizations, while pecuniary contributions to any other charitable organization are independent of the degree of urbanization.

Adding controls for regional economic indicators (Table 3.2) shows that a high local unemployment rate lowers the probability that individuals donate time or money to organizations associated with leisure activities, while participation in any other voluntary organization is unaffected by local unemployment. Moreover, we find that higher regional GDP increases the probability of money donations to work-related and political organizations. While these differences in the relationship between local economic factors and charitable contributions across organization types might be explained by differences in individual preferences, regional variation in the demand for volunteers might also play a role. Economically underdeveloped regions might lack in the public and private provision of organizations such as cultural institutions or sports clubs, while the infrastructure of profession and science organizations might be particularly high in prospering areas.

Cross-country variation

Up to this point, charitable behavior has solely been analyzed on the individual level. However, several aspects concerning country level evidence might also be of interest: How much of the cross-country variation in volunteer rates can be explained by individual characteristics? Are there differences between the countries concerning the determinants of individual decision making toward volunteering? And lastly, does the relationship between time and money donations vary across countries?

In order to address the first question, we estimate our aggregate model excluding the country fixed effects and calculate predicted probabilities of spending time and money for each individual. The mean values of these predictions for each country are presented in Figure 2. When excluding country fixed effects, the mean of predicted probabilities of donating time and money varies only slightly over countries. The predicted rate of voluntary labor ranges from 12.1 percent for Portugal to 22.0 percent for Norway, while the actual range is from 5.1 to 38.2 (see Figure 1). Regarding the predicted share of voluntary donors by country, values range from 20.2 percent (Portugal) to 33.3 percent (Great Britain), as compared to the actual value range of 6.2 (Hungary) to 46.3 (Sweden).

There are two potential explanations for this result: (i) the observed differences in volunteering rates between the countries may arise from differences in the institutional or cultural background between the countries; (ii) the individual factors associated with volunteering might vary over countries. In order to test the second argument, we estimate our aggregate model

of volunteering separately by country group.¹¹ We group countries according to a modified Esping-Andersen welfare regime typology (Esping-Andersen, 1990), which was suggested by Bonoli (1997). Bonoli’s typology is based on a two-dimensional approach that classifies countries according to the “quantity” and the “quality” of welfare provision. While the former corresponds to the level of expenditure on social welfare, the latter refers to the coverage by social protection among the whole population.¹² We choose this typology since we believe welfare provision to be highly relevant with respect to the individual provision of public goods. Although public goods theory predicts that government spending crowds-out voluntary contributions (cf. Warr, 1982; Roberts, 1984; Bergstrom *et al.*, 1986), cross-national studies have shown a positive relationship between countries’ social expenditure and national rates of volunteering (e.g., Gaskin and Smith, 1995; Salamon and Sokolowski, 2003).

According to Bonoli’s classification, we distinguish between four types of welfare states: (i) high spending/high coverage countries, i.e., Denmark, Finland, Norway and Sweden (referred to as Scandinavian countries), (ii) high spending/low coverage countries, i.e., Austria, Belgium, Germany, France, Luxembourg, and the Netherlands (referred to as Continental countries), (iii) low spending/high coverage countries, i.e., Ireland and United Kingdom (referred to as Anglo-Saxon countries), and (iv) low spending/low coverage countries, i.e., Greece, Italy, Portugal, and Spain (referred to as Mediterranean countries). Since Eastern European countries are not covered by Bonoli’s typology, we add a fifth category that includes the residual countries, i.e., Hungary, Poland, and Slovenia. The estimation results are shown in Table 4.

While the positive effect of total income on volunteering holds for all welfare regimes, opportunity costs of time work differently across countries. Evidence for a negative relationship between hours of work and voluntary labor supply is only found for the Continental and the Eastern European countries, while in the Anglo-Saxon countries we observe a U-shaped relationship between an individual’s opportunity costs of time and his decision to work voluntarily for the charity. The latter result might indicate that in countries with a low level of social expenditures, individuals who are successful in the labor market feel the need to do some beneficial for the society and therefore spare some of their rare time to work voluntarily for the charity. This interpretation is supported by the finding of a strong positive correlation between working hours and money donations in the Anglo-Saxon countries, i.e., those who have exceedingly high working hours are also more likely to spend money to the non-profit sector as compared to those with lower working hours. However, we do not find support for this hypothesis in the Mediterranean countries, which are also characterized by low expenditures on social welfare. In the Mediterranean countries, the individual’s decision on whether to spend time or money to the charity is unaffected by hours of work. This finding supports the conclusion that – at

¹¹We further estimated the model separately by country. However, due to the small number of observations and the small proportion of volunteers in some countries, estimation results are not reliable.

¹²“Quantity” and “quality” of welfare provision are measured by social expenditure as a proportion of GDP and contribution-financing as a proportion of social expenditure, respectively.

least in some countries – something more than an individual’s valuation of time underlies his decision to spend time to the charity.

