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VOLUNTEER LABOR SUPPLY IN THE NETHERLANDS

BY

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1 INTRODUCTION

In our society a process of social specialization towards paid work has taken place in a very fundamental way. The consequence of this process is the dominant position of paid work and this is decisive for the functioning of the society as a whole and for the functioning of individuals. Education is strongly fixed on acquiring a paid job to obtain economic independence and social contacts. This perhaps has lead to a neglect of the social importance of volunteer labor.

Because of *e.g.* the cut in government services interest in volunteer work has increased remarkably partly due also to the fact that the valuation of volunteer work has grown. Doing volunteer work can possibly act as a substitute for a paid job and can give some compensation. Furthermore, unemployed people can gain some work experience that may improve their position on the labor market. For a long time the interest of economists for volunteer labor has been minimal.

One of the first problems one meets is how to define the concept of volunteer labor. A widely used definition is the one redacted by the ICV (Interdepartmental Commission on Volunteer work of the Dutch government): volunteer labor is unpaid labor that is done in an unobliged way in favor of other people (outside the own household) or society in any formally organized setting (see CRM, 1980).[1] According to this definition, volunteer labor equals about 7% of the number of full-time equivalent (FTE) employment of paid jobs in the Dutch economy. This percentage corresponds remarkably well with the figure in the US of 8% (Weisbrod, 1980).

In this paper our main interest lies in the investigation of the determinants of

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1 This is a rather narrow definition, because volunteer work in an unorganized setting (assistance to aged or handicapped neighbors or relatives, *etc.*) is not taken into account. When a broader definition is used the total amount of volunteer work can be more than twice as much. For more detail about the various definitions, see Van Dijk (1987).

the decision to participate in volunteer work and in the determinants of the time people spend on volunteer work. In paragraph two we develop a theoretical framework and give an overview of the relevant individual and household characteristics that we expect to determine the decision to participate and the time spent on volunteer labor. Paragraph three deals with the methods of estimation and the data. The empirical results are discussed in paragraph four. Finally, some conclusions are formulated.

2 THEORETICAL MODEL

An important characteristic of volunteer labor is that it holds an explicit (wage) of zero. Although many individuals find aspects of their paid job and the social environment in which they work enjoyable, this is much more likely with volunteer work. Therefore, the analogy with traditional labor supply models is limited. As there is no generally excepted theory with regard to the determinants of volunteer work providing an appropriate set of explanatory variables for an empirical analysis, the present paper is rather explorative.

As to the reasons for taking part in volunteer work Menchik and Weisbrod (1987) distinguish two important motives:

a. the investment motive
b. the consumption motive

The *investment motive* is adopted from the 'human capital' theory in which the development of the individual capacities plays an essential role (Becker, 1975). Taking part in volunteer work can be seen as an investment in human capital, because it enhances the agent's 'basket of productive qualities' embodied in *e.g.* work experience (on-the-job training) and potentially valuable contacts. Costs are the foregone earnings as a result of the reduction of the paid labor time or of the reduction of the leisure time. Profits are the extra earning power or the more immaterial matters such as higher status, regards, influence, *etc.* Another reason to take part in volunteer work is that the volunteer (or other members of his or her household) can make us of the output produced by the volunteer organization (for example a self-help group or a parent who does volunteer labor for the neighborhood playground). Joint use of the output can be seen as an extension of the investment model.

The investment motive supposes a negative intrinsic value of (volunteer) work and gives a positive value to wage and leisure time. However, volunteer labor has, just like paid labor, a twofold nature; *labor can also give satisfaction*. This means that the time one spends on volunteer labor is valued positively and in that case volunteer labor can be seen as a consumption good. The *consumption motive* assumes that providing time, like giving money to donee organizations, is a normal utility-bearing good in itself. The amount supplied varies directly with the individual's wealth.

It is also appropriate to look at the supply of volunteer labor in the framework of the *household* economic unit. Within the household there are a number of tasks which have to be done and take a certain amount of time. For example, time that has to be spend on paid or/and household work, on bringing up children if any, *etc.* The time an individual will spend volunteer labor can be seen as a choice, depending, on the one hand, on the time other members of the family have at their disposal to do part of the household tasks and, on the other hand, on the time an individual has to spend to help other family members. In other words: individuals face a certain *time constraint*, depending on the composition of the family. It is imaginable that a man whose spouse does the household work, is able to spend more time on volunteer work than in the case when both have a paid job. If there are children another situation appears: there will be less time for volunteer work (but maybe the parents do more volunteer work because of the investment motive).

