DO MONETARY REWARDS CROWDING INTRINSIC MOTIVATIONS OF VOLUNTEERS? SOME EMPIRICAL EVIDENCE FOR ITALIAN VOLUNTEERS

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Do monetary rewards crowding intrinsic motivations of volunteers? Some empirical evidence for Italian volunteers

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Abstract

This paper studies if monetary rewards to volunteers affect their intrinsic motivation. Using a sample of Italian volunteers, allowing distinguishing the type of volunteer, the paper shows that monetary rewards influence positively the choice to donate continuative voluntary hours, while intrinsic motivation increases occasional hours per week. Thus, a crowding in effect on intrinsic motivation does not seem to emerge for all volunteers. To test further these results, the paper uses the psychological condition under which the crowding-in effect might appear: monetary rewards crowd-in intrinsic motivation if the individuals affected perceive them as supportive. In that case, self-determination and self-esteem are fostered, and individuals fell that they are more freedom to act, thus increasing their intrinsic motivation in the activity controlled. Using a trivariate Probit model, for the sample of all volunteers, the papers finds that monetary rewards do not affect self-esteem, but self-esteem has positive effect on intrinsic motivation. Moreover, self-determination has no effect on intrinsic motivation such as self-determination is not affected by monetary rewards.. As a result, the paper doesn't find evidence of crowd in (out) effect of monetary rewards on intrinsic motivation for both continuative and occasional volunteer workers.

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1. Introduction

In the literature on social sciences it is possible identifies two different branches that support the idea according to which monetary rewards may crowding out intrinsic motivation. The first stem is related to Titmuss and Upton's books[1], in which the authors argue and support the observation that paying for blood undermines cherished social values. Therefore, the payment reduces or totally eliminates the willingness to donate blood. The second branch comes from psychology. In particular, a group of cognitive social psychologists[2] identifies that, under particular conditions, monetary rewards undermine intrinsic motivation. This effect is termed "*the hidden cost of reward*" (Lepper, Green 1978), or "*corruption effect*" (Deci 1975). The "*crowding-out effect*" (as it is also called) is one of the most important anomalies in economics, as it suggests the opposite of the most fundamental economic "law", that raising monetary incentives reduces, rather that increases, supply. As a result, it is not advisable to use the price mechanism to elicit a higher supply and one would moreover rely on a quite different type of incentive, namely intrinsic motivation. In recent years, a number of social scientists, including economist, admit the theoretical possibility that motivation may be negatively affected when a previously non-monetary relationship is transformed into an explicitly monetary one. Moreover, a large number of studies, based on circumstantial evidence, laboratory and econometric studies, offer an empirical evidence of the existence of crowding-out effect and its correlate, the crowding-in effect (Frey, Jegen 2001)

Based on the works of Frey, Götte (1999) and Frey, Jegen (2001), the present paper analyses if monetary rewards to continuative and occasional Italian volunteers affect their intrinsic motivation using a Survey on Employment in the Social Care and Educational Services conducted by the *Istituto di Studi sullo Sviluppo delle Aziende Nonprofit (ISSAN)* (see Borzaga 2000; Borzaga, Musella 2004). The paper concentrates on voluntary sector because the supply of unpaid labour within social organizations expanded considerably during the end of 1990s in a number of Western countries. In Italy, the fraction of people performing volunteer work within a formal organization increased by 70 percent in the period 1995-2003 (Istat 2003). Understanding if monetary rewards crowding intrinsic motivation of people who offer voluntary work in social organizations in Italy is important for almost two reasons. First, as a consequence of the welfare reforms that have constricted public spending, volunteer work has become a vital production input for non-profit organizations supplying social,

[1] Titmuss (1970) and Upton (1973).
[2] See for a survey Pittman and Heller (1987), Lane (1991).

educational, cultural, recreational and other services. Second, as the social-capital literature suggests, volunteer labour in Italy (the first country in which its effects have been studied analytically) would appear to contribute to regional economic growth by making public institutions and markets more efficient (Putnam 1993; Beugelsdijk, Van Schaik, 2005).

Volunteering is a complex phenomenon the explanation of which transcends the limits of one single approach as different disciplines such as anthropology, psychology, sociology and economics, offer insights into the motives for volunteering. The motivational reasons to explain volunteering behaviour are classified into the following two groups. One group focuses on internal rewards due to intrinsic motivation originating from helping others *per se*. Because people enjoy helping others, no other (material) reward is necessary to motivate people (Hackl et al. 2007). The other group does not refer to the enjoyment of volunteer behaviour by itself but to the increase in utility due to extrinsic rewards from volunteering. Two extrinsic rewards can be distinguished: (i) volunteering can be undertaken as an investment in human capital; (ii) people can volunteer in order to invest in social network (Meier, Stutzer 2008)

A widespread body of empirical literature stresses extrinsic motives for voluntary activities[3]. Menchik, Weisbrod (1987), Day, Devlin (1996) and Hackl et al. (2007), for example, find strong evidence for the investment model in human capital. On the other hand, only few studies investigate the role of both intrinsic and extrinsic motivations in explaining the individual behaviour of volunteers. Recent empirical papers show the importance of intrinsic motivation in explaining volunteering (Cappellari, Turati 2004; Carpenter, Myers 2007; Meier, Stutzer 2008). Moreover, there is not enough evidence of how volunteers would respond if their work were partially paid.

The paper shows the following results. First, monetary rewards enhance continuative volunteer labour supply. Second, intrinsic motivations increase occasional voluntary labour supply. Thus, these findings do not seem to support a crowding in effect for volunteers. To test further these findings I use the psychological condition under which the crowding-in effect might appear: monetary rewards crowd in intrinsic motivation if the individuals affected perceive them as supportive. In that case, self-determination and self-esteem are fostered, and individuals fell that they are more freedom to act, thus increasing their intrinsic motivation in the activity controlled. Using a trivariate Probit model, for the sample of

[3] For a survey see Hackl et al. (2007).

volunteers, I find that monetary rewards do not affect self-esteem, but self-esteem has positive effect on intrinsic motivation. Moreover, self-determination has no effect on intrinsic motivation such as self-determination is not affected by monetary rewards. As a result, I don't find evidence of crowd in (out) effect of monetary rewards on intrinsic motivation for both continuative and occasional volunteer workers.