Besides the heterogeneous effects of working hours across countries, we find differences in socio-demographic characteristics associated with volunteering across welfare regimes. The overall finding that the probability of donating money does not vary by sex cannot be confirmed for all country groups. While women are significantly more likely to spend money in high-spending countries (i.e., the Continental and the Scandinavian countries), men have a higher probability to do so in low-spending countries (i.e., the Anglo-Saxon and the Mediterranean countries). In the Eastern European countries, no gender differences in civic engagement can be observed. Immigrants are less likely to spend time and money to voluntary organizations in the Continental, the Scandinavian, and the Mediterranean countries, while this does not hold true for the Anglo-Saxon and the Eastern European countries. In the Anglo-Saxon countries, immigrants actually show a significantly higher probability of donating money than natives. While church members are more likely to spend time or money to voluntary organizations in all country groups, this does not hold true for the Mediterranean countries, where church members do not differ from non-members with respect to civic engagement. This result might be due to the fact that the Mediterranean countries are characterized by an exceedingly high share of religious people among its population (in our data, almost 80% of the respondents from these countries belong to a religious denomination). As Ruiter and de Graaf (2006) show, the differences between secular and devout people are substantially higher in secular countries than in religious countries and individual religiosity is hardly relevant for volunteering in the latter countries.

Table 4 finally shows that the positive relationship between voluntary labor and voluntary giving holds for all country groups. Overall, correlation in unobservables appears to be stronger in country groups with low volunteering rates and smaller in country groups with high volunteering rates.

5 Conclusion

Previous research on volunteering has mainly focused on explaining charitable contributions of time, i.e., voluntary labor supply, while charitable contributions of money are disregarded. Such analyses ignore the fact that there exist two ways of contributing to the charity – spending time and spending money. Based on the interpretation of volunteering as a consumption good, this paper investigates the determinants of individuals’ charitable cash donations and volunteer labor, allowing the decisions on spending time and money to be correlated with each other. The analysis is based upon data from the ESS, a representative survey across 19 countries which contains detailed information on individuals’ participation in several types of voluntary organizations. This detailed information enables us to not only analyze volunteering on an

aggregate level, but investigate variations in the determinants of philanthropic behavior across different types of voluntary organizations and welfare regimes.

Both on the individual and the country level, we find a positive relationship between charitable contributions of time and charitable contributions of money. The hypothesis that time and money donations are gross complements, as concluded by Menchik and Weisbrod (1987) and Brown and Lankford (1992), however, is not supported by our analysis. There are two possible explanations for these diverging results. By having information on the individual's marginal tax rate and therefore the individual price of money donations, the authors are able to estimate price and cross-price elasticities for both voluntary labor and voluntary donations and may therefore provide a more complete picture of the relationship between time and money donations. However, the accuracy of their estimates comes at the costs of restricting the analysis to a non-representative sample, i.e., individuals who are the sole wage earner in the household. With our analysis of a representative sample of individuals in 19 European countries, we are therefore able to draw more general conclusions about individual decision making with respect to voluntary labor and money donations.¹³

Analyzing philanthropic behavior on a disaggregated level further reveals large differences in the determinants of time and money donations – both across different types of voluntary organizations and across different welfare regimes. This suggests that volunteering is not a “homogeneous commodity” (Segal and Weisbrod, 2002), but rather a heterogeneous good that offers utility in multiple dimensions that vary across voluntary organizations and countries.

However, our findings also suggest that cross-country differences with respect to volunteering need further investigations. Although we find large differences in individual determinants of philanthropic behavior across countries, these differences account for only a small proportion of variation in volunteering rates across countries. This result is in line with the findings of Plagnol and Huppert (2010), who analyze the factors associated with formal and informal voluntary labor supply across European countries. Although controlling for a variety of social, psychological, and cultural factors associated with the individuals' decision to volunteer, they find that only a small proportion of national differences in volunteer rates can be explained by differences in individual factors. These findings highlight the need for future research to take further into consideration country-level differences, including cultural and institutional differences between countries in order to explain regional variations in volunteering.

¹³Please note that the results of our study are in any case not comparable to previous literature, as Menchik and Weisbrod (1987) and Brown and Lankford (1992) focus on the U.S., a country with a long history of philanthropy that ranks among the most charitable countries in the world (Charities Aid Foundation, 2011).

