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Abstract

The paper studies the effect of voluntary work on labour income for Italian employees. The Heckman and Instrumental Variables methods are used in order to control for self-selection bias of participation in labour market and endogeneity of volunteering. The results show that a wage premium of 3 - 4 percent of annual income emerges, when selection and endogeneity problems are taken into account

Keywords: voluntary work, labour income, instrumental variables

JEL Classification C36, J31

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1. Introduction

Volunteering attracted economists' attention mostly because it proves the existence of behaviours that do not respond only to economic incentives. Attempts to explain volunteers' choices in the classical optimization framework recognize two fundamental motives for volunteering: a consumption motive, stressing that 'helping others' is a value for itself, pursued for intrinsic or social motivations (self determination and self respect, reputation, adherence to social norms); an investment motive, where unpaid or volunteering activities are performed to gain higher future remunerations. Economic models and empirical tests alternatively give prominence to the consumption or to the investment hypothesis (Andreoni 1990; Menchik and Weisbrod 1987). An attempt to reconcile both motivations to volunteering in a unique theoretical framework is in Bruno and Fiorillo (2012), where the simultaneous effect of consumption and investment motives is empirically tested. Results show that both motives interact in shaping regular unpaid labour supply, with a stronger impact of consumption motives and a little influence of investment motives.

The consumption motives is typically tested through correlation between voluntary activities and proxies of intrinsic or social motivation. On the other hand, the existence of investment motives can be supported by evidence on the correlation between volunteering and higher wages: volunteers use their available time to invest in future higher wages.

The wage premium for volunteering can be analyzed by answering three different questions: the first is about the existence of a wage premium, the second concerns its size and the third investigates why volunteering determines higher wages. The answer to each question entails addressing some theoretical and empirical problems, which have been variously considered in previous studies.

The existence of a wage premium has to be proved taking into account the potential endogeneity of volunteering. As stated by Day and Devlin (1998, 1184) "Such simultaneity may arise via two channels: first, the wage differential between volunteers and non-volunteers (if it exists) may itself motivate individuals to volunteer; and second, if volunteering is a normal good, then individuals with higher incomes may be more likely to volunteer". In the few empirical existing studies, only Hackl et al. (2008) control for potential endogeneity of volunteering.

The size of the wage premium is important to assess the relevance of the investment motives in volunteering. Unfortunately, empirical analyses prove a wage premium ranging from 7 to 18,5 percent. Day and Devlin (1997) find a significant positive wage premium for male volunteers about 11 percent but not for women. Using the same data set, Day and Devlin (1998) show that, on average, volunteers earn about 7 percent higher incomes than non-volunteers. Prouteau and Wolff (2006), do not prove a statistically wage premium for volunteers in the public sector. Finally, Hackl

et al. (2008) using Austrian data show that, on average, the wage premium for volunteers amount up to 18.5 percent. The wide range of values suggests that a selectivity bias related to the labour force participation may be important (Day and Devlin 1997): the wage premium could disappear or be reduced as one controls for selectivity bias, but none of the previous studies consider the selectivity bias related to the labour force. Other biases can influence the wage premium size, if the sample is restricted to solve problems with data availability. Moreover, in all studies, except Prouteau and Wolff (2006), the income data are not in the ideal form. Income is available on household basis and in ranges rather than levels. The sample is therefore restricted to households in which the respondent is the sole wage earner, assigning the midpoint of his/her net household income as value.

The third answer on wage premium for volunteering should explain why, if a wage premium exists, volunteers gain a higher income in the labour market. Three channels through which volunteering may affect earnings have been suggested (Day and Devlin 1997, 707-708).

First, voluntary work may provide individuals with an alternative means of acquiring skills and experience that make them more productive (the human capital hypothesis). An accurate test of the human capital hypothesis should include as regressors the experience in volunteer activities and the experience in the labour market. Only in Day and Devlin (1998), data on volunteering experience is available, whereas labour experience is also in Hackl et al (2007). The second channel of influence of volunteering on income underlines that volunteering may provide a signal to employers of otherwise unobservable ability (the screening hypothesis). If the wage premium is associated to unobservable characteristics, it should emerge also when a wide set of individual and labour market variables is employed. An overestimation of the size of the premium can emerge when employing parsimonious sets of regressors. Through the third channel volunteering may provide access to informal networks of contacts that can be useful in job search strategies (the networking hypothesis). Previous studies show mixed evidence on the relevance of this channel.

This paper tries to answer to the three questions about wage premium for volunteers using a sample of Italian employees from the 2006 European Union Statistics on Income and Living Conditions (EU-SILC) dataset. The existence of a wage premium is tested employing the instrumental variable method to account for the causality of the correlation between voluntary work and income. To prevent overestimation of the size of the wage premium, we take into account the selectivity bias related to the labour force participation. The availability of information about earnings for each worker of the sample allows an analysis that is not restricted to single-earner households. Finally, a discussion on the three channels of influence of volunteering on wages is

conducted, considering the role of a wide set of variables, including working experiences, and using participation in organizations as instrumental variables.

The remainder of the paper is organized as follows. Section 2 surveys previous empirical studies while Section 3 presents the empirical strategy used in this paper to analyze the effect of voluntary work on labour income. The data and the variables are presented in Section 4. Empirical results are shown in Section 5 and discussed in Section 6. Section 7 concludes.

2. Literature review

In economic literature empirical studies on the impact of voluntary work on earnings are relatively scarce. Since the seminal papers of Day and Devlin (1997, 1998), only a small number of studies have analyzed the phenomenon, because of the absence of data set suitable for testing the hypotheses. Most empirical studies prove a wage premium.

Using a Survey of Volunteer Activity conducted by Statistics Canada, Day and Devlin (1997) examine whether returns to voluntary work in the paid labour market can explain part of the male-female earnings gap. They find a significant positive wage premium for male volunteers about 11 percent but not for women. The decomposition of earnings differential between volunteers and non-volunteers shows that the differential is mainly attributable to differences in individual characteristics, both for males and females, in particular because volunteers are better educated than non-volunteers. This evidence indirectly supports the screening hypothesis. As to the additional returns to individual characteristics, mixed evidence emerges for males and females. For males, wage premium for volunteering is not an additional return of the previous characteristics, because it is for a great part unexplained. Because education is included in the individual characteristics, this evidence is not in favour of the human capital hypothesis. For females, much of the wage premium for volunteering is associated to a higher return to volunteering experience: volunteers with past experiences in volunteer activities are rewarded with an additional return to their experience in comparison to non-volunteers with the same past experience in volunteer activities. Also this puzzling evidence doesn't support the human capital hypothesis, if past experience in volunteer activities represents an investment in acquiring skills both for volunteers and non-volunteers. It could be reasonable that a 'motivational' premium is associated to those who constantly persevere in the volunteer activities.