The paper is structured as follows. Section 2 shortly summarizes existing empirical studies on voluntary labour that consider intrinsic and extrinsic motivations. Section 3 presents the empirical hypothesis to be tested. Section 4 presents the data and sections 5, 6, 7 the econometric estimates. Section 8 concludes.

2. Motivations in existing empirical studies on voluntary labour

Volunteering is a complex phenomenon the explanation of which transcends the limits of one single approach as different disciplines such as anthropology, psychology, sociology and economics offer insights into the motives for volunteering. The motivational reasons to explain volunteering behaviour are classified in two groups. One group focuses on internal rewards due to intrinsic motivation originating from helping others *per se*. According to cognitive social psychology (Deci 1971, 105) "one is said to be intrinsically motivated to perform an activity when one receives no apparent reward except the activity itself". The other group of motives considers the increase in utility due to extrinsic rewards from volunteering: people volunteer instrumentally in order to receive a by-product of volunteer work (Hackl et al., 2007; Meier, Stutzer 2008).

Meier (2006) distinguishes two subcomponents of intrinsic motivation.

(1) *People care about recipient's utility*. Due to pro-social preferences, people's utility increases either if other people are better-off or if inequality between persons diminishes (see Meier, 2007).

(2) *Volunteers enjoy their work per se and intrinsically benefit from the act of volunteering* (Deci 1975; Frey 1997; Andreoni 1990). People enjoy doing the required task by itself and they receive a "warm glow" from contributing time to the provision of a public good. The knowledge of contributing to a good cause is internally self-rewarding. Empirical evidence is found in Menchik, Weisbrod (1987), Vaillancourt (1994), Day, Devlin (1996) and Prouteau, Wolff (2006).

Meier, Stutzer (2008) underline two reasons for which volunteering is extrinsically rewarding.

(1) *Volunteering can be undertaken as an investment in human capital*. Individuals engage in volunteer activities to raise future earnings on the labour market. Empirical evidence is found still in Menchik, Weisbrod (1987), Vaillancourt (1994), Day, Devlin (1996, 1998), and Hackl et al., (2007), Fiorillo (2009).

(2) *People can volunteer in order to invest in social network*. Through engagement in volunteer work, social contacts evolve which can be valuable for getting employment. Employees, for example, may volunteer not only because they enjoy helping others, but also because they wish to signal their good traits and at the same time make valuable social contacts useful for their career. However, volunteers may also enjoy social interactions without the expectations of an extrinsic reward in the future. In this case, meeting people and making friends is intrinsically rather than extrinsically rewarding.

Only few papers try to consider both the intrinsic and extrinsic motivations for volunteering. Frey, Götte (1999) estimate the impact of extrinsic monetary compensation on the supply of voluntary labour in Switzerland. They assume both intrinsically and extrinsically motivated individuals who volunteer in the political sector. In their theoretical model the choice of supplying voluntary work derives from a comparison of benefits and costs. Both are a function of the time spent in volunteering and of the direct reward. Two opposing effects are at work when the direct compensation to voluntary labour increases. On the one hand, direct reward reduces the opportunity costs of volunteering, on the other hand, it undermine the marginal utility of volunteering, so the net effect is theoretically undermined in sign. Empirical findings shows that direct monetary compensation reduce voluntary labour supply (crowding-out effect according to authors). Cappellari, Turati (2004) apply a modify framework of Frey and Götte's model to also consider the hourly wage of volunteers already employed. They assume different types of individuals, from intrinsically to extrinsically motivated individuals who volunteer in social services, political sector and union activism. In the theoretical model the choice of supplying voluntary work derives from a comparison of benefits and costs. The benefits and cost of volunteering stem, respectively, from the intrinsic and extrinsic motivation of the agent. Both are a function of the time spent in volunteering, of the direct reward to volunteer and of the forgone hourly wage rate. The theoretical analysis shows that a change in direct reward and in the exogenous wage rate exerts two contrary effects on the marginal benefits and the marginal costs of volunteering: while an increase in the former lowers both marginal benefits and costs, an increase in the latter raises them together. Therefore, apart individuals purely extrinsically and intrinsically motivated a change

in direct reward and in the exogenous wage rate produce an effect on volunteering which is undermined in sign. Empirical findings displays that extrinsic motivation prevails for those volunteering in the social services and political associations, while intrinsic motivation dominates the decision to volunteer in trade unions.

3. The empirical hypothesis

3.1. Frey, Götte's idea

Social psychologists have argued that there are "hidden costs of reward" (Lepper, Greene 1978), so monetary rewards may reduce intrinsic motivation (Deci, Ryan 1985; Lane 1991) if individuals are sufficiently intrinsically motivated (Grepperud, Pedersen 2006). From a rational point of view, if a person derives intrinsic benefits simply by behaving in an altruistic manner, paying her for this service can reduce her option of indulging in altruistic feelings. Thus, her intrinsic motivation will have a reduced effect on supply (Frey, Oberholzer-Gee 1997).

In the field of labour supply in voluntary sector, Frey, Götte (1999) provide a theoretical model to evaluate how monetary rewards to volunteers affect their intrinsic motivation. This is done in a principal-agent relationship[4]. The volunteer in the role of agent chooses the optimal amount of work effort (input of hours). The manager as the principal of the respective non-profit organization offers direct reward to influence the volunteer labour supply. The choice of supplying labour is derived from a comparison of benefits and costs. The utility $U(V, R)$ and the cost $C(V,R)$ of volunteering depends on hours volunteered V and on direct reward R made to volunteer. Utility function $U(.)$ and cost function $C(.)$ show standard properties: marginal benefit is decreasing ($U_V>0$, $U_{VV}<0$), whereas marginal cost is increasing ($C_V>0$, $C_{VV}>0$), Rational individuals choose that amount of volunteering V that maximizes their net benefit i.e. $U_V - C_V = 0$. A change in direct reward R has the following impact on volunteer work (by the envelope theorem)

$$U_{VR} + U_{VV}\frac{dV^*}{dR} = C_{VR} + C_{VV}\frac{dV^*}{dR} \tag{1}$$

And rearranging

$$\frac{dV^*}{dR} = \frac{U_{VR} - C_{VR}}{C_{VV} - U_{VV}} \tag{2}$$

[4] See also Frey (1992), Frey (1994), Cappellari, Turati (2004).