2.1 *Determinants of the Supply of Volunteer Labor*

The before mentioned investment and consumption motives together with time constraints provide a global framework for the explanation of taking part in volunteer work. It is, however, not possible to derive an appropriate set of personal and household characteristics for the empirical analysis in a straightforward way. Certain characteristics can be seen as an operationalization of both investment and consumption motives and/or as an indicator of the time constraint. Because some variables can be related to both motives with opposing expected effects it will be difficult to interpret the empirical results directly in relation with the motives or the time constraint.

The on theoretical and intuitive grounds relevant variables will be discussed in detail below. All variables are expected to affect both the decision (yes or no) to take part in volunteer work and the choice of the number of hours in the same (positive or negative) direction. We will discuss the, in our view relevant, personal and household characteristics and the expected effect on volunteer work without distinguishing between the logit and the tobit model. In other words: a positive expected effect on taking part in volunteer work means both a positive expected effect on the number of people who take part in volunteer work and a positive expected effect on the number of hours spent on volunteer work.

Sex

Differences in participation in volunteer labor between males and females can be a consequence of the still existing social division between male and female. The very low participation rate in the paid labor force of women in The Netherlands may positively affect the amount of time volunteered, because they have a certain kind of freedom in how to spend their time. The sex variable is also an indicator of the hypothesis that women are more inclined to help people because of the

'Florence Nightingale effect.' Menchik and Weisbrod do find evidence for that hypothesis (Menchik and Weisbrod, 1987). Univariate cross tables based on other Dutch surveys show that the volunteer activity of women is less than that of men (see Van Dijk, 1987). Furthermore, women are involved in other types of volunteer work than men. It is also possible that the low paid participation of women keeps them from obtaining the more profitable volunteer jobs, which are often an extension of paid jobs (see Kwant, 1987, De Jong, 1980). It is likely that the differences according to the sex variable are connected with other variables, especially the variable that marks the position on the labor market. Therefore, several interactions of sex with other variables will be tried out.

Position on the labor market

We operationalize the position on the labor market with a variable that gives information about the hours spent on paid labor (full-time, part-time or zero) and about the eventual job search of the unemployed. We expect that the time constraint for people with a full-time job affects volunteer activity in a negative sense but this may differ with sex. Therefore, the interaction between sex and position on the labor market will be taken into account. Married women with a full-time job still have to do most of the household work, and with this double task it is plausible that this limits their possibilities to take part in volunteer work. The position of a jobless married man may differ from that of the jobless married woman: the woman will nearly always be a housewife and has less 'free' time to spend than the jobless man. He will probably do more household work than he would if he was working, but not to such as extent comparable to that of a housewife (see Van Luijk and De Bruin, 1984). For the part-timers we expect the volunteer activity to be in between that of the full-timers and the people without jobs.

From a consumption point of view, jobless people are more inclined to do volunteer labor because the costs of doing volunteer labor are low for the unemployed: they have plenty of time and no foregone earnings and thus the opportunity costs are very low.[2] If we look at the investment motive we expect a positive incentive to do volunteer work for job-searchers: an unemployed individual can obtain on-the-job experience or valuable contacts and they can gain status which other people get from a paid job. The status matter is somewhat tricky. We noted earlier that the 'best' volunteer jobs – from which the highest status can be obtained – are more accessible to working people, especially to men, because of their contacts. For someone in a high position it is even strange if he/she is not asked for a volunteer duty! So, it is ambiguous whether working people benefit more from the status of volunteer work than jobless people: potentially,

2 Unemployed people who are entitled to unemployment benefits are, according to the Dutch social security system, not allowed to do all sorts of volunteer work. Sometimes they need permission from a regional or community council.

jobless people would benefit most, but they do not have enough access to these kind of volunteer jobs.

Age

We expect that the investment motive is more important for younger people than for elder people in view of the shorter payback period of the investment in volunteer work. In relation to the consumption motive, the situation is less clear. It is, however, plausible that the development of altruism – an important aspect in this case – has to do with social consciousness and this may differ with age.