Using the same data set, Day and Devlin (1998) test directly the human capital hypothesis, by considering three alternative measure of volunteering accounting for past and current volunteering. Unfortunately, the experience in volunteering gives no further information on the human capital

accumulation and their "empirical model is not capable of discriminating between… competing explanations" (p. 1190). However, they show that, on average, volunteers earn about 7 percent higher incomes than non-volunteers.

Prouteau and Wolff (2006) employ a switching regression model on a French survey to control for selectivity bias in the wage equation. Their analysis includes only those who take on responsibilities in associations, but all types of associations are considered (from recreational to professional), leading to mixed evidence on wage premium: results do not prove a wage premium for volunteers in the public sector, whereas in private sector they find a negative premium. On these results they reject the investment motive for volunteering, claiming that only consumption motives lead individuals to engage in voluntary activities. But the absence of wage premium can be also the result of some limitations of their analysis. A wide range of associations is considered and therefore also associations with explicitly leisure purposes, as a golf or tennis club, are included. Authors argument that by focusing only on participants with managerial tasks they implicitly limit the analysis to genuine volunteers, because French law prohibits compensations for these activities in associations, other than reimbursements of expenses. The argument is not fully convincing for three reasons. First, compensation can be hided under the label of reimbursements or other benefits and therefore many individuals observed may not to be unpaid volunteers. Second, the managerial position in the association can be the output and not the input of the networking activity, if it concerns a working career that is still at its maximum wage and needs different benefits in terms of prestige or social consideration to exploit[1]. Though it is difficult to think of the president or of the treasurer of a golf club as a volunteer, they probably are engaged in networking activities, with investment purposes, oriented toward social prestige and not toward higher wages. This intuition is indirectly confirmed by the same authors when they find a positive effect of managerial responsibilities in associations on the number of gatherings with friends, which they explain as a relational (consumption) motive for volunteering, but that could be also a networking (investment) motive. Therefore, when focusing on these 'volunteer managers' the wage premium disappears. Third, and probably more important, when selecting a subsample of individuals a careful analysis should verify the existence of a selection bias: have the association managers self selected themselves in that status? It could be that the associations' managers have a weaker investment motive, for unobservable characteristics, compared to the other association members, and just for these characteristics they are selected for the position.

[1] In the descriptive statistics, a half of associations managers are in the 40-50 age class, which is usually a peak in the wage profile.

Finally, Hackl et al. (2008), using Austrian data, show that on average the wage premium for volunteers amounts up to 18.5 percent. Their analysis is devoted to find support to the investment model, with the advantage of multiple dimensions employed to measure volunteering (the dichotomous variable, the numbers of hours individuals volunteer and the number of organizations they are engaged in). These multiple dimensions allow testing different hypotheses of behaviour and considering at once the three channels of influence of volunteering on earnings. Results show that numbers of volunteering hours plays an important role in explaining the wage premium, and this evidence is called to confirm the three hypotheses because more hours of volunteering have three effects: allow useful exercise to accumulate human capital, might intensify social contacts within the network, and signal the individual's willingness to perform. Note that self-selection of volunteers is confirmed in the analysis, strengthening the screening hypothesis, whereas the number of organizations one is engaged in has no significant impact on wages, weakening the networking hypothesis.

Summing up, the few studies concerning wage premium for volunteering give some support to the existence of an investment return to volunteering. When it is proved, the return to volunteering ranges from 7 percent to 18,5 percent, but it is difficult to discern which channel conduces to the investment return: evidence tends to support the screening hypothesis and to reject the human capital hypothesis.

3. Empirical strategy

In determining the effect of voluntary work on earnings the basic model to be estimated can be written as follows:

$$\ln W_i = X_{1i}\beta_1 + \alpha_1 V_i + \mu_{1i} \qquad (1)$$

where W_i denotes the individual wage, X_{1i} is a vector of exogenous individual characteristics that are thought to determine earnings, V_i is a dummy variable that takes the value of 1 if the individual supplies voluntary work, and 0 otherwise. β_1 and α_1 and are parameters to be estimated while μ_{1i} is a random error term.

As indicated above, the model may suffer from a type of sample selection problem as it ignores the potential bias introduced by the individual's decision to participate in the labour force. Working individuals may not be a random sub-sample of the population as they may have systematically different characteristics from those without a paid job. These characteristics may exercise an influence not only on the choice to work but also on volunteering and earnings, involving that the labour force participation and volunteering decisions need to be considered when modelling an

individual's attainment in the labour market. Moreover, voluntary work may be endogenous. If volunteers are individuals with above average ability, they will tend to have higher wages regardless of whether they have acquired any useful skills or contacts through volunteering, and thus volunteers' wages may be higher than those of non-volunteers simply because higher-income individuals are more likely to volunteer (Day and Devlin 1998, 720).

In this paper a double methodological approach is used to estimate the effect of voluntary work on earnings. First, a self-selection framework of labour market participation is employed in order to correct for potential sample selection bias. Second, the Instrumental Variable (IV) technique is employed to account for the endogeneity bias when estimating the effect of voluntary work on labour income.

We first start with Heckman techniques. The model consists of two equations: a labour force participation equation and a labour income equation.

Suppose that L_i^* is the continuous latent variable associated with the work decision. This can be expressed as

$$L_i^* = X_{2i}\beta_2 + \mu_{2i} \qquad (2)$$

where X_{2i} is a vector containing individual characteristics that influence the decision to enter the labour market, β_2 is a vector of parameters to be estimated and μ_{2i} is a random error term. If $L_i^* > 0$, the wage market exceeds the reservation wage, and the individual chooses to work. If $L_i^* \leq 0$, individual doesn't work. L_i^* is unobservable but depends on the observable binary variable L_i, that takes the value of 1 if the individual works and 0 if the individual does not work.

$$L_i = \begin{bmatrix} 0 \; if \; L_i^* \leq 0 \\ 1 \; if \; L_i^* > 0 \end{bmatrix}$$

Considering the potential bias related to the individual decision to participate in the labour force, the wage model can be rewritten as

$$\ln W_i = X_{1i}\beta_3 + \alpha_2 V_i + \gamma_1 \lambda_{1i} + \mu_{3i} \qquad (3)$$

where β_3, α_2 and γ_1 are parameters to be estimated, μ_{3i}, is a random error term and $\lambda_{1i} = \varphi(X_{2i}\beta_2)/\Phi(X_{2i}\beta_2)$ is the inverse Mills ratio for labour force participation equation where $\varphi(.)$ is the normal probability distribution and $\Phi(.)$ is the normal cumulative distribution.