Given that the denominator is positive, the change in marginal benefits and in marginal costs inducted by the change in R determines the sign of expression (2). When U_{VR} and C_{VR} are both different from zero, the sign of expression (2) is undetermined; when either U_{VR} and C_{VR} are zero there is a clear behavioural response following an increase in R. According to Frey and Götte two polar cases may be distinguished. At one extreme, an increase in the direct reward causes a *relative price effect* because it lowers the opportunity cost of volunteering ($C_{VR} < 0$). If $U_{VR} = 0$ an increase in the direct reward increases the supply of voluntary work: $dV^* / dR > 0$. At the other extreme, an increase in the direct reward causes a *crowding-out effect* because it undermines the marginal utility of volunteering ($U_{VR} < 0$). If $C_{VR} = 0$, an increase in the direct reward reduces the supply of voluntary work: $dV^* / dR < 0$.

Hypothesis 1. In the data set and differently from Frey, Götte (1999) and Cappellari, Turati (2004), there are two types of volunteers: continuative and occasional. Thus, in order to provide hypothesis for empirical analyses:

A) I assume that for continuative volunteers it is important the opportunity cost of volunteering. Thus, for them $U_{VR} = 0$ (intrinsic motivation is zero), $C_{VR} < 0$ and $dV^* / dR > 0$. In other words, there is a relative price effect.

B) For occasional volunteers, it is fundamental the utility of volunteering, therefore for them $C_{VR} = 0$, $U_{VR} < 0$ or $U_{VR} > 0$ and $dV^* / dR < 0$ or $dV^* / dR > 0$ if there is a crowding-out or crowding-in effect.

Empirical implication. In the empirical analysis, the dataset does not present information on the opportunity cost of volunteering, but only on monetary rewards and on intrinsic motivation. Thus, *Hypothesis 1A* implies that if intrinsic motivation is zero ($U_{VR} = 0$), the proxy of monetary rewards is positive and significant. Furthermore, *Hypothesis 1B* involves that if intrinsic motivation is different to zero, the proxy of monetary rewards is significant but undefined in the sign.

3.2. Frey, Jegen's suggestion

To further analysis the crowding effect for volunteers, I follow Frey, Jegen (2001) according to which the psychological conditions under which the crowding-out (in) effect appears are two:

i) Monetary rewards crowd out (in) intrinsic motivation if the individuals affected perceive them to be controlling (supportive). In that case, self-determination suffers (is fostered), and the individuals react by reducing (increasing) their intrinsic motivation in the activity controlled;

ii) Monetary rewards crowd out (in) intrinsic motivation if the individuals affected feels that his or her involvement and competence isn't (is) appreciated by the principal. In that case, self-esteem is weakened (reinforced) and individuals reduce (increase) effort.

Thus, one intrinsic motivation is taken to depend on the application of the monetary rewards, an additional consideration becomes relevant: do monetary rewards support or damage intrinsic motivation through the enlargement of self-determination and self-esteem? This question can be answered on the basis of the following criteria: analysing simultaneously the effect of monetary rewards on intrinsic motivation throughout self-determination and self-esteem.

Hypothesis 2. If the reasoning stated above is right, I assume that monetary rewards affect intrinsic motivation through self-determination and self-esteem. In other words, I would expect that monetary rewards influence simultaneously self-determination and self-esteem, and they have effect on intrinsic motivation.

4. Data set and descriptive statistics

The empirical analysis is based on the survey on Employment in the Social Care and Educational Services conducted by the *Istituto di Studi sullo Sviluppo delle Aziende Nonprofit (ISSAN)* on public, for profit and non-profit organizations operating in the supply of a limited number of personal facilities: assistance and guardianship, nursing/rehabilitation, educational, cultural, recreational, school and school-to-work guidance, job-search assistance and others (see for more details Borzaga 2000). The survey was carried out in the first semester of 1998 in fifteen Italian provinces providing information on 730 voluntary workers. Among the mass of information utilized in the paper, there are data on personal characteristics, time spent in

volunteering, reimbursements, intrinsic motivations, type of organization, volunteer activities, volunteer experience. Appendix gives a table with name and definition of all the variables.

The survey asks individuals how often they offer voluntary work in the organization and how many hours they devote to voluntary activity. Based on these questions, I divide the sample of volunteers into two subsamples: regular volunteers (hours per week) and occasional volunteers (hours per month). These are the dependent variables. Table 1 shows that, on average, approximately, 10 hours per week and 14 hours per month are devoted to voluntary work in social services.

One of the main advantages of *ISSAN* dataset is that it provides detailed information on reimbursements and motivations of volunteers. Therefore, I form a dummy for reimbursements, assuming value 1 if volunteers receive reimbursements for their activity and 0 otherwise. Besides, in the absence of an consolidated literature, I define intrinsic motivation from three questions in which individuals are asked if they are in agreement that voluntary work is i) "a moral duty"; ii) "an opportunity to help others"; iii) "an opportunity to fulfil oneself". I identify an intrinsic motivation dummy, which equals 1, for individuals who are in agreement with all the previous questions. Table 1, displays that 23 percent of continuative volunteers and 19 percent of occasional ones receive monetary compensation. With regard to intrinsic motivation only 18 percent of occasional volunteers show an intrinsic motivation, against 22 percent of continuative ones.

The ISSAN dataset provides information on the type of volunteer activity performed by the voluntary worker within the organization. Using this information, I form four dummy variables, whose description is given in the table of the appendix. These variables are used as control variables. Anyway, following Freeman (1997, S158), the aim is to understand if the activity in which the volunteer offers its services – coordination, management, service supply and backing - is relevant in explaining her behaviour. Table 1 shows no substantial differences between the two samples, except for the activities of service supply and backing. Moreover, table 1 highlights an important similarity in the education dummies and differences in age dummies for the two samples. In particular, for occasional volunteers, the dummies for older ages are those that provide less voluntary work. Interestingly, 96 percent of regular and occasional volunteers will continue the volunteer activity in the future. In addition, regular volunteers, on average, have a volunteer experience about 5 years.