There are more reasons to expect that volunteer work follows a life-cycle pattern: increasing with age until a certain age, and then going down again (a beehive-shape). Young people spend comparatively more time on leisure activities like going out, hobbies or sports. Middle-aged people spend more time on shaping the conditions for such activities and according to the definition this is volunteer labor. Old people are less inclined to engage in volunteer work because of physical constraints (they become the ones that make use of volunteer labor) or diminishing altruism ('I've done enough for society, now I leave it to other, younger people.'). Because of the expected non-linear relation, age is operationalized as a categorical variable.

Education

People with a higher level of education are expected to do relatively more volunteer work (see Van Dijk, 1987, and Menchik and Weisbrod, 1987). A possible explanation again has to do with status, and this also depends on the kind of volunteer work. A certain level of education (together with a paid job) is required or useful for the proper fulfillment of volunteer jobs with high status (for example, chairing the bridge club). Less education is required for assistance to the aged or disabled (this kind of volunteer labor is the domain of housewives and people with a lower education). Volunteers active in sports and recreation have an intermediate position (De Jong, 1980).

Van Luijk and De Bruin (1984) state that volunteer labor is to a high degree an expression of active leisure behavior (instead of watching television). The most important predictor of this active behavior is the level of education (Wippler, 1968).

Income

Income is an important explanatory variable in the investment and consumption model developed by Menchik and Weisbrod (1987). Income is a proxy for the purchasing power of an individual and thus for the amount of volunteer labor he or she is willing to consume. In the combined model of Menchik and Weisbrod the after-tax wage rate is the 'own price' of volunteer labor. Thus income varies directly and wage rate inversely with the amount of volunteer time.

On theoretical grounds we have serious doubts about the relation between

income and the time spent on volunteer work. In many cases someone who works is hardly free to choose the number of hours he wants to spend on a paid job, because that time is, for most people, fixed by institutional regulations. There might be some choise (for instance, between working five or four days a week), but the marginal approach seems hardly applicable with regard to the choice between income and labor time. With regard to the substitution of and complementarity to the contribution of time and/or money as mentioned by Menchik and Weisbrod, the relation between income and time spent on volunteer work is also less clear in The Netherlands. Gifts are only tax-deductable above a fairly high threshold. Due to the very heterogeneous nature of volunteer work in The Netherlands the effects of income on volunteer work may be contradictory for different types of volunteer work. A final problem with the income variable is the high correlation between income and other variables like education, labor market situation and age. Therefore, the *a priori* expectation with regard to the income variable is not clear.

Family situation

The family situation may influence participation in volunteer work in several ways. In the operationalization we distinguish family composition and family culture. Family composition is operationalized by variables representing the marital status[3] and the presence of (young) children. The presence of children can have several effects on the volunteer activity of the parents. In the first place, bringing up children takes time. In that case we expect that people who have children are less inclined to do volunteer work than childless couples. However, the opposite can also be true. Consider the situation in which people have made a choice to spend most of their time on making a working career and not (yet) on taking children. People with children and 'normal' working hours could have more spare time than 'workaholics' without children.

In the relation between the presence of children in the family and volunteer work not only the number but also the age of the children is of importance. Bringing up young children, say up to 4 years old, takes up very much time. Therefore, there is little time left to do volunteer work. Older children require less time and there is also a tendency for parents to do some volunteer activities that are supplemental to activities of their children (for instance, assistance at school).

Single people form a separate category. One should expect that they are more eager to make social contacts and, therefore, will participate more in volunteer labor. On the other hand, they have to do all the household work on their own and it is possible that they do not have time to engage in volunteer activities. It is also possible that not the need for contacts but the existence of contacts influences volunteer activity (one can be asked for volunteer jobs). All together,

3 Including people who say that they have a 'significant' relation but are not formally married.

there is no clear prediction whether single people do more or less volunteer labor than couples.

Another aspect of the family situation is what we call family culture or life style. Working as a volunteer is not only a matter of (economic) consumption, investment or the availability of time; differences in observed volunteer behavior may also reflect differences in taste. Although this may partly be reflected by variables like sex, age and education we also use the variable *volunteer activity of the partner* (for couples only) as an indicator of family culture. The partner's activity may bear a direct relation to one's own activity as a volunteer. On the one hand the partner's activity in volunteer work may stimulate participation in volunteer work, because partners share a common interest. But on the other hand it may also be that volunteer participation of the partner limits the available time for another member of the family and thus may lower volunteer participation.