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Figures

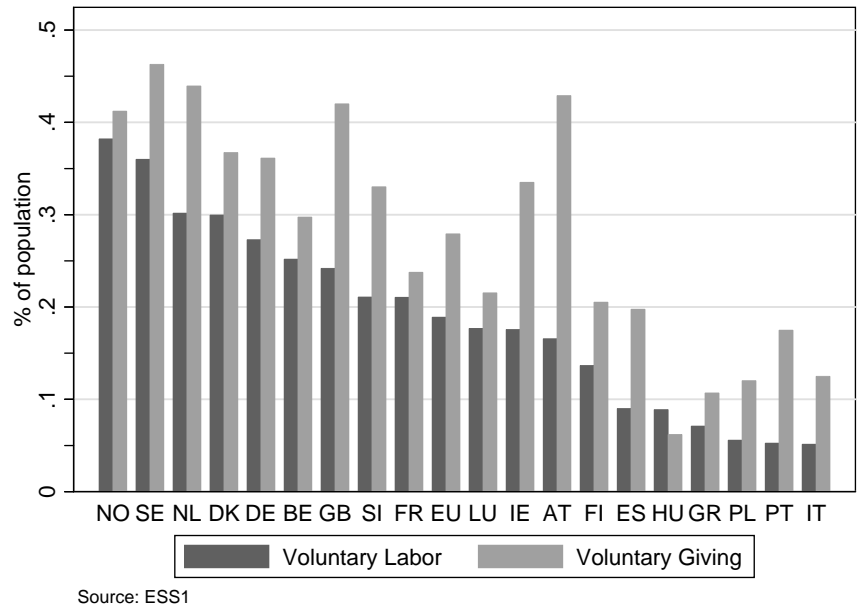


Figure 1: SHARE OF VOLUNTEERS ACROSS EUROPE

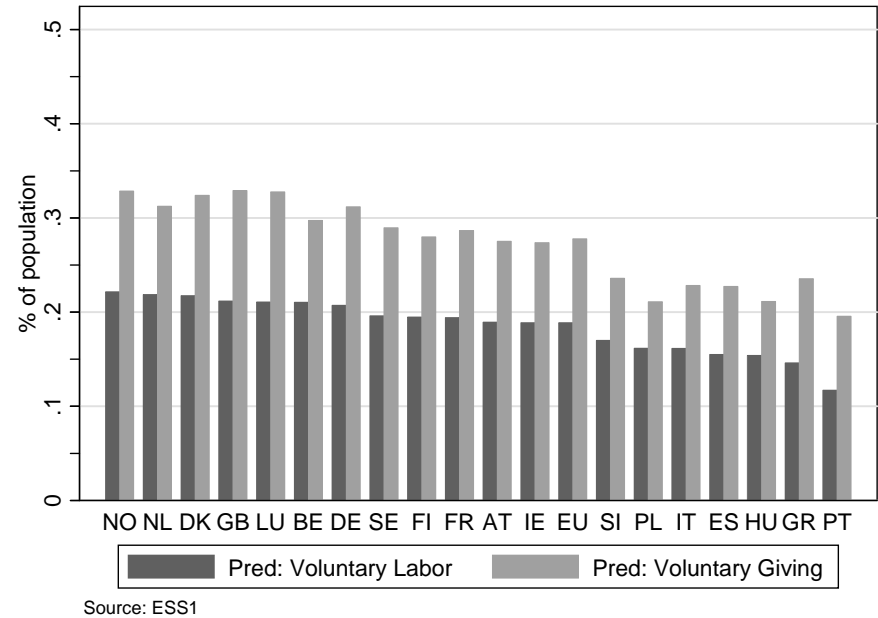


Figure 2: PREDICTION – COUNTRY FIXED EFFECTS EXCLUDED

Tables

Table 1: VOLUNTARY LABOR AND GIVING BY ORGANIZATION

	Labor Mean/StdDev	Giving Mean/StdDev	Difference t-value
Humanitarian/social organization	0.070 (0.25)	0.170 (0.38)	33.51 [†]
Cultural/sports/hobby activity organization	0.106 (0.31)	0.093 (0.29)	−4.68 [†]
Profession/science/political organization	0.054 (0.23)	0.065 (0.25)	5.26 [†]
Religious/church organization	0.033 (0.18)	0.072 (0.26)	18.70 [†]
Total	0.179 (0.38)	0.268 (0.44)	23.12 [†]
Observations	22,756		

Source: ESS 1, own calculations. Notes: – Significant at [†]: 0.1% level; ***: 1% level; **: 5% level; *: 10% level.

Table 2: BIVARIATE PROBIT: VOLUNTARY LABOR AND GIVING

	(1)		(2)	
	Labor ME/StdE	Donation ME/StdE	Labor ME/StdE	Donation ME/StdE
<i>Working hours (Ref.: 35-45)</i>				
0 (not employed)	-0.001 (0.011)	-0.035** (0.015)	-0.001 (0.011)	-0.033* (0.016)
1-20	0.050† (0.014)	0.022 (0.026)	0.048† (0.013)	0.020 (0.026)
21-34	0.044*** (0.015)	0.033 (0.026)	0.044*** (0.016)	0.032 (0.028)
> 45	0.008 (0.006)	0.027** (0.012)	0.008 (0.006)	0.027** (0.013)
Total income	0.037† (0.009)	0.082† (0.021)	0.033† (0.010)	0.080† (0.021)
Total income ²	-0.004*** (0.002)	-0.007*** (0.002)	-0.004** (0.002)	-0.007*** (0.002)
Female	-0.028† (0.004)	0.000 (0.010)	-0.028† (0.004)	-0.003 (0.011)
<i>Age group (Ref.: Age 26-45)</i>				
Age 16-25	0.007 (0.016)	-0.047** (0.018)	0.008 (0.017)	-0.050** (0.019)
Age 46-65	0.029*** (0.011)	0.019*** (0.007)	0.029*** (0.011)	0.019** (0.008)
<i>Highest level of education (Ref.: Secondary education)</i>				
Primary education	-0.068† (0.014)	-0.082† (0.012)	-0.067† (0.014)	-0.080† (0.012)
Tertiary education	0.064† (0.010)	0.104† (0.008)	0.065† (0.010)	0.105† (0.008)
Immigrant	-0.048† (0.011)	-0.031 (0.028)	-0.051*** (0.014)	-0.035 (0.032)
Church member	0.061† (0.017)	0.083† (0.015)	0.058† (0.016)	0.081† (0.015)
Partner in household	-0.001 (0.009)	-0.000 (0.010)	0.001 (0.010)	-0.001 (0.010)
No. of household members	0.012*** (0.004)	0.011** (0.005)	0.012*** (0.004)	0.012** (0.005)
Child 0-5	-0.051† (0.008)	-0.018 (0.017)	-0.052† (0.008)	-0.019 (0.017)
Child 6-12	0.041† (0.013)	0.008 (0.006)	0.039*** (0.014)	0.007 (0.007)
<i>Urbanization (Ref.: Intermediate)</i>				
Densely populated area	-0.001 (0.008)	0.041† (0.011)	-0.002 (0.010)	0.042† (0.013)
Thinly populated area	0.044† (0.012)	0.013 (0.021)	0.043*** (0.014)	0.014 (0.022)
<i>Regional indicators</i>				
Unemployment rate	—	—	-0.004 (0.003)	-0.003** (0.001)
Female labor force participation	—	—	-0.001 (0.002)	-0.000 (0.002)
GDP	—	—	0.021 (0.028)	0.016 (0.024)
Country dummies	yes	yes	yes	yes
Log likelihood	-19,734.5		-18,701.1	
$\hat{\rho}$	0.552		0.561	
Wald $\chi^2(1)$	484.201		508.168	
Observations	22,756		18,548	