The voluntary work equation is

$$V_i^* = X_{3i}\beta_4 + \mu_{4i} \qquad (4)$$

Where V_i^* is the latent variable describing the utility gain from volunteering, X_{3i} is a vector containing individual characteristics that influence the decision to supply unpaid work, β_4 is a vector of parameters to be estimated and μ_{4i} is a random error term. V_i^* is unobservable but linked to the observable dichotomous variable, V_i, that takes the value of 1 if the individual does voluntary work and 0 otherwise.

$$V_i = \begin{bmatrix} 0 \; if \; V_i^* \leq 0 \\ 1 \; if \; V_i^* > 0 \end{bmatrix}$$

The IV technique is a two-step process. The first stage consists in generating the predicted probability for voluntary work by estimating Eq. (4) using a probit model. In the second stage, the predicted probability is used to replace V_i variable in Eq. (3) and the model is estimates by ordinary least-squares (OLS).

4. Data

The data for this study come from the European Union Statistics on Income and Living Conditions (EU-SILC) dataset. The EU-SILC database provides comparable, cross sectional and longitudinal multidimensional data on income, social exclusion and living conditions performed in Member States (MS) of the European Community. The reference population of EU-SILC is all private households and their current heads residing in the territory of the MS at the time of data collection. The EU-SILC data is thus a national representative sample of all person aged 16 and over residing in private households within the country. Four types of data are gathered in EU-SILC: 1) variables measured at the household level; 2) information on household size and composition and basic characteristics of household heads; 3) income and other more complex variables measured at the personal level, but aggregated to construct household-level variables; 4) variables collected at the personal level. The items included in the micro data regards health, education, childcare, housing, demographic and employment characteristics, income.

The paper uses 2006 wave of EU-SILC, which provides information on the labour market characteristics of individuals as well as their social participation. The information on social participation is self-assessed by the individual who is asked to report i) frequency of getting/being in contact with friends and relatives; ii) participation in informal and formal voluntary activities; iii) participation in cultural events.

Our attention is restricted to employees who supply voluntary work in formal organizations. The original sample contains 46522 observations. After excluding individuals who were not employees, we were left with a subsample of 15169 employees, of whom 1239 were volunteers and 13930 were non-volunteers, who were aged between 16 and 64 in 2006. All the variables used in the analysis are described in detail in Appendix A. Weighted summary statistics are reported in Table 1.

The dependent variable of the wage equation is the natural logarithm of employee income (py010n). Employee income is defined as the total remuneration, in cash, payable by an employer to an employee in return for work done by the latter during the reference period. The survey reports after-tax income and no information on the different tax rates.

The micro data contains a question, ps150, in which the individual reports if he/she, during the last twelve months, participated in the unpaid work of charitable organizations, groups or clubs. The voluntary work dummy takes the values of 1 if the worker participated in the unpaid work of charitable organizations, groups or clubs and 0 otherwise. The voluntary work dummy includes only respondents who supply unpaid work, and doesn't include other organisation members who do not perform unpaid work. As in previous studies, the data do not provide any information on the number of hours that the individual spent in formal voluntary activities.

A convincing analysis requires that at least one variable in equations (2) and (4) is excluded from wage equation (3).

In order to find instruments for the voluntary work equation, the following questions are used: if the respondent, during the last twelve months, i) participated in activities of religious organizations (activities related to churches, religious communions or associations) or other groups (environmental organizations, civil right groups, neighbourhood associations, peace groups, etc…)(Religious or other groups participation);[2] ii) undertook (private) every week voluntary activities to help someone, such as cooking for others; taking care of people in hospitals/at home; taking people for a walk (Informal Help). The dummy variables are set to 1 if the individuals responded "yes".

While it seems reasonable that these variables increase the likelihood to supply voluntary work in formal organizations, it is not obvious that they have no effect on earnings. Instrumental variables should satisfy two conditions: highly significant correlation with voluntary work (strength of the instrument) and no correlation with the error term in the structural equation (validity condition). A number of tests can be run in order to check the strength and indirect validity of the instrumental variables used for voluntary work and we will present them in the empirical results.

[2] The variable includes respondents who participated to religious associations "or" to other groups (environmental organizations, civil right groups, neighborhood associations, peace groups etc). In the variable construction have been excluded respondents participating at least to one of the two categories (religious and other groups).

The second requirement for reliable instrumental variables cannot be tested directly as it involves a relationship between instruments and the error term. Hence, we rely on the following theoretical considerations and intuitions.

The first variable, religious or other groups participation dummy, concerns participation in various organizations. Membership and participation in these kinds of associations can promote coordination and civic culture, and it is reasonable to argue that these behaviours affect the probability of engaging in voluntary activities. Furthermore, persons attending relational networks are socially integrated and are more likely to hear about volunteer opportunities or meet other volunteers (Wilson, 2012). Nevertheless, it seems arguable that the extensive field of interest of these organizations avoids skill complementarities between members that can be useful for labour market outcomes. The same may not be true for political or professional associations or unions: membership in a professional association or union is strictly linked to working status and earning function, the same being true for people attending the meetings of political parties that may be motivated by lobby interests.

Religion deserves further considerations. Existing analyses on religion and income concern both the effect of religion on income and the inverse relationship. Theoretical explanations involve beliefs, opportunity cost of time and network effects. Most studies focus on the differences effect between denominations (Jewish, Catholic, Protestant, etc…), whereas other studies analyse church membership. The results are positive for the Jewish beliefs and mixed for other denominations and for church attendance (Bettendorf and Dijkgraaf 2011). Tomes (1985) shows earning differentials by religion, attributable to different returns to human capital. The higher return to human capital is generated in stronger family backgrounds in terms of values, skills and goals. The same family impact is found in Steen (2004) especially for Catholics and Jews. Note that both analyses are focused on the different impact of religious attitudes (and family's religion) and not of the choice to be religious or not, that is church attendance and/or the participation to religious association when one is adult. It seems that is more important the family training than the individual choice for a religious participation: Cornelissen and Jirjahn (2012) show that "people who are raised religiously and reject religion as adults are economically more successful as they combine a strong internalized work ethic with an increased interest in present consumption (as opposed to afterlife consumption)". Regarding the inverse relationship, Sawkins et al. (1997) find a positive relationship between labour income and church attendance using micro-data for Great Britain. However, as suggested by Lepford and Tollison (2003), there might be a bicausal relation between religion and income when one would consider the endogeneity of religion. Lepford and Tollison using macro-data on US in a system of equations find that the effect of church membership on income is negative as well as the

effect of income on church membership, whereas Bettendorf and Dijkgraaf (2011), using micro-data for Netherlands show that the cross-effects between income and church attendance get insignificant in a joint regression model.

Summing up, previous studies on religion and income focus on different denominations and church attendance, and show mixed findings. Our variable of religious participation includes both church attendance and other activities related to churches, religious communions or associations. Being a wider concept of participation to religious associations, we are confident that our variable of "religious participation" is uncorrelated with income, based on the following considerations.

First of all, the wider definition of religious participation better captures the networking effects of associational participation above discussed for all the organizations considered. The argument of absence of skill complementarities still holds.

Second, religious participation as church attendance signals an individual preference for afterlife consumption: this implies that religious participants place a relatively lower valuation on market earnings (Lipford and Tollison, 2003), which is confirmed in the joint regression model of Bettendorf and Dijkgraaf (2011).