Socio-economic environment

Besides personal characteristics and preferences and the family situation it is not unlikely that the socio-economic environment also influences the decision to participate in volunteer work. One can think of the regional labor market situation, city size, urbanization, region (province), governmental provision of collective goods (is volunteer labor a substitute?) and demand for voluntarily supplied services. For instance, in an area with high unemployment some people may think that their chances of getting a paid job are very low and as a substitute they do volunteer work. The city size and the degree of urbanization can be indicators for the kind of social relationship in a local society. In rural areas people might be more inclined to help other people than in cities where one hardly knowns one's neighbors. On the other hand, in cities there are possibly more, and other kinds of activities (cultural, political, Amnesty International, Greenpeace, *etc.*) which encourage people to do volunteer work. With regard to the demand for volunteer services, we assume that the aggregated demand for volunteer work is perfectly elastic. This implies that we assume that when a person wants to do volunteer work, there is always someone (or a group) who wants to use the output produced by the volunteer. Given the fact that the price of the services is zero, this is not an unrealistic assumption. However, it may also be that the need for certain services of particular groups inspires people to do volunteer work. Because all the different aspects of the socio-economic environment are very hard to operationalize with the available data, we choose to use a set of regional dummies which reflect the regional subdivision of The Netherlands into twelve provinces. When significant differences for the provinces are found this can be attributed to the impact of the socio-economic environment.

3 STATISTICAL MODEL AND DATA

In order to detect the determinants of the decision (yes or no) to participate in volunteer work the logit model is assumed to be a suitable tool of analysis. The logit model can be summarized as follows. Let z_i^* $(i = 1, \ldots, n)$ be an observable variable defined by the relationship:

$$z_i^* = \alpha_j^T x_{ij} + \varepsilon_i$$

with α_j $(j = 1, \ldots, p)$ the (logit) coefficients, x_{ij} the elements of the $(n \times p)$ data matrix with n the number of observations and p the number of explanatory variables and ε_i a random error term with $E(\varepsilon_i) = 0$.

The explanatory variables in our model are all *qualitative* variables discussed before, meaning that each variable has a certain number of levels represented by 'dummy' variables. The total number of dummies is p and is equal to the sum of the number of levels of all variables. So, all the x_{ij}'s of the data matrix are 1 or 0. Furthermore, a dummy variable y defined by:

$$z_i = 1, \text{ if } z_i^* > 0$$

$$z_i = 0, \text{ otherwise}$$

is observed. The situation $z_i = 1$ corresponds to the individual participating in volunteer work and, if not, the situation $z_i = 0$ occurs. It follows that:

$$P(z_i = 1) = P(\varepsilon_i > -\alpha_j^T x_{ij}) = 1 - F(-\alpha_j^T x_{ij})$$

where P denotes the probability of participating in volunteer work and F is the cumulative density function for ε. If F is the logic distribution the model is called the logit model. It should be noted that z follows a Bernoulli distribution with $P(z_i = 1) = 1 - F(-\alpha_j^T x_{ij})$ and $P(z = 0) = F(-\alpha_j^T x_{ij})$. Maximizing the likelihood function with respect to α_j gives the maximum likelihood estimates of α_j. The logit coefficients α_j are estimated with the LIMDEP statistical package (for details see the LIMDEP manual by Greene, 1986). The estimated coefficients are differences on the log-odds scale and are expressed *versus* the group of controls. More details about the way we used the logit model can be found in Van Dijk and Folmer (1985).

According to Keeley (1981) there is much more confusion concerning the proper way to estimate the parameters of a model with the number of hours spent on volunteer work as the dependent variable. The main source of this confusion is that the dependent variable has a distribution truncated at zero, due to the fact that a large majority of the Dutch population supplies the limit value of zero hours (from 50 to 60 percent). Therefore, we have to estimate a relationship for a limited dependent variable.