Source: ESS 1, own calculations. Notes: — Significant at †: 0.1% level; ***: 1% level; **: 5% level; *: 10% level. — Total income is defined as monthly household income in ppp in 1,000€. — Due to lack of regional data, observations from Denmark, Finland and Norway have to be excluded from model (2).

Table 3.1: BIVARIATE PROBIT: VOLUNTARY LABOR AND GIVING BY TYPE OF ORGANIZATION

	Social organizations			Leisure activity organizations			Work-related/political organizations			Religious organizations		
	Labor ME/StDE	Donation ME/StDE		Labor ME/StDE	Donation ME/StDE		Labor ME/StDE	Donation ME/StDE		Labor ME/StDE	Donation ME/StDE	
<i>Working hours (Ref.: 35-45)</i>												
0 (not employed)	0.025*** (0.009)	0.000 (0.007)		-0.005 (0.003)	-0.007 (0.006)		-0.008 (0.003)	-0.033 [†] (0.003)		0.006* (0.003)	-0.001 (0.004)	
1-20	0.034*** (0.015)	0.042*** (0.020)		0.026 [†] (0.006)	0.009 (0.012)		0.012 [†] (0.002)	-0.010 (0.009)		0.018 [†] (0.006)	0.015*** (0.005)	
21-34	0.012 (0.012)	0.020 (0.020)		0.044 [†] (0.013)	0.025*** (0.012)		0.008 (0.009)	-0.005 (0.006)		0.011 [†] (0.004)	0.005 (0.007)	
> 45	0.010* (0.006)	0.020*** (0.007)		-0.000 (0.007)	0.016** (0.007)		0.009** (0.003)	0.001 (0.004)		0.005 (0.004)	0.002 (0.005)	
Total income	0.011** (0.004)	0.038 [†] (0.011)		0.017 (0.010)	0.030** (0.012)		0.015 [†] (0.004)	0.027 [†] (0.005)		-0.001 (0.002)	0.011*** (0.004)	
Total income ²	-0.001 (0.001)	-0.007 [†] (0.001)		-0.002 (0.002)	-0.002 (0.002)		-0.001 [†] (0.000)	-0.002 [†] (0.001)		0.000 (0.000)	-0.001*** (0.000)	
Female	0.008* (0.004)	0.020** (0.009)		-0.041 [†] (0.006)	-0.038 [†] (0.009)		-0.003** (0.002)	-0.006 (0.004)		0.002 (0.002)	0.006** (0.003)	
<i>Age group (Ref.: Age 26-45)</i>												
Age 16-25	0.016*** (0.006)	-0.017 (0.016)		0.010* (0.006)	-0.010 (0.013)		-0.022* (0.009)	-0.037 [†] (0.005)		0.002 (0.004)	-0.005 (0.009)	
Age 46-65	0.016*** (0.006)	0.021*** (0.007)		0.010** (0.005)	0.008 (0.006)		0.010 (0.008)	0.013*** (0.005)		0.009 [†] (0.003)	0.011** (0.005)	
<i>Highest level of education (Ref.: Secondary education)</i>												
Primary education	-0.035 [†] (0.005)	-0.067 [†] (0.007)		-0.033 [†] (0.007)	-0.027 [†] (0.006)		-0.026 [†] (0.004)	-0.015** (0.006)		-0.008 (0.005)	-0.010 (0.007)	
Tertiary education	0.031 [†] (0.004)	0.071 [†] (0.007)		0.029 [†] (0.008)	0.038 [†] (0.006)		0.027 [†] (0.004)	0.022 [†] (0.004)		0.012 [†] (0.001)	0.020 [†] (0.004)	
Immigrant	-0.006 (0.005)	0.001 (0.018)		-0.022** (0.009)	-0.011 (0.012)		-0.010 [†] (0.002)	-0.004 (0.004)		-0.004 (0.003)	0.011* (0.007)	
Church member	0.044 [†] (0.007)	0.082 [†] (0.013)		0.024** (0.011)	0.012** (0.005)		0.002 (0.005)	0.014** (0.006)		0.039 [†] (0.002)	0.081 [†] (0.004)	
Partner in household	-0.004 (0.003)	0.006 (0.006)		0.004 (0.007)	-0.001 (0.050)		0.001 (0.005)	-0.004 (0.003)		0.001 (0.002)	0.002 (0.003)	
No. of household members	0.004 (0.003)	0.003 (0.003)		0.009 [†] (0.002)	0.010*** (0.003)		0.006 [†] (0.002)	0.009 [†] (0.001)		0.003** (0.001)	0.004** (0.002)	
Child 0-5	-0.020** (0.007)	0.001 (0.014)		-0.037 [†] (0.006)	-0.024 [†] (0.004)		-0.010** (0.003)	-0.013 [†] (0.003)		-0.003 (0.003)	-0.005* (0.004)	
Child 6-12	0.013 (0.010)	0.015* (0.008)		0.008* (0.005)	-0.001 (0.006)		0.041 [†] (0.009)	0.024 [†] (0.007)		-0.001 (0.003)	0.003 (0.005)	
<i>Urbanization (Ref.: Intermediate)</i>												
Densely populated area	-0.002 (0.004)	0.035 [†] (0.010)		-0.013 [†] (0.003)	0.006 (0.004)		0.006 (0.005)	0.006 (0.005)		0.003 (0.002)	0.005 (0.005)	
Thinly populated area	0.011* (0.006)	0.018 (0.019)		0.031 [†] (0.006)	0.011 (0.011)		0.011** (0.006)	0.002 (0.006)		0.006* (0.004)	0.005 (0.009)	
Country dummies	yes	yes		yes	yes		yes	yes		yes	yes	
Log likelihood	-13.499.7			-11.974.2			-8.372.0			-6.712.4		
$\hat{\rho}$	0.569			0.645			0.636			0.768		
Wald χ^2 (1)	127.884			251.257			150.832			191.311		
Observations	22,756			22,756			22,756			22,756		