Table 1 – Descriptive statistics

	Continuative volunteer work			Occasional volunteer work		
Variable	**Obs**	**Mean**	**St. Dev.**	**Obs**	**Mean**	**St. Dev.**
Hours per week	511	9.79	11.17			
Hours for month				150	14.24	15.98
Female	536	0.63	0.48	184	0.62	0.49
Married	536	0.39	0.49	180	0.42	0.49
Widowed	536	0.04	0.19	180	0.03	0.18
Age 21-30	539	0.34	0.47	184	0.47	0.50
Age 31-40	539	0.16	0.37	184	0.17	0.37
Age 41-50	539	0.13	0.34	184	0.13	0.34
Age 51-60	539	0.15	0.36	184	0.08	0.27
Age 61+	539	0.16	0.37	184	0.09	0.29
Elementary school	536	0.05	0.23	183	0.06	0.25
Junior High school	536	0.18	0.39	183	0.17	0.38
University	536	0.20	0.49	183	0.16	0.37
Qualification	525	0.14	0.34			
Reimbursements	523	0.23	0.42	176	0.19	0.39
Intrinsic motivation	510	0.22	0.41	173	0.18	0.39
Retired	528	0.21	0.40	181	0.11	0.31
Military/Objector	528	0.03	0.17	181	0.01	0.10
Other professional condition	528	0.04	0.19	181	0.06	0.24
Employed in social services	530	0.07	0.25			
Volunteer experience	538	59.76	64.86			
Coordination	534	0,11	0.32	184	0.08	0.26
Management	534	0.10	0.30	184	0.06	0.25
Service supply	534	0.65	0.48	184	0.55	0.50
Backing	534	0.24	0.43	184	0.15	0.44
Training	519	0.34	0.47			
Public	539	0.24	0.43	184	0.12	0.33
For-profit	539	0.00	0.06	184	0.01	0.07
Non-profit non religious	539	0.25	0.43	184	0.27	0.45
Public/Private	539	0.18	0.39	184	0.26	0.44
Family members volunteers	539	0.37	0.48	184	0.40	0.49
Friends	537	0.13	0.34	180	0.18	0.38
Keep on volunteering	533	0.96	0.20	180	0.96	0.19
Recruitment	531	0.31	0.46	182	0.32	0.47
Self-determination	488	0.60	0.48	169	0.53	0.50
Self-esteem	495	0.72	0.45	172	0.70	0.46

Table 2 – Correlations

Panel A. Continuative volunteer labour

	Continuative volunteer labour				
	Hours per week	Monetary rewards	Intrinsic motivation	Self-determination	Self-esteem
Hours per week	1.00				
Monetary rewards	0.24	1.00			
Intrinsic motivation	-0.01	0.03	1.00		
Self-determination	0.13	0.10	0.06	1.00	
Self-esteem	0.07	0.12	0.21	0.53	1.00

Panel B. Occasional volunteer labour

	Continuative volunteer labour				
	Hours per week	Monetary rewards	Intrinsic motivation	Self-determination	Self-esteem
Hours per week	1.00				
Monetary rewards	0.30	1.00			
Intrinsic motivation	0.25	0.10	1.00		
Self-determination	0.10	0.01	0.11	1.00	
Self-esteem	0.08	0.05	0.25	0.41	1.00

Psychological variables derive from questions concerning satisfaction. In particular, I use two questions regarding decisional/functional autonomy and recognition for the activity carried out. I define Self-determination as a dummy, which equals 1, if volunteer is very satisfied with the decisional and functional autonomy enjoyed in the organization. Moreover, self-esteem is described as a dummy, which equals 1, if the volunteer is very satisfied for the recognition by other individuals for the activity that he carries out. Table 1 shows no substantial differences between the two samples.

Simple correlations among the number of hours offered, intrinsic motivation, monetary rewards, self-determination and self-esteem are showed in table 2. It emerges that all correlations are positive, except that on the intrinsic motivation in continuative voluntary labour (Panel A).

5. The econometric strategy

This section describes the econometric methodologies used to perform the empirical tests of the hypotheses presented in section 3. First, I study how individuals react when considering both reimbursements and the intrinsic motivation.

A simple way to assess *hypothesis 1* is by means of OLS equations with which volunteering hours are regressed against the set of controls plus the reimbursements and the intrinsic motivation variables

$$V_i = \boldsymbol{\beta' X_i} + \gamma R_i + \delta I_i + \varepsilon_i \qquad (3)$$

where V_i are hours of volunteer labour, $\mathbf{X_i}$ is the vector of explanatory variables, R_i is the vector of the reimbursements, I_i is the vector of the intrinsic motivation dummy and ε_i captures the unobservables. The set of controls included in $\mathbf{X_i}$ corresponds to the variables listed in table 1 and three macro-regional dummies.

Second, to perform an empirical test of *hypothesis 2*, I estimate the equations for intrinsic motivation, self-determination and self-esteem using a trivariate Probit model that consider the correlation between the errors of the following three Probit equations

$$I^*_{i,1} = \boldsymbol{\beta' X_{i,1}} + \lambda SD_{i,1} + \theta SE_{i,1} + \varepsilon_{i,1}, \quad I^*_{i,1} = 1 \text{ if } I^*_{i,1} > 0 \qquad (4)$$

$$SD^*_{i,2} = \boldsymbol{\beta' X_{i,2}} + \pi_1 R_{i,2} + \varepsilon_{i,2}, \qquad SD^*_{i,2} = 1 \text{ if } SD^*_{i,2} > 0 \qquad (5)$$

$$SE^*_{i,3} = \boldsymbol{\beta' X_{i,3}} + \pi_1 R_{i,3} + \varepsilon_{i,3}, \qquad SE^*_{i,3} = 1 \text{ if } SE^*_{i,3} > 0 \qquad (6)$$

where I_i is the dummy for intrinsic motivation, X_i the vector of independent variables described in appendix plus three macro-regional dummies, associated with the vector of the β coefficients; SD_i, SE_i and R_i are the dummies of self-determination, self-esteem and reimbursements, while ε_i are the errors.