Some researchers solve this problem by excluding the individuals who supply zero offers. However, this procedure leads to biased estimates because of the selectivity bias. Another bias occurs when the model is estimated for the entire sample, including the individuals for whom zero hours of volunteer work are observed, because the possibility that the optimal number of hours for these individuals would be negative cannot be taken into account. For a further explanation see Keeley (1981). To obtain theoretically appropriate estimates we follow Keeley's suggestion to use *tobit* (*Tob*in's pro*bit*) analysis.[4]

The tobit model we use assumes that the hours of volunteer work are distributed normally and truncated at zero. The model formally reads as

$$y_i = \begin{cases} \sum_{j=1}^{p} x_{ij}\beta_j + \varepsilon_i & \text{if RHS} > 0 \\ 0 & \text{if RHS} \leq 0\,, \end{cases}$$

with y_i ($i = 1, \ldots, n$) the number of hours of volunteer labor for individual i in one week, β_j ($j = 1, \ldots, p$) the tobit coefficients, x_{ij} are the elements of the ($n \times p$) data matrix (the same as for the logit model) and ε_i the random error term (distributed as $N(0, \sigma^2)$).

The *linear predictor* η_i is defined as

$$\eta_i = \sum_{j=1}^{p} x_{ij}\beta_j, \text{ then: } y_i = \begin{cases} \eta_i + \varepsilon_i & \text{if RHS} > 0 \\ 0 & \text{if RHS} \leq 0\,. \end{cases}$$

The *expected* or average value of the observed y_i is *not* given by η_i (as with OLS) but is equal to:

$$E(y_i) = \eta_i F(\eta_i/\sigma) + \sigma f(\eta_i/\sigma)\,,$$

where F is the cumultative normal density function, which gives the probability of observing $y_i > 0$, f the normal density function, and σ the standard error of ε_i. The tobit coefficients β_j are also estimated with the LIMDEP statistical package mentioned before.

The expected value $E(y_i)$ is increasing with higher values of η_i and thus also with higher values of the β_j's and this implies that the tobit coefficient is an indicator of the number of hours spent on volunteer work for individuals with different characteristics. However, it is also interesting to know how a (small) change in one of the explanatory variables affects the hours volunteered or, in terms of our model, how a change in x_i results in a change in η_i and $E(y_i)$.

4 Details about tobit models can be found in Tobin (1958), Keeley (1981), Maddala (1983) and Amemiya (1984).

However, the change in $E(y_i)$ does not solely depend on the change in x_i but also on the initial value of η_i without the change. In other words, the change in $E(y_i)$ due to a change in x_i varies over the range of η_i. Therefore, we also calculate the change in x_i which varies over the range of η_i. We also calculate the change in $E(y_i)$ for each level of the explanatory variables with respect to $E(y_i)$ for the mean of the population. This so-called *partial effect* reflects the difference in expected value for a change in one variable while the other variables are held constant at the mean.

The data set used for the empirical analysis is the 1982 NPAO survey which will be briefly described below. The NPAO survey was held to gain insight into labor market behavior of the (potential) Dutch labor force. Besides a wide range of personal and family characteristics, the survey also contains information about participation and time spent on volunteer work. The respondents of the NPAO survey citizens aged between 16 and 64 years of age. The sample size is 2677 of which 2165 can be used because some cases lack data for variables needed for the empirical analysis. The respondents were asked if they did *unpaid labor* for persons outside their own family, for an organization, for a good cause, *etc.* Moreover, they were asked if that unpaid labor was also *volunteer labor*, and if it was: how many hours they spent on it in one week. The definition of volunteer labor in this survey is: unpaid labor in favor of other persons or society in an *organized setting*. This definition closely resembles the widely used definition of the ICV mentioned in the introduction. Appendix A gives some summary statistics of the Dutch volunteer labor force in 1982. In Heijnen and Maas (1984) more detailed information about the NPAO survey can be found.

4 ESTIMATION RESULTS

Before the results of the models which were finally selected will be discussed, some remarks will be made about the model *selection process*. As mentioned before, we would like to get insight in both the participation decision (yes or no) and the decision of the number of hours volunteered. Theoretically, we expect the same variables to be relevant for both decisions. The decision of the number of hours is influenced by the participation decision: it is clear that the number of hours will automatically be zero when the participation decision is no. The most valuable insights can be obtained when the results of the tobit analyses are interpreted in combination with the logit results. Therefore, we have opted to use the same model specification for both the logit and the tobit model. The selection of the variables is based on the results of alternative specifications for the tobit model. The specification finally chosen for the tobit model will also be used for the estimation of the logit model. All variables for which there is hardly any doubt that they have to be incorporated in the model are included. As criteria for model selection for the more doubtful variables we used the *t*-values and the likelihood radio test.