Source: ESS 1, own calculations. Notes: - Significant at [†]: 0.1% level; **: 1% level; ***: 5% level; *: 10% level. - Total income is defined as monthly household income in ppp in 1,000€.

Table 3.2: BIVARIATE PROBIT: VOLUNTARY LABOR AND GIVING BY TYPE OF ORGANIZATION – REGIONAL INDICATORS

	Social organizations		Leisure activity organizations		Work-related/political organizations		Religious organizations	
	Labor ME/StdE	Donation ME/StdE	Labor ME/StdE	Donation ME/StdE	Labor ME/StdE	Donation ME/StdE	Labor ME/StdE	Donation ME/StdE
Unemployment rate	-0.001 (0.001)	-0.001 (0.001)	-0.004** (0.002)	-0.002*** (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.000)	-0.000 (0.000)
Female labor force participation	0.001 (0.001)	0.002 (0.002)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.000)	-0.001 (0.001)	0.001* (0.000)	0.000 (0.001)
GDP	0.011 (0.009)	0.012 (0.012)	0.009 (0.017)	-0.016 (0.013)	0.011 (0.009)	0.011*** (0.004)	0.002 (0.005)	-0.005 (0.005)
Individual controls	yes	yes	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes	yes	yes
Log likelihood	-12,753.0		-11,290.9		-8,001.2		-6,421.0	
$\hat{\rho}$	0.578		0.654		0.641		0.775	
Wald $\chi^2(1)$	125.244		249.223		142.142		198.325	
Observations	18,548		18,548		18,548		18,548	

Source: ESS 1, own calculations. Notes: – Significant at † : 0.1% level; *** : 1% level; ** : 5% level; * : 10% level. – Individual controls are the same as in Table 2 – Due to lack of regional data, observations from Denmark, Finland and Norway have to be excluded from the regressions.