I jointly estimate the equations (4), (5) and (6) using a trivariate Probit model that considers the correlation between the errors of the three Probit equations, with error terms distributed as a trivariate normal distribution, each with mean of zero and a variance-covariance matrix with values equal to 1 on the main diagonal and a correlation of $\rho_{jk} = \rho_{kj}$.

6. Empirical results

The results of the estimate of (3) for continuative volunteer labour are given in Table 4, which also shows the standard errors (in brackets) corrected for heteroskedasticity and the provincial clustering of residuals. According to the discussion in the Section 3, *hypotheses 1* is tested by looking the sign of the coefficients on reimbursements and on the intrinsic motivation. The first is expected to increase regular volunteer labour, together are expected to raise occasional unpaid work.

First, I find a positive correlation between regular time and reimbursements and no correlation between hours per week and the intrinsic motivation (column 3). These findings corroborate *hypotheses 1A* in the Section 2. In particular, a one-standard-deviation change in reimbursements is associated with a change in continuative volunteer labour of 19 percentage-points. Second, the number of hours of regular volunteer labour increase and then decrease with education. People with no more than compulsory schooling (junior high school) do significantly less volunteer work than high school (reference group) and university graduates do significantly less, too. However, a specific qualification to perform social services (qualification dummy) increases continuative volunteer work. Third, non work status is an important determinant of unpaid regular labour. Being retired and military/objector increase continuative work for volunteer organization, as those who are in other professional condition. It is interesting to highlight that a one-standard-deviation increase in military/objector variable is associated with an increase in regular unpaid labour of 27 percentage-points (column 3). .

According to Freeman (1997), the standard theory of labour supply cannot explain the differences among volunteers with similar individual characteristics, based on the opportunity cost of volunteering. He pointed out that the specific activity the individual is engaged in could supply more exhaustive explanations. The specific activity one carries out could be relevant in granting opportunities to skilled workers and, at same time, for the non profit organisation, as it represents an instrument to attract skilled resources (Ranci, 2006). For this reason I introduce activities carried out in social organisations in column 3. The variable coordination is positive and significant at 10 percent; while the variable that refers to the direct contact of regular volunteer with the people they assisted (service supply) is negative and significant at 5 percent. A one-standard-deviation increase in service supply variable is associated with a decrease in regular unpaid labour of 14 percentage-points (column 3).

Table 4 – OLS estimates for continuative volunteer labour

	Hours per week					
Variable	**I**		**II**		**III**	
Female	-0.0266	(0.0646)	-0.0323	(0.0620)	-0.0194	(0.0612)
Married	-0.1874	(0.1266)	-0.1678	(0.1315)	-0.1726	(0.1296)
Widowed	0.2172	(0.2917)	0.2065	(0.3193)	0.1032	(0.2744)
Age 21-30	-0.0233	(0.1324)	-0.0206	(0.1434)	-0.0202	(0.1227)
Age 31-40	-0.0907	(0.1127)	-0.0659	(0.1099)	-0.1197	(0.1074)
Age 41-50	0.2718	(0.1562)	0.2761	(0.1636)	0.3017	(0.1738)
Age 51-60	0.3165	(0.1947)	0.2574	(0.1877)	0.2503	(0.1760)
Age 61+	0.1352	(0.2025)	0.1682	(0.2202)	0.1562	(0.2104)
Elementary school	0.2523	(0.1678)	0.2558	(0.1698)	0.1752	(0.1506)
Junior High school	-0.2148*	(0.0994)	-0.1897*	(0.0968)	-0.2084**	(0.0806)
University	-0.3468***	(0.0741)	-0.3526***	(0.0805)	-0.3747***	(0.0857)
Qualification	0.2003*	(0.1047)	0.2028**	(0.0800)	0.1588**	(0.0700)
Reimbursements	0.4684**	(0.1712)	0.4957**	(0.1851)	0.4451**	(0.1750)
Intrinsic motivation			-0.0515	(0.1078)	-0.0589	(0.0898)
Retired	0.2504***	(0.0766)	0.2616**	(0.0868)	0.2798***	(0.0723)
Military/Objector	1.6086***	0.2304)	1.5809***	(0.2236)	1.6073***	(0.1798)
Other professional condition	0.7835**	(0.2795)	0.8358**	(0.2995)	0.8143***	(0.2936)
Employed in social services	0.0800	(0.0750)	0.0807	(0.0779)	0.0408	(0.1115)
Volunteer experience	0.0016***	(0.0004)	0.015***	(0.0003)	0.0011***	(0.0003)
Coordination					0.2861*	(0.1408)
Management					0.2117	(0.2510)
Service supply					-0.3002**	(0.1150)
Backing					0.0118	(0.0869)
Training	0.1393	(0.0881)	0.1335	(0.0899)	0.1356	(0.0773)
Public	-0.0939	(0.1450)	-0.1028	(0.1515)	-0.0796	(0.1374)
For-profit	0.3993*	(0.2232)	0.4006*	(0.2173)	0.6347***	(0.2087)
Non-profit non-religious	-0.0587	(0.1326)	-0.0674	(0.1345)	-0.0318	(0.1212)
Public/Private	0.0962	(0.1582)	0.1063	(0.1545)	0.1174	(0.1509)
Family members volunteers	-0.0978	(0.1057)	-0.1154	(0.1132)	-0.1208	(0.1120)
Friends	0.0348	(0.1258)	0.0236	(0.1262)	0.0802	(0.1239)
Keep on volunteering	-0.7214**	(0.2833)	-0.7704**	(0.3099)	-0.7919**	(0.2915)
Recruitment	0.0899	(0.1587)	0.0930	(0.1493)	0.1462	(0.1461)
Macro-Regions	Yes		Yes		Yes	
No. obs.	451		436		435	
R^2	0.39		0.40		0.43	

Notes: Dependent variables in natural logarithms. The independent variables are described in the appendix. Standard errors (in brackets) are corrected for heteroskedasticity and clustering of residuals at provincial level. The symbols ***, **, * denote significance at the 1, 5 and 10 percent levels respectively.