Finally, the family training effects, which are variable among religions, should be less important in Italy where Catholic religion is surely prevalent. If family training effects exist, they should be uniform and eventually captured by the educational variables, through background effects.

The second instrumental variable concerns the informal help variable as cooking, walking and being with others. It seems reasonable that intrinsic motivation that incentives to volunteering (Bruno, Fiorillo, 2012), encourages also to these informal help activities. This argument is supported by Hank and Stuck (2007) results, showing a complementary and interdependent relationship between volunteering, helping, and caring, supporting notions of the existence of a motivation for engagement. On the other hand, activities of informal help do not require expensive material goods to be carried out, and the relationship with income availability can be ignored. The opportunity cost of time used to accomplish these tasks is equally irrelevant, because the frequency requested is a weekly effort for very easy tasks.

In order to identify the exclusion variables for the labour force participation equation, we use three dummy variables: if the respondent, during the last twelve months, perceived a social pension, a disability pension and a civil disability pension. In a standard labour supply model, these income-support schemes discourage labour force participation and are not included in labour income.

A number of variables are included in the wage equation. These variables are standard in empirical applications of the human capital model: demographic characteristics (gender, marital status, age, education, family size, number of children, health, homeownership), working

Table 1. Descriptive statistics

	All sample		Volunteers		Non volunteers	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Voluntary activities	0.08	0.26				
Labour income (ln)	9.61	0.59	9.73	0.59	9.60	0.59
Male	0.57	0.49	0.54	0.50	0.57	0.49
Married	0.59	0.49	0.59	0.49	0.60	4.49
Separated	0.02	0.16	0.03	0.18	0.02	0.15
Divorced	0.03	0.16	0.02	0.15	0.03	0.16
Widowed	0.01	0.12	0.01	0.11	0.01	0.12
Age	40.0	10.41	41.76	10.20	39.85	10.41
Low secondary edu	0.31	0.46	0.21	0.41	0.32	0.47
Upper secondary edu	0.37	0.48	0.37	0.48	0.37	0.48
Post secondary edu	0.08	0.27	0.11	0.31	0.08	0.27
University edu	0.16	0.37	0.27	0.45	0.15	0.36
Household size	3.14	1.22	3.01	1.19	3.15	1.23
Children 0 - 2	0.09	0.31	0.05	0.24	0.10	0.31
Children 3 - 5	0.10	0.31	0.08	0.29	0.10	0.31
Children 6 - 15	0.35	0.63	0.35	0.63	0.35	0.63
Children 16 - 24	0.40	0.69	0.39	0.65	0.41	0.70
Good health	0.74	0.44	0.71	0.45	0.74	0.43
Homeowner	0.71	0.45	0.79	0.41	0.70	0.46
Weakly hours	37.77	8.70	36.95	8.96	37.84	8.67
Labour experience	16.08	10.27	17.64	10.50	15.95	10.24
Permanent contract	0.84	0.36	0.87	0.33	0.84	0.36
Firm size						
> 10 and < 20 employees	0.15	0.36	0.15	0.35	0.15	0.36
> 19 and < 50 employees	0.14	0.35	0.17	0.37	0.14	0.35
0.> 49 employees	0.35	0.47	0.44	0.50	0.34	0.47
Job-Professional	0.33	0.47	0.48	0.50	0.32	0.47
Job-Skilled	0.30	0.46	0.27	0.44	0.30	0.46
Agriculture	0.03	0.18	0.01	0.12	0.04	0.19
Construction	0.07	0.25	0.03	0.16	0.07	0.26
Wholesale	0.10	0.30	0.06	0.24	0.11	0.31
Hotels	0.03	0.17	0.02	0.14	0.03	0.17
Transport	0.05	0.23	0.05	0.22	0.05	0.23
Finance	0.03	0.18	0.04	0.19	0.03	0.18
Real estate	0.06	0.23	0.02	0.16	0.06	0.23
Education	0.09	0.29	0.16	0.37	0.08	0.28
Public administration	0.10	0.30	0.11	0.32	0.10	0.30
Health and social work	0.08	0.27	0.16	0.36	0.07	0.26
Other sectors	0.08	0.28	0.09	0.29	0.08	0.28
Densely populated area	0.44	0.50	0.41	0.49	0.44	0.50
Intermediate area	0.39	0.49	0.39	0.49	0.39	0.49
North East	0.22	0.41	0.27	0.45	0.21	0.41
Centre	0.20	0.40	0.19	0.39	0.20	0.40
South	0.19	0.39	0.17	0.37	0.19	0.39
Islands	0.09	0.29	0.07	0.25	0.09	0.29
Observation	15169		1239		13930	

characteristics (weekly hours, experience, permanent job), firm size, occupation, sector of activity and territorial dummies.

In the all sample the proportion of working individuals who supply voluntary work in formal organizations is 8%. Table 1 reports characteristics of volunteers and non-volunteers. Volunteers, on average, are older, have higher high school degree, more labour market experience, are employed in professional occupations and in large firms, are employed in public sector and live in the north. Finally, it should be also noted that the average labour income (in log) for volunteers is higher than non-volunteers, i.e. 9.73 and 9.60, respectively.

5. Empirical results

Table 2 presents the OLS results of the wage function (equation 1). In Column (1) we present a specification that includes the voluntary work dummy variable and some control variables: gender, marital status, age, education (two dummies), family size, number of children, health, homeowner, weekly hours, experience, permanent job, municipal dummies. The coefficient on the volunteering variable is statistically significant (5%) and indicates that the wage premium associated with voluntary work is 2.9 percent. This finding is of limited use given the lack of other relevant independent variables. However, it can be compared with the result of Hackl et al. (2007, 88). Using a parsimonious specification Hackl and co-authors, with Austrian data, find that in 2001 the wage premium for volunteers amounted to 23,6 percent. These figures seem to suggest that the return to volunteering is significantly lower. Other education dummy variables are added in Column (2). The coefficient on the voluntary work dummy variable is no longer statistically significant and its value is lower than the corresponding value in Column (1). The rate of return to voluntary work disappears when we control for all education dummy variables. A number of job characteristics and territorial dummy variables are included in Column (3). The coefficient on volunteering is still not statistically significant and presents a negative sign. Hence, in the wide specification as in Day and Devlin (1998) we do not find a wage premium for voluntary work supplied in formal organizations.

The empirically findings on the other independent variables are generally consistent with previous studied. The labour income of males is higher than that of females and married employees have higher wage than single workers. The effect of education on labour income is in line with the expectations: the higher is the educational level, the higher is the income level of an employee. The larger is the number of hours worked per week, the higher is labour income. These results are in line with findings of Day and Devlin (1998). Moreover, as in Hackl et al. (2007), the greater is the labour experience on paid work, the higher is wage.