We started with a tobit model in which all relevant variables mentioned in section 2 were included, *except income*. As mentioned before the inclusion of this

variable is doubtful due to the high correlation with other variables. Adding income to the model did not improve the overall fit, lowered the significance of some other variables and did not lead to significant estimates for the income variable itself. When variables, which are highly correlated with income, are deleted and income is included in the model results are less satisfactory than without income. Therefore, the variable income is not included in the final model.

None of the provincial dummies, which were used as proxies for differences in the *socio-economic environment*, turned out to be significant.[5] Therefore, the provincial dummies are not included in the final model. Finally, besides the interaction of sex and labor market situation, which out to be significant, several other interactions are tried out. None of these interactions improved the fit of the model.

The logit (α's) and the tobit (β's) coefficients and the corresponding standard errors of the finally selected model can be found in Table 1. Parameter estimates are obtained for all levels, except for the first level of each variable for which only one overall parameter is estimated. This is because the combined set of characteristics for the first level of each variable is used as the group of controls or reference group. The estimated parameters for the other levels express the differences *versus* the group of controls.

The participation probability can be derived from the logit coefficients in Table 1.[6] A positive coefficient indicates a higher probability of participating in volunteer work than the group of controls and a negative one the opposite. From the estimated tobit coefficients in Table 1 we can calculate the linear predictor η_i and the expected value $E(y_i)$ for each group.[7] Finally, the tobit coefficients are used to calculate the difference in expected value for a change in one variable while the other variables are held constant at the mean, the so-called *partial effect*. The last column of Table 1 gives, for each level of the variables, the partial effect which is expressed as the difference from the expected value for the mean of the total population which equals 1.16 hours.[8]

5 This could be due to the fact that the provincial dummies are not appropriate proxies for socio-economic environment. However, a more proper operationalization of the socio-economic environment is not possible with the available data.

6 The logit coefficients can be translated into participation probalities (estimated participation rates). Therefore, we use the formula $exp(\eta)/[1 + exp(\eta)]$, where η is the sum of the logit coefficients (just as for the tobit coefficients) for a particular group in Table 1. The participation probability for the group of controls derived from the logit estimates equals 0.27.

7 For example: the η for the group of controls is simply equal to -6.18, the β for this group, because the other x_j are equal to zero. For the group of housewives between 30 and 35 years old, with an upper medium level of education, with a young child and a partner who is volunteer the η is equal to the sum of relevant tobit coefficients for this group plus the coefficient for the group of controls: $-2.32 + 3.14 + 4.58 - 0.03 - 0 - 6.18 = -0.81$. Note that most of the values of η_i will be less than zero, because the participation in volunteer work is less than 50%, because $F(0, \sigma) = 0.50$.

The expected value can be calculated with the formula for $E(y)$ and gives the average value of $-6.18*F(-6.18/8.13) + 8.13*f(-6.18/8.13) = 1.05$ hours a week for the group of controls.

8 The expected value for the mean of the sample is calculated by multiplying the β_i's by the share in the sample for each level of the variable. Note that expressing the partial effect in this way leads