Moreover, people who offer more unpaid regular labour are engaged in for-profit organizations and do not intend to keep on volunteer work in the future. Finally, the estimates (not shown) about macro-regional dummies indicate that people who live in the provinces of northern-west Italy and in the provinces of the south do significantly more continuative volunteer work.

Moving to results to occasional volunteer work (hours per month), let me first consider the reimbursement dummy. It can be observed in table 5 that the coefficient on reimbursements is positive and significant at 10 percent level in column 2. The coefficient on intrinsic motivation is positive and significant at 5 percent, too. However, when I introduce activities carried out in social organisations in column 3, the estimate on reimbursements dummy is not significant, while the estimate on the intrinsic motivation variable is still significant at 5 percent. These findings do not corroborate *hypotheses 1B* in the Section 3. In particular, it seems evident that the marginal utility of volunteering is offset by the opportunity cost of volunteering, from which the non-significance of the coefficient on reimbursements.

Returning to the intrinsic motivation, a one-standard-deviation change in this variable is associated with a change in occasional volunteer labour of 19 percentage-points. Moreover, following Freeman (1997), the specific activity the individual is engaged in supply more explanations. It appears that for the occasional volunteer is largely important the specific activities conducted in social organizations. The variables of activity show a positive and significant coefficient on coordination and management variables, a negative one on service supply variable, while the dummy backing is not significant. As for regular continuative labour, the direct contact with the people they assisted (service supply) decreases the occasional volunteer work. On the other hand, a one-standard-deviation change in the management dummy is associated with a change in occasional volunteer labour of 26 percentage-points.

Second, the coefficients of the age dummy indicate a negative relationship between age and unpaid occasional labour. The hours per month declines with age (reference group 16-20). The evidence that occasional volunteer work decreases with age would appear to support the literature's investment motives (see Menchik, Weisbrod 1987). Furthermore, this conclusion results also supported by the variable recruitment, which is positive and highly significant. It is interesting to emphasize that a one-standard-deviation increase in recruitment variable is associated with an increase in non regular unpaid labour of 23 percentage-points (column 3). As for regular volunteer labour, non work status is an important determinant of

Table 5 – OLS estimates of occasional volunteer labour

	Hours per month					
Variable	**I**		**II**		**III**	
Female	-0.2794	(0.2415)	-0.2031	(0.2392)	-0.1802	(0.1940)
Married	0.0140	(0.1607)	0.1646	(0.1716)	0.2136	(0.1525)
Widowed	-0.8025*	(0.4243)	-0.6515*	(0.2901)	-0.6193*	(0.2911)
Age 21-30	-0.5788**	(0.1906)	-0.5501**	(0.1931)	-0.6631**	(0.2133)
Age 31-40	-0.7363**	(0.2621)	-0.7562**	(0.2623)	-0.9544***	(0.2332)
Age 41-50	-0.5917	(0.4136)	-0.8516**	(0.3478)	-1.1141***	(0.2874)
Age 51-60	-1.2201*	(0.5466)	-1.3182**	(0.4674)	-1.6111***	(0.4639)
Age 61+	-1.2801*	(0.6707)	-1.4864**	(0.5543)	-1.2875**	(0.5129)
Elementary school	-0.3531	(0.2498)	-0.4505*	(0.2333)	-0.3560	(0.2493)
Junior High school	0.1470	(0.2754)	0.1596	(0.2495)	0.1239	(0.2424)
University	-0.3033	(0.2121)	-0.2458	(0.1673)	-0.1601	(0.1602)
Reimbursements	0.5178*	(0.2808)	0.4946*	(0.2498)	0.3442	(0.2362)
Intrinsic motivation			0.4786**	(0.1976)	0.4912**	(0.1745)
Retired	1.0746*	(0.5313)	1.1820**	(0.4546)	0.9504*	(0.4267)
Military/Objector	1.4228***	(0.2924)	1.4532***	(0.2799)	1.2392**	(0.4363)
Other professional condition	1.3330***	(0.2851)	1.2263***	(0.2361)	0.9892***	(0.1870)
Coordination					0.5665**	(0.2103)
Management					1.0343***	(0.2986)
Service supply					-0.2336**	(0.2986)
Backing					-0.2488	(0.2693)
Public	0.7684**	(0.2484)	0.7629***	(0.2360)	0.7065**	(0.2926)
For-profit	-0.0962	(0.2640)	-0.0680	(0.2775)	-0.3225	(0.3398)
Non-profit non-religious	-0.0854	(0.2826)	-0.0855	(0.2658)	-0.1669	(0.2561)
Public/Private	0.0645	(0.2235)	0.0097	(0.2096)	0.0266	(0.2780)
Family members volunteers	-0.2662***	(0.0784)	-0.1922**	(0.0855)	-0.2863**	(0.1039)
Friends	-0.1029	(0.0964)	-0.1160	(0.0966)	-0.0584	(0.1056)
Keep on volunteering	-0.6027	(0.9367)	-0.6670	(0.9028)	-0.2313	(0.6012)
Recruitment	0.5003**	(0.1600)	0.4430**	(0.1030)	0.4855***	(0.1274)
Macro-Regions	Yes		Yes		Yes	
No. obs.	134		132		132	
R^2	0.50		0.53		0.60	

Notes: Dependent variables in natural logarithms. The independent variables are described in the appendix. Standard errors (in brackets) are corrected for heteroskedasticity and clustering of residuals at provincial level. The symbols ***, **, * denote significance at the 1, 5 and 10 percent levels respectively.

unpaid work: being retired and military/objector increase occasional work for social organizations. Finally, people who offer more unpaid non regular labour are engaged in public organizations and do not have family members who are volunteers.