Table 2. Ordinary least-squares estimates of the effect of volunteering on labour income

	(1)		(2)		(3)	
	Coeff.	SE	Coeff.	SE	Coeff.	SE
Voluntary work	0.029**	0.015	0.009	0.015	-0.012	0.014
Male	0.206***	0.009	0.203***	0.009	0.200***	0.009
Married	0.055***	0.010	0.058***	0.010	0.052***	0.010
Separated	0.059**	0.029	0.056*	0.029	0.040	0.028
Divorced	0.051**	0.023	0.046**	0.023	0.040*	0.022
Widowed	0.023	0.029	0.040	0.028	0.041	0.026
Age	0.010***	0.001	0.009***	0.001	0.009***	0.001
Low secondary edu	-0.099***	0.012	0.166***	0.019	0.115***	0.018
Upper secondary edu	-0.025***	0.010	0.279***	0.020	0.193***	0.018
Post secondary edu			0.286***	0.022	0.186***	0.021
University edu			0.477***	0.023	0.347***	0.022
Household size	-0.022***	0.004	-0.018***	0.004	-0.012***	0.004
Children 0 - 2	0.069***	0.013	0.056***	0.013	0.040***	0.012
Children 3 - 5	0.064***	0.012	0.061***	0.012	0.056***	0.011
Children 6 - 15	0.047***	0.007	0.041***	0.007	0.038***	0.007
Children 16 - 24	-0.019***	0.008	-0.019***	0.007	-0.014**	0.007
Good health	0.046***	0.009	0.034***	0.009	0.035***	0.008
Homeowner	0.095***	0.009	0.079***	0.009	0.058***	0.009
Weakly hours	0.017***	0.001	0.017***	0.001	0.017***	0.001
Labour experience	0.004***	0.001	0.007***	0.001	0.005***	0.001
Permanent contract	0.416***	0.016	0.399***	0.016	0.343***	0.016
Firm size						
> 10 and < 20 employees					0.070***	0.011
> 19 and < 50 employees					0.134***	0.012
.> 49 employees					0.167***	0.010
Job-Professional	0.320***	0.011	0.292***	0.011	0.208***	0.012
Job-Skilled	0.161***	0.010	0.151***	0.010	0.142***	0.011
Agriculture					-0.244***	0.028
Construction					-0.025	0.017
Wholesale					-0.074***	0.015
Hotels					-0.251***	0.032
Transport					0.053***	0.017
Finance					0.203***	0.025
Real estate					-0.091***	0.020
Education					0.075***	0.016
Public administration					0.076***	0.013
Health and social work					0.037**	0.015
Other sectors					-0.082***	0.016
Densely populated area	0.078***	0.011	0.097***	0.011	0.033***	0.010
Intermediate area	0.034***	0.010	0.037***	0.010	0.010	0.010
North East					-0.013	0.010
Centre					-0.025**	0.010
South					-0.099***	0.012
Islands					-0.089***	0.018
No. of observations	14699		14699		14697	
R-squared	0.360		0.374		0.427	

Note. The symbols ***, **, * denote coefficient statistically different from zero at the 1, 5 and 10 percent.

Different from the results of Day and Devlin (1998) and Hackl et al. (2007), household size has a negative effect on wage, statistically significant at 5 percent, while the numbers of children aged between 0 and 15 years old have a positive effect on labour income. As in Prouteau and Wolff (2006) and in studies following Mincerian approach (Di Pietro 2007), working in big firms and in professional/skilled occupations results in a higher income.

Finally, the coefficients on territorial dummy variables, which are included to capture any macro-regional specific differences in labour income, are consistent with the pattern of regional differences in Italy.

Table 3 presents the estimates for OLS wage function (equation 3) with selection correlations on labour force participation[3]. We find that the coefficient on λ_1 is statistically significant (1%) and negative in the three regressions (Column (1) – (3)). This means that there is an overestimation of the wage premium, if we do not correct for labour market participation. Indeed, in Column (1), we can observe that when we correct for selectivity problem the size of the coefficient on the voluntary work decreases, from 0.029 in Table 2 to 0.022 in Table 3, and the coefficient on this variable is no longer statistically significant. On the other hand, in all Columns, the results for the other explanatory variables are stable and unchanged relative to those reported in Table 2.

In Table 4 the Instrumental Variable method is used to account for the endogeneity bias. Let us consider the selection term first. In all Columns, the coefficient on λ_1 is still statistically significant at 1 percent with the negative sign. These results corroborate the relevance to account for the selectivity bias related to the labour market participation. Moreover, the coefficient on the voluntary work dummy variable increases its value and it is statistically significant at 1 percent as we control for endogeneity bias. Remarkably, the bias leads to underestimation of the absolute size of the coefficient of interest. As expected, voluntary work has a positive effect on labour income. The estimate in Column (3) shows that the wage premium of volunteering is 3.7 percent. The findings for the other explanatory variables are stable and unchanged compared to those reported in Table 3.

[3] The estimates of the selection equation for labour market participation are shown in Appendix B, Table B1.

Table 3. Ordinary least-squares estimates of the effect of volunteering on labour income with inverse Mills ratio

	(1)		(2)		(3)	
	Coeff.	SE	Coeff.	SE	Coeff.	SE
Voluntary work	0.022	0.015	0.009	0.015	-0.011	0.014
Male	0.138***	0.010	0.162***	0.010	0.172***	0.010
Married	0.065***	0.010	0.064***	0.010	0.055***	0.010
Separated	0.030	0.029	0.041	0.029	0.031	0.028
Divorced	0.023	0.023	0.030	0.023	0.030	0.022
Widowed	0.118***	0.029	0.092***	0.028	0.074***	0.027
Age	0.007***	0.001	0.007***	0.001	0.008***	0.001
Low secondary edu	-0.076***	0.012	0.114***	0.020	0.082***	0.019
Upper secondary edu	-0.026***	0.009	0.204***	0.021	0.146***	0.020
Post secondary edu			0.192***	0.024	0.126***	0.024
University edu			0.380***	0.025	0.286***	0.024
Household size	-0.014***	0.004	-0.014***	0.004	-0.011***	0.004
Children 0 - 2	0.040***	0.013	0.041**	0.013	0.032***	0.012
Children 3 - 5	0.029**	0.012	0.041***	0.012	0.043***	0.012
Children 6 - 15	0.022***	0.007	0.027***	0.007	0.029***	0.007
Children 16 - 24	-0.009	0.007	-0.013*	0.007	-0.011	0.007
Good health	-0.003	0.009	0.007	0.009	0.017**	0.009
Homeowner	0.095***	0.009	0.083***	0.009	0.061***	0.009
Weakly hours	0.017***	0.001	0.017***	0.001	0.017***	0.001
Labour experience	0.005***	0.001	0.007***	0.001	0.005***	0.001
Permanent contract	0.391***	0.016	0.389***	0.016	0.339***	0.016
Firm size						
> 10 and < 20 employees					0.068***	0.011
> 19 and < 50 employees					0.131***	0.012
.> 49 employees					0.166***	0.010
Job-Professional	0.292***	0.011	0.229***	0.012	0.209***	0.012
Job-Skilled	0.151***	0.010	0.126***	0.010	0.144***	0.011
Agriculture					-0.244***	0.028
Construction					-0.023	0.017
Wholesale					-0.073***	0.014
Hotels					-0.249***	0.032
Transport					0.052***	0.017
Finance					0.203***	0.026
Real estate					-0.091***	0.020
Education					0.077***	0.016
Public administration					0.076***	0.013
Health and social work					0.037**	0.015
Other sectors					-0.082***	0.016
Densely populated area	0.097***	0.011	0.079***	0.011	0.043***	0.010
Intermediate area	0.037***	0.010	0.031***	0.010	0.013	0.010
North East					-0.014	0.010
Centre					-0.021**	0.010
South					-0.082***	0.013
Islands					-0.068***	0.018
λ_1	-0.233***	0.014	-0.139***	0.015	-0.091***	0.016
No. of observations	14699		14699		14697	
R-squared	0.374		0.387		0.428	