Table 4: BIVARIATE PROBIT: VOLUNTARY LABOR AND GIVING BY COUNTRY GROUP

	Scandinavian			Continental			Anglo-Saxon			Mediterranean			Eastern Europe		
	Labor ME/Stde	Donation ME/Stde		Labor ME/Stde	Donation ME/Stde		Labor ME/Stde	Donation ME/Stde		Labor ME/Stde	Donation ME/Stde		Labor ME/Stde	Donation ME/Stde	
<i>Working hours (Ref.: 35-45)</i>															
0 (not employed)	-0.021 (0.033)	-0.066 [†] (0.009)		0.008 (0.020)	0.000 (0.006)		0.009 (0.011)	-0.107 [†] (0.004)		0.004 (0.009)	-0.021 (0.017)		-0.020 (0.013)	-0.045** (0.017)	
1-20	0.021 (0.015)	0.004 (0.027)		0.089 [†] (0.015)	0.057 (0.037)		0.049 [†] (0.004)	-0.037 [†] (0.000)		-0.032 (0.027)	0.011 (0.066)		0.010 (0.011)	-0.022** (0.009)	
21-34	0.002 (0.022)	-0.015 (0.032)		0.080 [†] (0.020)	0.061 [†] (0.017)		-0.008*** (0.003)	-0.062 [†] (0.005)		0.016 (0.035)	0.092 (0.094)		0.059 [†] (0.001)	-0.012 (0.011)	
> 45	0.007 (0.021)	0.068*** (0.026)		0.009 (0.008)	0.052 [†] (0.009)		0.025 [†] (0.005)	0.024 [†] (0.004)		0.001 (0.016)	-0.008 (0.028)		0.001 (0.014)	-0.005 (0.014)	
Total income	0.040 [†] (0.011)	0.059 [†] (0.013)		0.066 [†] (0.016)	0.119 [†] (0.021)		0.021 [†] (0.001)	0.013*** (0.005)		0.021*** (0.008)	0.101 [†] (0.028)		0.017** (0.008)	0.058 [†] (0.008)	
Total income ²	-0.007** (0.003)	-0.003 (0.004)		-0.009 [†] (0.002)	-0.010 [†] (0.003)		-0.001 [†] (0.000)	0.002*** (0.001)		-0.003*** (0.001)	-0.015*** (0.005)		-0.002*** (0.001)	-0.004 [†] (0.001)	
Female	-0.050* (0.027)	0.067 [†] (0.016)		-0.034 [†] (0.003)	0.020 [†] (0.005)		-0.047 [†] (0.002)	-0.039 [†] (0.003)		-0.013** (0.005)	-0.034 [†] (0.008)		-0.002 (0.005)	0.003 (0.009)	
<i>Age group (Ref.: Age 26-45)</i>															
Age 16-25	0.002 (0.010)	0.016 (0.019)		-0.021* (0.012)	-0.078 [†] (0.019)		0.084 [†] (0.011)	0.019** (0.009)		-0.002 (0.027)	-0.058* (0.029)		0.019** (0.011)	-0.024** (0.010)	
Age 46-65	0.026 [†] (0.007)	0.031** (0.015)		0.026*** (0.009)	0.027*** (0.010)		0.103 [†] (0.006)	0.024 [†] (0.001)		0.006 (0.006)	-0.001 (0.014)		-0.007 (0.004)	-0.002 (0.008)	
<i>Highest level of education (Ref.: Secondary education)</i>															
Primary education	-0.036** (0.014)	-0.155 [†] (0.020)		-0.086 [†] (0.014)	-0.114 [†] (0.020)		-0.143 [†] (0.010)	-0.136 [†] (0.009)		-0.022* (0.010)	-0.039 [†] (0.010)		0.025 (0.052)	0.056 (0.112)	
Tertiary education	0.075 [†] (0.007)	0.108 [†] (0.007)		0.088 [†] (0.015)	0.122 [†] (0.011)		0.033 [†] (0.006)	0.093 [†] (0.001)		0.038 [†] (0.006)	0.058*** (0.021)		0.051 [†] (0.011)	0.084 [†] (0.013)	
Immigrant	-0.089*** (0.026)	-0.024*** (0.007)		-0.073 [†] (0.015)	-0.053 (0.031)		-0.010 (0.008)	0.074 [†] (0.003)		-0.035** (0.010)	-0.095 [†] (0.015)		-0.028 (0.011)	-0.017 (0.020)	
Church member	0.067** (0.029)	0.063 [†] (0.016)		0.088** (0.038)	0.092 [†] (0.005)		0.098 [†] (0.005)	0.170 [†] (0.004)		0.003 (0.012)	0.005 (0.031)		0.015 [†] (0.005)	0.051 [†] (0.002)	
Partner in household	-0.026** (0.013)	-0.004 (0.010)		-0.002 (0.023)	-0.025** (0.011)		-0.001 (0.001)	0.038 [†] (0.003)		0.011 (0.018)	0.007 (0.010)		-0.004 (0.007)	0.012 [†] (0.002)	
No. of household members	0.015*** (0.006)	0.011 (0.011)		0.021*** (0.007)	0.020 [†] (0.005)		0.003 (0.002)	-0.006 (0.006)		0.012 [†] (0.003)	0.014 (0.009)		-0.000 (0.001)	0.007 [†] (0.001)	
Child 0-5	-0.037 [†] (0.007)	-0.013 (0.023)		-0.074 [†] (0.017)	-0.007 (0.019)		-0.042 [†] (0.002)	-0.059 [†] (0.001)		-0.036 (0.016)	0.015 (0.052)		-0.026 [†] (0.002)	-0.050 [†] (0.004)	
Child 6-12	0.057** (0.027)	0.013 (0.009)		0.053 [†] (0.016)	-0.002 (0.005)		0.107 [†] (0.011)	0.043 [†] (0.007)		-0.003 (0.023)	-0.001 (0.020)		-0.004 (0.014)	0.008* (0.004)	
<i>Urbanization (Ref.: Intermediate)</i>															
Densely populated area	-0.027 (0.022)	0.014 (0.012)		-0.012* (0.006)	0.044*** (0.017)		0.025*** (0.010)	0.061 [†] (0.016)		-0.003 (0.013)	0.051*** (0.019)		0.004 (0.006)	-0.007 (0.006)	
Thinly populated area	0.042 [†] (0.008)	-0.001 (0.018)		0.085 [†] (0.008)	0.038 (0.026)		0.040 [†] (0.003)	0.002 (0.007)		0.017 [†] (0.005)	0.041 [†] (0.007)		-0.023*** (0.007)	-0.060*** (0.019)	
Country dummies	yes	yes		yes	yes		yes	yes		yes	yes		yes	yes	
Log likelihood	-1.693.2			-9.979.1			-3.703.4			-2.690.1			-1.404.8		
$\hat{\rho}$	0.376			0.537			0.603			0.591			0.677		
Wald $\chi^2(1)$	70.658			591.869			739.244			27.088			321.328		
Observations	5,741			7,501			2,714			3,288			3,512		

Source: ESS 1, own calculations. Notes: - Significant at [†]: 0.1% level; ***: 1% level; **: 5% level; *: 10% level. - Total income is defined as monthly household income in ppp in 1,000€.