Summarizing, the empirical evidence of tables 4 and 5 show that for continuative volunteers it is important the opportunity cost of volunteering (*relative price effect*), while for occasional volunteers, it is fundamental the intrinsic motivation of volunteering. In the next section to test the robustness of previous finding I use the psychological condition under which the crowding-in effect might appear.

7. Sensitivity analysis

According to Frey (1992) and Frey, Jegen (2001), monetary rewards crowd in intrinsic motivation if the individuals affected perceive them to be supportive. In that case, self-determination is fostered, and the individuals react by increasing their intrinsic motivation in the activity controlled. Moreover, monetary rewards crowd in intrinsic motivation if the individuals affected feels that his or her involvement and competence is appreciated by the principal. In that case, self-esteem is reinforced and individuals increase effort.

The two criteria may well be relevant simultaneously. Indeed, in table 2 panel A emerges some positive correlations among intrinsic motivation, monetary rewards, self-determination and self-esteem variables (both in continuative voluntary labour and in occasional unpaid work).

This section reports the results of the estimate of the trivariate Probit model for all volunteers. They are shown in table 6, which also presents the standard errors (in brackets) corrected for heteroskedasticity and the provincial clustering of residuals. According to the discussion in the Section 3, *hypotheses 2* is tested by looking the sign of coefficient on reimbursements in self-determination and self-esteem equations, and analysing the sign of coefficients on self-determination and self-esteem in intrinsic motivation equation. All the coefficients are expected positive and significant.

First, "Likelihood Ratio (LR) test of PMV", the test of correlation among the error terms of the three Probit equations, indicates that the null hypothesis of no correlation among the error terms can be rejected to the ordinary level of confidence.

Table 6 – Trivariate Probit estimates for the sample of volunteers

	Eq. 1		*Eq. 2*		*Eq. 3*	
Variable	*Intrinsic motivation*		*Self-determination*		*Self-esteem*	
Female	0.0093	(0.1440)	-0.3025***	(0.0793)	0.0073	(0.1782)
Married	0.0540	(0.1862)	-0.0189	(0.2258)	0.1156	(0.1542)
Widowed	0.3600	(0.5208)	-0.4912	(0.4848)	-0.4462	(0.3545)
Age 21-30	-0.1386	(0.1656)	0.1698	(0.2348)	0.2190	(0.2664)
Age 31-40	-0.2840	(0.3378)	0.3357	(0.2534)	0.5911	(0.3638)
Age 41-50	0.1337	(0.3149)	0.0999	(0.3245)	0.1952	(0.4481)
Age 51-60	-0.0607	(0.3379)	-0.0901	(0.4810)	0.0612	(0.4077)
Age 61+	-0.0245	(0.3627)	0.9476**	(0.4560)	0.3131	(0.4469)
Elementary school	0.0428	(0.2578)	-0.1073	(0.2731)	0.1933	(0.3115)
Junior High school	-0.0675	(0.1540)	0.1785	(0.1285)	0.1310	(0.1266)
University	-0.1867	(0.1231)	0.1507	(0.1028)	0.1282	(0.1196)
Qualification	-0.3114*	(0.1707)	-0.0155	(0.1756)	-0.0629	(0.1889)
Self-determination	0.6360	(0.4400)				
Self-esteem	1.3019**	(0.6503)				
Reimbursements			0.3336	(0.2599)	0.2931	(0.1865)
Retired	0.3295	(0.3552)	-0.3240	(0.2247)	0.2541	(0.3258)
Military/Objector	0.3187	(0.4963)	-0.5659**	(0.2538)	-0.4244	(0.2936)
Other professional condition	0.0574	(0.2539)	0.2686	(0.3163)	0.1324	(0.4150)
Employed in social services	0.0621	(0.1205)	0.3115*	(0.1685)	0.1142	(0.2361)
Volunteer experience	0.0018*	(0.0010)	-0.0009	(0.0008)	0.0001	(0.0006)
Coordination	0.0031	(0.2660)	0.5683**	(0.2251)	0.0987	(0.3157)
Management	-0.2171	(0.3262)	4.4760***	(0.2565)	0.3484	(0.4867)
Service supply	0.0778	(0.1440)	0.2609	(0.1610)	0.8000	(0.1710)
Backing	0.2131	(0.1607)	-0.0213	(0.1844)	-0.3229	(0.1879)
Training	-0.0976	(0.1461)	0.2263*	(0.1343)	0.1882	(0.1725)
Public	0.2294	(0.1878)	0.0731	(0.2093)	-0.3831	(0.2405)
For-profit	-4.6363***	(0.4603)	5.0057***	(0.2040)	4.2576***	(0.8720)
Non-profit non-religious	0.3858***	(0.1377)	-0.0052	(0.1223)	-0.2517	(0.2687)
Public/Private	0.4425***	(0.1587)	0.1177	(0.1562)	-0.2511	(0.2549)
Family members volunteers	0.0432	(0.1332)	-0.1583	(0.1042)	-0.3398***	(0.0754)
Friends	0.0771	(0.1262)	0.0100	(0.1366)	-0.1683	(0.1960)
Keep on volunteering	-0.0691	(0.3169)	0.5972**	(0.2674)	0.2666	(0.2311)
Recruitment	0.1713	(0.1247)	-0.2304*	(0.1292)	-0.0409	(0.1382)
Macro-Regions	Yes		Yes		Yes	
No. obs.	572					
Log likelihood	-866.31356					
LLR test of PMV (χ^2)	98.4194 (0.0000)					

Note. The 3-equation model is estimated simultaneously using *Simulated Maximum Likelihood* (SML) methods. The estimates are marginal Probit effects. Standard errors (in brackets) are corrected for heteroskedasticity and the clustering of residuals at provincial level. The symbols ***, **, * denote significance at the 1, 5 and 10 percent levels respectively. Ho is $Cov(\varepsilon_{i,2}, \varepsilon_{i,1})= Cov(\varepsilon_{i,3}, \varepsilon_{i,1})=Cov(\varepsilon_{i,3}, \varepsilon_{i,2})=0$

Second, in Eq. 1 the coefficient on the variable intended to capture self-esteem in the provision of voluntary work is significant and with the expected sign: in particular self-esteem is positively associated with intrinsic motivation. Thus, self-esteem seems to matter in the provision of time donation: a person, who feels that her involvement and competence is appreciated by others (included the principal) increases her intrinsic motivation. On the other hand, the coefficient on the variable intended to measure self-determination is not significant. Therefore, self-determination does not seem to be important in increasing intrinsic motivation.