Note. The symbols ***, **, * denote that the coefficient is statistically different from zero at the 1, 5 and 10 percent.

Table 4. IV estimates of the effect of voluntary work on labour income with inverse Mills ratio

	(1)		(2)		(3)	
Variable	Coeff.	SE	Coeff.	SE	Coeff.	SE
Voluntary work	0.054***	0.014	0.044***	0.014	0.037***	0.014
Male	0.137***	0.010	0.161***	0.010	0.169***	0.010
Married	0.069***	0.010	0.067***	0.010	0.057***	0.010
Separated	0.032	0.029	0.042	0.029	0.033	0.028
Divorced	0.030	0.023	0.037	0.023	0.036	0.022
Widowed	0.128***	0.029	0.100***	0.029	0.080***	0.027
Age	0.007***	0.001	0.007***	0.001	0.008***	0.001
Low secondary edu	-0.064***	0.012	0.104***	0.020	0.075***	0.019
Upper secondary edu	-0.021**	0.010	0.185***	0.021	0.132***	0.020
Post secondary edu			0.166***	0.026	0.106***	0.025
University edu			0.350***	0.026	0.264***	0.025
Household size	-0.012***	0.004	-0.013***	0.004	-0.010**	0.004
Children 0 - 2	0.046***	0.013	0.047***	0.013	0.038***	0.013
Children 3 - 5	0.030**	0.012	0.042***	0.012	0.045***	0.012
Children 6 - 15	0.019***	0.007	0.025***	0.007	0.028***	0.007
Children 16 - 24	-0.011	0.007	-0.014**	0.007	-0.012	0.007
Good health	-0.000	0.009	0.010	0.009	0.020**	0.009
Homeowner	0.087***	0.010	0.077***	0.010	0.056***	0.009
Weakly hours	0.017***	0.001	0.017***	0.001	0.017***	0.001
Labour experience	0.005***	0.001	0.007***	0.001	0.005***	0.001
Permanent contract	0.389***	0.016	0.388***	0.016	0.340***	0.016
Firm size						
> 10 and < 20 employees					0.069***	0.011
> 19 and < 50 employees					0.130***	0.012
> 49 employees					0.163***	0.010
Job-Professional	0.277***	0.012	0.222***	0.012	0.204***	0.012
Job-Skilled	0.143***	0.011	0.123***	0.010	0.141***	0.011
Agriculture					-0.228***	0.029
Construction					-0.017	0.017
Wholesale					-0.069***	0.015
Hotels					-0.253***	0.032
Transport					0.049***	0.017
Finance					0.199***	0.026
Real estate					-0.079***	0.020
Education					0.072***	0.016
Public administration					0.075***	0.013
Health and social work					0.027*	0.016
Other sectors					-0.090***	0.016
Densely populated area	0.107***	0.011	0.088***	0.011	0.051***	0.011
Intermediate area	0.043***	0.010	0.036***	0.010	0.018*	0.010
North East					-0.019*	0.010
Centre					-0.018*	0.010
South					-0.078***	0.013
Islands					-0.063***	0.019
λ_1	-0.234***	0.014	-0.140***	0.015	-0.092***	0.016
No. of observations	14699		14699		14697	
R-squared	0.374		0.387		0.429	

Note. The symbols ***, **, * denote coefficient statistically different from zero at the 1, 5 and 10 percent.

In order to check the strength of the instrumental dummy variables, we run the following test: we regress, through a probit model, the voluntary work dummy variable on religious or other groups participation dummy variable, informal help dummy variable and all other exogenous variables from the structural equation. The coefficients on the instrumental variables are significantly different from zero at the level of 1 percent (p-values 0.00 and 0.00) with positive signs in all Columns (see Appendix B, Table B2). The chi-square statistics for joint significance of the instruments are, respectively, 391.29, 380.43 and 372.13.

We also test the correlation between our instrumental variables and voluntary work using the F-test suggested by Staiger and Stock (1997). The F-statistic for joint significance of the instruments in the first stage of the endogenous variable on the instruments and all other exogenous variables is 135, 57 in Column (1), 132.30 in Column (2) and 130.16 in Column (3), well above the threshold of 10 suggested by Staiger and Stock (1997). Thus, we can conclude that our instrumental dummy variables are not weak.

The validity condition is indirectly checked using a Sargan test. The residuals from the IV estimate are regressed on the instrumental dummy variables and all other exogenous variables. The R-squared is extremely small in all regressions (0.00000019, 0.00000007 and 0.00004068) indicating that the instruments do not explain any significant variations in the residual, suggesting the validity of at least one instrument.

Finally, we also run a Hausman test in order to test the endogeneity of voluntary work dummy variable. The check is performed by including the residuals of the voluntary work equation in the OLS wage equation. A F-statistic on whether the coefficient on residuals is statistically significant indicates the endogeneity of voluntary work dummy variable. The result shows that the F-statistic in IV estimate is high (respectively, 12.57, 9.07 and 8.09) suggesting that voluntary work dummy variable is endogenous.

6. Discussion

Using a sample of Italian employees from the 2006 European Union Statistics on Income and Living Conditions (EU-SILC) dataset, this paper tries to answer to three questions about wage premium for volunteers: the existence of a wage premium, its size and the channel through which volunteering determines higher wages.

Previous analyses prove that volunteers earn higher income compared to non-volunteers, also without considering self-selection and endogeneity bias. The present analysis shows that by using a wide set of variables the wage premium disappears in the basic estimates of Table 2. The wage

premium emerges when unobserved heterogeneity is taken into account. These results highlight that three problems must be taken into account when analyzing the returns to volunteering: the need for wide sets of variables, the unobserved worker heterogeneity and the reverse causality between volunteering and income.