Appendix A

The Lagrangian function for the individual's contributions of time and money is:

$$L = U(t^l, t^v, D, C) - \lambda [w(T - t^l - t^v) + y - D - C] \quad (\text{A1})$$

The individual's first order conditions yield:

$$\begin{aligned} \frac{\partial U}{\partial t^l} + \lambda w &= 0 \\ \frac{\partial U}{\partial t^v} + \lambda w &= 0 \\ \frac{\partial U}{\partial D} + \lambda &= 0 \\ \frac{\partial U}{\partial C} + \lambda &= 0 \\ w(T - t^l - t^v) + y - D - C &= 0 \end{aligned} \quad (\text{A2})$$

Hence, it follows that the marginal rate of substitution between spending time and money equals the wage rate:

$$\frac{\frac{\partial U}{\partial t^v}}{\frac{\partial U}{\partial D}} = w \quad (\text{A3})$$

Appendix B

Table B1: TYPES OF VOLUNTARY ORGANIZATIONS

Social organizations	Leisure activity organizations	Work-related and political organizations	Religious organizations
– peace organizations	– consumer organizations	– business organizations	– religious organizations
– animal organizations	– automobile organizations	– profession organizations	– church organizations
– social clubs	– cultural organizations	– farmers organizations	
– environmental organizations	– hobby activity organizations	– trade unions	
– humanitarian organizations	– outdoor activity clubs	– political parties	
	– sports clubs	– science organizations	
		– education organizations	
		– teacher organizations	

Table B2: DESCRIPTIVE STATISTICS

	All Mean/StdDev	Volunteers Mean/StdDev	Non volunteers Mean/StdDev	Difference t-value
<i>Working hours (Ref.: 35-45)</i>				
0 (not employed)	0.258 (0.44)	0.184 (0.39)	0.295 (0.46)	-18.23 [†]
1-20	0.081 (0.27)	0.098 (0.30)	0.072 (0.26)	6.91 [†]
21-34	0.074 (0.26)	0.095 (0.29)	0.063 (0.24)	8.62 [†]
35-45	0.383 (0.49)	0.410 (0.49)	0.370 (0.48)	5.91 [†]
> 45	0.204 (0.40)	0.213 (0.41)	0.200 (0.40)	2.25**
Total income	1.229 (1.02)	1.550 (1.14)	1.067 (0.90)	34.76 [†]
Female	0.518 (0.50)	0.505 (0.50)	0.525 (0.50)	-2.79***
<i>Age group</i>				
Age 16-25	0.153 (0.36)	0.117 (0.32)	0.172 (0.38)	-10.79 [†]
Age 26-45	0.442 (0.50)	0.456 (0.50)	0.435 (0.50)	3.06***
Age 46-65	0.405 (0.49)	0.427 (0.49)	0.394 (0.49)	4.81 [†]
<i>Highest level of education</i>				
Primary education	0.118 (0.32)	0.066 (0.25)	0.145 (0.35)	-17.46 [†]
Secondary education	0.644 (0.48)	0.575 (0.49)	0.680 (0.47)	-15.66 [†]
Tertiary education	0.237 (0.43)	0.359 (0.48)	0.176 (0.38)	31.34 [†]
Immigrant	0.075 (0.26)	0.076 (0.26)	0.075 (0.26)	0.21
Church member	0.605 (0.49)	0.603 (0.49)	0.605 (0.49)	-0.32
Partner in household	0.679 (0.62)	0.715 (0.58)	0.661 (0.64)	8.23 [†]
No. of household members	3.141 (1.41)	3.032 (1.34)	3.196 (1.44)	-8.30 [†]
Child 0-5	0.144 (0.35)	0.139 (0.35)	0.146 (0.35)	-1.60
Child 6-12	0.188 (0.39)	0.203 (0.40)	0.180 (0.38)	4.11 [†]
<i>Urbanization</i>				
Densely populated area	0.293 (0.46)	0.327 (0.47)	0.276 (0.45)	7.93 [†]
Intermediate area	0.363 (0.48)	0.335 (0.47)	0.377 (0.48)	-6.19 [†]
Thinly populated area	0.344 (0.48)	0.338 (0.47)	0.347 (0.48)	-1.33
<i>Regional indicators</i>				
Unemployment rate	9.335 (5.76)	7.837 (4.78)	10.084 (6.05)	-26.60 [†]
Female labor force participation	44.303 (9.08)	47.300 (8.18)	42.807 (9.13)	34.09 [†]
GDP	1.045 (0.36)	1.144 (0.34)	0.997 (0.36)	26.40 [†]
Observations	22756	8253	14503	

Source: ESS 1, own calculations. Notes: – Significant at [†]: 0.1% level; ***: 1% level; **: 5% level; *: 10% level. – Volunteers are defined as individuals who donated time or money to any voluntary organization, while non volunteers neither spent time nor money for charitable purposes. – Total income is defined as monthly household income in ppp in 1,000€.