TABLE 1 – LOGIT AND TOBIT ESTIMATES AND PARTIAL EFFECTS

Group	Logit model		Tobit model		Partial effect
	Estimate	Standard error	Estimate	Standard error	
Controls[a]	−0.98	0.24	−6.18	0.63	1.16[b]
Sex and labour market position					
Male, ≥38 hours work[a]	.	.	.	.	0.49
Male, <38 hours work	−0.63	0.32	−1.89[c]	1.43	−0.03
Male, 0 hrs, job searcher	−0.18[c]	0.32	2.38	1.34	1.37
Male, 0 hrs, no job search	−0.73	0.23	−3.15	1.01	−0.30
Female, ≥38 hours work	−0.98	0.23	−4.60	1.03	−0.54
Female, 20–37 hours work	−0.83	0.23	−3.10	1.05	−0.29
Female, <20 hours work	−0.75	0.26	−3.33	1.18	−0.23
Female, 0 hrs, job searcher	−0.89	0.42	−4.18	1.90	−0.48
Female, 0 hrs, no job search	−0.58	0.14	−2.32	0.61	−0.13
Age					
16–24 years[a]	.	.	.	.	−0.43
25–29 years	0.45	0.20	2.70	0.91	0.15
30–34 years	0.62	0.21	3.14	0.96	0.27
35–39 years	0.96	0.22	4.15	1.00	0.57
40–49 years	0.75	0.21	3.15	0.94	0.37
50–59 years	0.30[c]	0.23	1.33[c]	1.02	−0.18
≥60 years	0.04[c]	0.30	1.65[c]	1.29	−0.11
Education[d]					
Primary education[a]	.	.	.	.	−0.50
Lower medium level	0.48	0.17	2.17	0.75	−0.08
Upper medium level	0.98	0.20	4.58	0.88	0.58
Higher education: vocational	0.79	0.24	3.82	1.07	0.34
Higher education: scientific	1.06	0.32	4.06	1.43	0.42
Students	0.92	0.28	3.96	1.28	0.39
Family situation					
No children[a]	.	.	.	.	0.19
Child 5–15 years	0.00[c]	0.13	−0.10[c]	0.61	−0.01
Child <5 and 5–15 years	−0.02[c]	0.22	−0.68[c]	0.99	−0.14
Child <5 years	−0.20[c]	0.21	−0.03[c]	0.96	0.02
Partner is volunteer[a]	.	.	.	.	0.62
Partner is no volunteer	−1.27	0.11	−4.72	0.51	−0.48
No partner	−0.47	0.22	−0.61[c]	1.00	0.46
σ			8.13	0.26	
Log-likelihood		−1151		−2773	
Restricted (Slopes = 0) Loglikelihood		−1291		−5837	
Sample size		2165		2165	

[a] The group of controls has the characteristics of the first level of each variable.
[b] Mean expected value. Note: 0.50 hours means 30 minutes.
[c] Estimate is statistically *not* significant at the 0.10 level.
[d] Educational levels are based on the standard educational classification (SOI: 'standaard onderwijsindeling') of the Dutch Central Bureau of Statistics.

The results for the logit and the tobit estimates and the derived partial effects will be discussed simultaneously. The signs and magnitudes of the logit and the tobit coefficients show, in general, the same pattern. This implies that, in general, higher participation rates are accompanied by more hours of volunteer work. This is what we expected in section 2 where no distinction was made between the *a priori* expectations with regard to the participation and the hours decision. The major exceptions are the male job searchers as will be discussed below.

We start with the variables *sex* and *labor market situation*. In general, women are less in volunteer work both with regard to the participation probability and the number of hours. This difference might be due to the definition of volunteer work used in the survey: females possibly do more volunteer work in an unorganized setting, which especially includes care-taking activities (helping their parents, neighbors *etc.*).

Women working full-time make the lowest contribution to volunteer work. The probability of participation varies inversely with the hours of paid work and the same pattern appears for the differences in hours supplied per group. Female job searchers show the same result as women who work full-time. Women working full-time supply about one hour less time on volunteer work than their male colleagues. It is reasonable to say that for women volunteer work competes with a paid job, contrary to men. This confirms the hypothesis that women, even if they have a paid job, do most of the household work.

For *males* we see that new working full-time as well as job searchers show the highest probability of participating. However, with regard to the number of hours the job searchers are much more active. They supply about one hour more than full-time working men. So, male job searchers do not differ from males working full-time with regard to the participation rate, but when participating they supply a relatively larger amount of time. Looking at the logit and tobit estimates for part-time or non-working (and not looking for a job) men we may conclude that they participate less than the other two groups of males and that the number of hours supplied is also smaller.

As we expected, the variable *age* gives a beehive-shaped curve for the participation probability as well as the hours supplied. The top of the curve lies in the age category 35–39. The lowest number of hours is supplied by the age group 16–24. The partial effects show that this group spends one hour less than the age group 35–39.

The variable *education* shows a significant relation with volunteer activity. The logit and tobit results show that higher education goes together with a higher participation rate and the supply of more time to volunteer work. There is a clear

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to another result than when the change in $E(y_i)$ due to a change in x_i is evaluated *versus* the group of controls, because the value η_i for the mean of the population is not the same as the η_i for the group of controls (see previous footnote).

distinction between the two lowest educational levels and the other categories. The high probability – in spite of the little spare time full-time working men have – is the extra status or profitable contacts which can be obtained from the combination of paid work and volunteer work. The result that unemployed male job searchers spend relatively more time on volunteer work than working males can be interpreted as (weak) evidence for an investment motive to get on-the-job training or valuable contacts. Because the male job searchers also spend more time on volunteer work than other non-actives do, it is not only a matter of having more 'free' time when you are unemployed. A combination of the investment and consumption motives together with the near absence of a time constraint is the partial effects show that there is a difference of more than one hour between the upper medium level and those with only primary education. The results confirm our expectation that higher education is associated with spending more leisure time in an active way.