The size of the wage premium is important to assess the relevance of the investment motives in volunteering. Previous studies found wage premium ranging from 7 to 18,5 percent. This paper proves that the size of the wage premium is influenced by the selectivity bias related to the labour force participation. The overestimation effect of not considering the selection bias emerges when comparing Column (1) in Table 2 and Table 3. When considering selection bias problem and endogeneity issue, the estimate in Column (3) of Table 4 shows that the wage premium of volunteering is 3.7 percent, which is a very low premium, compared to previous analyses. This result is supported by the findings of Bruno and Fiorillo (2012), underlying that in volunteers' behaviour the consumption motive prevails on the investment motive, relatively less strong in determining choices. Though a selectivity bias can explain the distance with the 7% premium of Day and Devlin (1997), further analyses are needed to explain larger variability across countries.

As in Day and Devlin (1998), while showing the existence of a wage premium, we are not able to discern among the three different channels of influence of volunteering on income.

The human capital hypothesis underlines that volunteers acquire skills and experience and become more productive. The wage premium for volunteering is the effect of this human capital accumulation. The best predictor for human capital effects of volunteering would be the past experience in volunteer activities: a significant effect of past experience should support the efficacy of this channel. Unfortunately, the EU-SILC data set doesn't contain information on past volunteering. The labour experience variable is significant as expected, confirming the human capital accumulation through labour market work.

The second channel of influence of volunteering on wages underlines that volunteering may influence earnings by providing a signal to employers of otherwise unobservable abilities (the screening hypothesis). This hypothesis implies that the wage premium is associated to unobservable characteristics, which individual signals to the employer through volunteering. Hackl et al. (2007) found in their data that a problem of self-selection of volunteers exists, indirectly strengthening the screening hypothesis, but their analysis doesn't control for self-selection in labour market participation. It is easily arguable that the choice to participate to the labour market is prior to the choice to volunteer in order to obtain a signalling effect and a higher remuneration in the labour market. We run a Chow test to verify the pooling hypothesis between volunteers and non-volunteers:

the pooling hypothesis is accepted, implying that volunteers do not differ statistically from non-volunteers. This result should reduce the relevance of the screening hypothesis.

Through the third channel volunteering may provide access to informal networks of contacts (the networking hypothesis). Prouteau and Wolff (2004) underline a relational motive to explain participation and volunteering in associations. Two possible relationships between volunteering and social networks emerge: individuals volunteer to acquire useful networks, providing chances to better jobs (instrumental relations), but individuals may also participate to associations and networks in order to consume relational goods (intrinsically enjoyed relations) and consequently find the chance to volunteer. Beyond the relational motive, it is reasonable that many persons volunteer when they are requested to do so (Freeman, 1997), and this is likely to happen in religious, environmental, civic and cultural associations. In the IV approach we find the significance of religious or other groups participation dummy variable on the voluntary work dummy variable. This supports the networking motive for volunteering, also if it does not exclude an instrumental use of networks for monetary purposes.

7. Conclusion

The effects of voluntary work on earnings have recently been studied for some developed countries such as Canada, France and Austria. This paper extended this line of research for Italy using data from the European Union Statistics on Income and Living Conditions (EU-SILC) dataset. A double methodological approach is used in order to control for unobserved heterogeneity: Heckman and IV methods are employed to account for unobserved worker heterogeneity and endogeneity bias.

Empirical results show that a wage premium of 3.7 percent of annual labour income emerges when the unobserved heterogeneity is taken into account. These findings indicate that a self-selection correction for labour market participation should be used when estimating the pay differential between volunteers and non-volunteers. Furthermore, accounting for endogeneity bias, the results also indicate that the wage premium in Italy is quite small if compared to previous investigations on Canada and Austria. Future research on this last evidence is welcome in order to determine why this is the case.

Finally, discussion about the three different channels of influence of volunteering on income is not conclusive. Some clues on the relevance of the networking hypothesis emerge from the empirical analysis, whereas the screening hypothesis is not confirmed.

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Appendix A. Variable definitions

Variable	*Description*
Dependent variable	
Labour income (ln)	Natural log of annual net labour income
Key independent variable	
Voluntary work	Dummy, 1 if the respondent, during the last twelve months, participated in the unpaid work of charitable organizations, groups or clubs. It includes unpaid charitable work for churches, religious groups and humanitarian organizations. Attending meetings connected with these activities is included; 0 otherwise
Sample selection and instrumental variables	
Social pension	Dummy, 1 If the respondent, in 2005, perceived a social pension or a social allowance; 0 otherwise
Disability pension	Dummy, 1 If the respondent, in 2005, perceived a disability pension or a disability allowance; 0 otherwise
Civil disability pension	Dummy, 1 If the respondent, in 2005, perceived a civil disability pension ; 0 otherwise
Religious or other groups participation	Dummy, 1 If the respondent, during the last twelve months, participated in activities related to churches, religious communions or associations or other groups (environmental organizations, civil right groups, neighborhood associations, peace groups, etc.); 0 otherwise
Informal help	Dummy, 1 if the respondent, during the last twelve months, undertook every week (private) voluntary activities to help someone, such as cooking for others; taking care of people in hospitals/at home; taking people for a walk. It excludes any activity that a respondent undertakes for his/her household, in his/her work or within voluntary organizations
Demographic and socio-economic characteristics	
Male	Dummy, 1 if male; 0 otherwise**. Reference group: female**
Married	Dummy, 1 if married; 0 otherwise; **Reference group: single status**
Separated	Dummy, 1 if separated; 0 otherwise
Divorced	Dummy, 1 if divorced; 0 otherwise
Widowed	Dummy, 1 if widowed; 0 otherwise
Age	Age of the respondent between 16 and 64
Low secondary edu	Dummy, 1 if the respondent has attained lower secondary school; 0 otherwise. **Reference group: No educational attained and primary school degree**
Upper secondary edu	Dummy, 1 if the respondent has attained upper secondary school degree; 0 otherwise.
Post secondary edu	Dummy, 1 if the respondent has attained post secondary school degree; 0 otherwise.
University edu	Dummy, 1 if the respondent has attained tertiary education or higher; 0 otherwise
Household size	Number of household heads
Children 0 -2	Number of own children ages 0 - 2 years old. **Reference group: no children**
Children 3 -5	Number of own children ages 3 - 5 years old
Children6 - 15	Number of own children ages 6 - 15 years old
Children16 -24	Number of own children ages 16 and 24 attending school
Good health	Dummy, 1 if the respondent perceives his/her health as good or very good; 0 otherwise
Homeowner	Dummy, 1 if the respondent owns the house where he /she lives; 0 otherwise