However, in Eq. 3 the coefficients on the variables that proxies monetary rewards in the determination of self-determination and self-esteem are not significant. This last finding is not in line with Frey, Jegen's suggestion: monetary rewards do not crowd in intrinsic motivation. In other words, monetary rewards do not seem to be a key determinant of self-esteem, and consequently they do not affect intrinsic motivation throughout self-esteem.

As a result, the overall findings of this section do not support *hypotheses 2.*

8. Concluding remarks

This paper have analysed the role of monetary rewards and intrinsic motivations in the decision to supply voluntary hours, using Frey, Götte's idea and Frey, Jegen's suggestion as empirical hypotheses. Several studies have pointed out that intrinsic motivations may be important for volunteering (Freeman 1997; Cappellari and Turati 2004; Carpenter, Myers 2007; Meier, Stutzer 2008).

This paper has used a dataset on a sample of Italian volunteers to evaluate if and how monetary rewards to volunteers affect their intrinsic motivations. It has found that monetary rewards enhance continuative volunteer labour supply, while intrinsic motivations increase occasional voluntary labour supply. Thus, these findings do not support a crowding in effect for volunteers.

To test further this result I have used the psychological condition under which the crowding-in effect might appear: monetary rewards crowd in intrinsic motivation if the individuals affected perceive them as supportive. In that case, self-determination and self-esteem are fostered, and individuals fell that they are more freedom to act, thus increasing their intrinsic motivation in the activity controlled. For the sample of volunteers, using a trivariate Probit model – that simultaneously accounts for intrinsic motivation, self-determination and self-esteem –, the paper has found that monetary rewards do not affect self-esteem, but self-esteem has positive effect on intrinsic motivation. Moreover, self-determination has no effect on intrinsic motivation such as self-determination is not affected by monetary rewards. As a result, the paper did not find evidence of crowd in effect of monetary rewards on intrinsic motivation for both continuative and occasional volunteer workers.

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Appendix

Variable	Description
Dependent variables	
Hours per week	Number of hours of volunteer labour per week
Hours per month	Number of hours of volunteer labour per month
Personal characteristics	
Female	Dummy, 1 if female; 0 otherwise
Married	Dummy, 1 if married; 0 otherwise
Widowed	Dummy, 1 if widowed; 0 otherwise
Age 16-20	Dummy, 1 if age is between 16 and 20; 0 otherwise. **Reference group**
Age 21-30	Dummy, 1 if age is between 21 and 30; 0 otherwise
Age 31-40	Dummy, 1 if age is between 31 and 40; 0 otherwise.
Age 41-50	Dummy, 1 if age is between 41 and 50; 0 otherwise
Age 51-60	Dummy, 1 if age is between 51 and 60; 0 otherwise
Age 61+	Dummy, 1 if age is equal to 61 and above; 0 otherwise
Elementary school	Dummy, 1 if elementary school or no education; 0 otherwise
Junior High school	Dummy, 1 if compulsory education; 0 otherwise
High school	Dummy, 1 if high school graduates; 0 otherwise. **Reference group**
University	Dummy, 1 if university degree and doctorate; 0 otherwise
Qualification	Dummy, 1 if specific qualification to perform welfare and educational services
Employed	Dummy, 1 if the volunteer is employed; 0 otherwise. **Reference group**
Retired	Dummy, 1 if the volunteer is retired; 0 otherwise
Military/Objector	Dummy, 1 if the volunteer is in military service and/or a conscientious objector; 0 otherwise
Other professional condition	Dummy, 1 if the volunteer is in an other professional condition; 0 otherwise
Employed in social services	Dummy, 1 if the volunteer is employed in welfare and educational services; 0 otherwise
Volunteer experience	Number of months of volunteer experience
Reimbursements	Dummy, 1 if the volunteer receives reimbursements for voluntary labour; 0 otherwise
Intrinsic motivation	Dummy, 1 if the volunteer is in agreement that voluntary work is i) "a moral duty"; ii) "an opportunity to help others"; iii) "an opportunity to fulfil oneself"
Volunteer activities	
Coordination	Dummy, 1 if the volunteer performs voluntary work in the activity of coordination/responsibility, 0 otherwise
Management	Dummy, 1 if the volunteer performs voluntary work in the activity of management, 0 otherwise
Service supply	Dummy, 1 if the volunteer performs voluntary work in the activity of service supply, 0 otherwise
Backing	Dummy, 1 if the volunteer performs voluntary work in the activity of support, 0 otherwise
Other activities	**Reference group**
Types of organization	
Public	Dummy, 1 if the type of organization is public; 0 otherwise
For-profit	Dummy, 1 if the type of organization is private for-profit; 0 otherwise
Non-profit religious	Dummy, 1 if the type of organization is private non-profit religious; 0 otherwise.. **Reference group**
Non-profit non-religious	Dummy, 1 if the type of organization is private non-profit non religious; 0 otherwise
Public/Private	Dummy, 1 if the type of organization is mixed (public / private); 0 otherwise

(continued)

(continued)

Variable	Description
Other independent variables	
Training	Dummy, 1 if the volunteer has participated in educational experiences supported by the voluntary organization
Family members volunteers	Dummy, 1 if there are family members who are volunteers; 0 otherwise
Friends	Dummy, 1 if friends have asked to individual to become volunteer; 0 otherwise
Keep on volunteering	Dummy, 1 if the volunteer intends to keep on volunteer work in future; 0 otherwise
Recruitment	Dummy, 1 if the volunteer is interested in being hired by the organization; 0 otherwise
Psychological variables	
Self-determination	Dummy, 1 if the volunteer is very satisfied with the decisional and functional autonomy enjoyed in the organization
Self-esteem	Dummy, 1 if the volunteer is very satisfied for the recognition by other individuals for the activity that he carries out