Table B3: BIVARIATE PROBIT: VOLUNTARY LABOR AND GIVING BY SEX

	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
	Labor ME/StdE	Donation ME/StdE	Labor ME/StdE	Donation ME/StdE	Labor ME/StdE	Donation ME/StdE
<i>Working hours (Ref.: 35-45)</i>						
0 (not employed)	-0.018 (0.017)	-0.055** (0.025)	-0.018 (0.018)	-0.015 (0.015)	0.016 (0.010)	-0.011 (0.013)
1-20	0.044*** (0.018)	-0.012 (0.031)	0.044** (0.019)	0.038 (0.024)	0.053† (0.012)	0.034 (0.024)
21-34	0.040 (0.041)	0.029 (0.050)	0.042 (0.042)	0.050† (0.008)	0.048† (0.009)	0.031* (0.017)
> 45	0.011 (0.011)	0.029* (0.016)	0.012 (0.011)	0.016 (0.012)	-0.000 (0.013)	0.015 (0.022)
Total income	0.037** (0.017)	0.075† (0.018)	0.035* (0.019)	0.038† (0.010)	0.031† (0.008)	0.089† (0.025)
Total income ²	-0.004* (0.002)	-0.006** (0.002)	-0.004* (0.002)	-0.005** (0.002)	-0.004* (0.002)	-0.009*** (0.003)
<i>Age group (Ref.: Age 26-45)</i>						
Age 16-25	0.030* (0.019)	-0.004 (0.032)	0.032* (0.020)	-0.013 (0.019)	-0.012 (0.020)	-0.081*** (0.026)
Age 46-65	0.051† (0.008)	0.019 (0.012)	0.052† (0.007)	0.018 (0.013)	0.008 (0.021)	0.015 (0.011)
<i>Highest level of education (Ref.: Secondary education)</i>						
Primary education	-0.063† (0.016)	-0.064*** (0.023)	-0.063† (0.016)	-0.071† (0.024)	-0.070† (0.013)	-0.095† (0.011)
Tertiary education	0.051*** (0.017)	0.090† (0.011)	0.049*** (0.017)	0.079† (0.012)	0.083† (0.013)	0.118† (0.011)
Immigrant	-0.017 (0.014)	-0.014 (0.034)	-0.017 (0.017)	-0.047† (0.012)	-0.051*** (0.014)	-0.052 (0.032)
Church member	0.062*** (0.019)	0.094† (0.014)	0.060*** (0.019)	0.060† (0.017)	0.056*** (0.016)	0.066*** (0.023)
Partner in household	0.004 (0.015)	0.024 (0.025)	0.005 (0.015)	-0.007 (0.021)	-0.005 (0.022)	-0.018 (0.011)
No. of household members	0.011*** (0.003)	0.015* (0.008)	0.011*** (0.004)	0.012 (0.008)	0.006 (0.005)	0.007 (0.008)
Child 0-5	-0.041* (0.020)	-0.009 (0.023)	-0.044** (0.021)	-0.059*** (0.016)	-0.059*** (0.017)	-0.032** (0.015)
Child 6-12	0.051† (0.011)	-0.007 (0.010)	0.050† (0.012)	0.028* (0.011)	0.017 (0.012)	0.016 (0.012)
<i>Urbanization (Ref.: Intermediate)</i>						
Densely populated area	-0.021† (0.005)	0.075† (0.014)	-0.022† (0.005)	0.018 (0.013)	0.017 (0.018)	0.010 (0.018)
Thinly populated area	0.034** (0.017)	0.037 (0.029)	0.032* (0.018)	0.056† (0.013)	0.056† (0.014)	-0.005 (0.023)
<i>Regional indicators</i>						
Unemployment rate	-	-	-0.004 (0.003)	-0.003** (0.001)	-0.005* (0.003)	-0.003 (0.002)
Female labor force participation	-	-	-0.002 (0.002)	-0.002 (0.002)	-0.001 (0.002)	0.002 (0.003)
GDP	-	-	0.018 (0.032)	0.025 (0.027)	0.024 (0.029)	0.012 (0.035)
Country dummies	yes	yes	yes	yes	yes	yes
Log likelihood	-9,693.8	-9,168.9	-9,168.9	-9,958.4	-9,444.1	-9,444.1
ρ	0.578	0.588	0.588	0.529	0.539	0.539
Wald $\chi^2(1)$	193.391	179.850	179.850	238.313	249.885	249.885
Observations	11,085	8,882	8,882	11,671	9,666	9,666

Source: ESS 1, own calculations. Notes: – Significant at †: 0.1% level; **: 1% level; ***: 5% level; *: 10% level. – Total income is defined as monthly household income in ppp in 1,000€. – Due to lack of regional data, observations from Denmark, Finland and Norway have to be excluded from model (2).