Variable	*Description*
Worker characteristics	
Weekly hours	Number of hours usually worked per week in main job
Labour market experience	Number of years, since starting the first regular job, that the respondent has spent at work
Permanent job	Dummy, 1 if the respondent has a work contract of unlimited duration; 0 otherwise
Firm size	
> 10 and <20 employees	Dummy, 1 if the number of persons working at the local unit is between 11 and 19; 0 otherwise. **Reference group: = or < 10 employees**
>19 and <50 employees	Dummy, 1 if the number of persons working at the local unit is between 20 and 19; 0 otherwise.
> 49 employees	Dummy, 1 if the number of persons working at the local unit is equal or more than 50; 0 otherwise.
Occupation	
Job-Professional	Dummy, 1 if the respondent is employed in professional and/or managerial occupation; 0 otherwise; **Reference group: Job-No skilled**
Job-Skilled	Dummy, 1 if the respondent is employed in skilled occupation; 0 otherwise;
Sector	
Agriculture	Dummy, 1 if the activity sector is agriculture: 0 otherwise. **Reference group**: **manufacturing**
Construction	Dummy, 1 if the activity sector is construction: 0 otherwise
Wholesale	Dummy, 1 if the activity sector is wholesale and : 0 otherwise
Hotels	Dummy, 1 if the activity sector is hotels and restaurants: 0 otherwise
Transport	Dummy, 1 if the activity sector is transport: 0 otherwise
Finance	Dummy, 1 if the activity sector is finance intermediation: 0 otherwise
Real Estate	Dummy, 1 if the activity sector is real estate: 0 otherwise
Education	Dummy, 1 if the activity sector is education: 0 otherwise
Public administration	Dummy, 1 if the activity sector is public administration: 0 otherwise
Health and social work	Dummy, 1 if the activity sector is health and social work: 0 otherwise
Other sectors	Dummy, 1 if the activity sector is another sector: 0 otherwise
Territorial dummies	
Densely populated area	Dummy, 1 it the respondent lives in local areas where the total population for the set is at least 50,000 inhabitants. **Reference group: Thinly-populated area**
Intermediate area	Dummy, 1 it the respondent lives in local areas, not belonging to a densely-populated area, and either with a total population for the set of at least 50,000 inhabitants or adjacent to a densely-populated area.
North East	Dummy, 1 if the respondent lives in North east regions; 0 otherwise. **Reference group: North West**
Centre	Dummy, 1 if the respondent lives in Central regions; 0 otherwise
South	Dummy, 1 if the respondent lives in Southern regions; 0 otherwise
Islands	Dummy, 1 if the respondent lives in the Islands; 0 otherwise

Appendix B.

Table B1. Labour force participation equation

Variable	Coeff.	SE
Social pension	-0.891***	0.193
Disability pension	-0.821***	0.075
Civil disability pension	-1.093***	0.080
Male	0.662***	0.014
Married	-0.267***	0.019
Separated	-0.061	0.055
Divorced	0.007	0.055
Widowed	-0.564***	0.039
Age 30-39	1.279***	0.023
Age 40-49	1.564***	0.023
Age 50-59	1.227***	0.022
Age 60-64	0.209***	0.032
Low secondary edu	0.411***	0.022
Upper secondary edu	0.749***	0.022
Post secondary edu	1.037***	0.035
University edu	1.115***	0.030
Household size	0.020***	0.008
Children 0 - 2	0.051	0.033
Children 3 - 5	0.116	0.030
Children 6 - 15	0.002	0.014
Children 16 - 24	-0.039***	0.012
Good health	0.332***	0.016
Homeowner	-0.080***	0.017
Densely populated area	-0.176***	0.019
Intermediate area	-0.040**	0.018
North East	0.011	0.021
Centre	-0.060***	0.021
South	-0.326***	0.022
Islands	-0.420***	0.029
No. of observations	46338	
R-squared	0.341	
Log Likelihood	-20919.83	

Note. The symbols ***, ** denote that the coefficient is statistically different from zero at the 1 and 5.

Table B2. Voluntary work equation

	(1)		(2)		(3)	
Variable	Coeff.	SE	Coeff.	SE	Coeff.	SE
Religious or other groups participation	0.444***	0.047	0.437***	0.047	0.573***	0.034
Informal help	0.568***	0.034	0.563***	0.034	0.418***	0.048
Male	0.037	0.035	0.035	0.035	0.079**	0.036
Married	-0.073*	0.043	-0.069	0.043	-0.057	0.044
Separated	-0.013	0.101	-0.015	0.101	-0.023	0.101
Divorced	-0.127	0.103	-0.125	0.103	-0.131	0.105
Widowed	-0.182	0.133	-0.157	0.134	-0.136	0.134
Age	-0.000	0.003	-0.000	0.003	0.001	0.003
Low secondary edu	-0.211***	0.044	0.237***	0.085	0.179**	0.086
Upper secondary edu	-0.083**	0.035	0.411***	0.086	0.338***	0.087
Post secondary edu			0.541***	0.095	0.451***	0.097
University edu			0.629***	0.094	0.515***	0.096
Household size	-0.042**	0.017	-0.039**	0.017	-0.030*	0.017
Children 0 - 2	-0.098	0.063	-0.111*	0.063	-0.135**	0.063
Children 3 - 5	-0.040	0.058	-0.041	0.059	-0.053	0.060
Children 6 - 15	0.028	0.028	0.020	0.028	0.010	0.028
Children 16 - 24	0.023	0.026	0.022	0.027	0.024	0.027
Good health	-0.049	0.036	-0.061*	0.036	-0.065*	0.037
Homeowner	0.160***	0.038	0.142***	0.038	0.137***	0.009
Weakly hours	-0.001	0.002	-0.001	0.002	-0.000	0.002
Labour experience	0.007**	0.003	0.010***	0.003	0.007**	0.003
Permanent contract	0.047	0.046	0.022	0.046	-0.020	0.048
Firm size						
> 10 and < 20 employees					- 0.008	0.049
> 19 and < 50 employees					0.048	0.050
> 49 employees					0.080**	0.040
Job-Professional	0.264***	0.042	0.151***	0.046	0.116**	0.049
Job-Skilled	0.144***	0.043	0.084*	0.044	0.080*	0.048
Agriculture					-0.409***	0.134
Construction					-0.128	0.081
Wholesale					-0.089	0.066
Hotels					0.116	0.102
Transport					0.095	0.075
Finance					0.104	0.088
Real estate					-0.289***	0.089
Education					0.101	0.067
Public administration					0.020	0.061
Health and social work					0.254***	0.062
Other sectors					0.205***	0.062
Densely populated area	-0.157***	0.041	-0.171***	0.041	-0.185***	0.042
Intermediate area	-0.096**	0.038	-0.103***	0.038	-0.117***	0.039
North East					0.093**	0.043
Centre					-0.082*	0.045
South					-0.148***	0.053
Islands					-0.185***	0.074
No. of observations	15163		15163		15157	
R-squared	0.071		0.077		0.091	
Log Likelihood	-3984.22		-3958.47		-3898.39	

Note. The symbols ***, **, * denote that the coefficient is statistically different from zero at the 1, 5 and 10 percent.