For the presence of *children* we expected that individuals with young children would participate less in volunteer activities and supply less hours because of the time take up raising them. However, no significant differences are found with regard to the presence of children.

It is likely that volunteer labor has something to do with *family culture*. The empirical results show that people with a partner (or a grown-up member of the family) active in volunteer work do significantly more volunteer work themselves. According to the logit estimates, single people have a lower participation probability, but when they do participate they spend a relatively large number of hours. The partial effect shows that they spend half an hour more than the mean of the population.

As mentioned in section 2, the explanatory variables are related to several motives to do volunteer work in combination with time constraints. Although there is no one-to-one correspondence between these aspects and the selected variables, some tentative conclusions can be drawn.

For non-active people we may assume that the consumption motive is the only reason why they should participate in volunteer work, because, in general, they are not looking for a job and thus will not have future benefits from higher wages. The high number of hours female non-actives spend on volunteer work compared to other females may indicate that for this group volunteer work is partly a substitute for paid work. However, this conclusion is not confirmed for male non-actives. Volunteer work as a way to spend leisure time can be seen as consumption and is a matter of taste or life style. The significance of the variables education and a volunteering partner support this view. The beehive-shaped age curve is an argument for the existence of altruism. And if altruism is seen as a need that can be fulfilled by doing volunteer work this is a consumption motive.

Our results provide some evidence for the presence of an investment motive. An indication for the existence of such a motive is the relatively high participation probability (*not* hours) of full-time working men. A possible explanation for this

most likely explanation for the high number of hours spent on volunteer work for male job searchers.

The existence of a time constraint is most clear for the group of working women. The fewer hours they work the more they participate in volunteer work. Although taking care of children takes a lot of time the significant results with regard to the presence of children do not indicate that this negatively affects taking part in volunteer work.

5 CONCLUSION

The purpose of this study is to gain insight into the determinants of volunteer work in The Netherlands. In section 2 we discuss several motives to do volunteer work on the basis of economic theory and the variables by means of which these motives can be operationalized. Because there is no generally accepted theory with regard to taking part in volunteer work, our empirical analysis on Dutch microdata from the NPAO survey 1982 is rather explorative.

Our empirical results show that statistically significant determinants for both decisions are sex in combination with labor market position, age, education and the volunteer activity of other family members. Depending on the individual characteristics evidence is found that both the consumption and the investment motive explain taking part in volunteer work. Furthermore, for some groups time constraints limit the contribution to volunteer activities. For some groups a relatively low participation probability is accompanied by a relatively high number of hours supplied when the decision to participate is yes.

On the basis of our preliminary results we can conclude that demographic changes like an aging population, socio-economic changes, increasing participation of women in the labor force and the development of unemployment may have important consequences for the future supply of volunteer labor. This may quite possibly lead to a substantial reduction of the volunteer sector. Given the large size of the volunteer sector at this moment one of the consequences of this reduction is a substantial lower welfare level. Policymakers have to be aware of these effects when they decide to cut government services arguing that people have to take care of each other without government interventions, for instance by means of volunteer work.

APPENDIX A

SHARE IN THE SAMPLE, PARTICIPATION RATE AND SUPPLIED HOURS OF VOLUNTEER LABOR (IN ONE WEEK) PER VOLUNTEER AND FOR THE TOTAL NUMBER OF INDIVIDUALS IN A PARTICULAR GROUP FOR THE NPAO SURVEY 1982

	Share in the sample	Participation rate	Time spend per volunteer	group
Total	100.0%	28.4	4.30	1.22
Male	50.3	32.7	4.56	1.49
Female	49.7	24.0	3.92	0.94
	100.0%			
Male, ≥38 hours work*	34.0	38.0	4.26	1.62
Male, <38 hours work	2.8	26.2	5.31	1.39
Male, 0 hrs, job searcher	2.9	27.0	12.04	3.25
Male, 0 hrs, no job search	10.5	21.1	3.03	0.64
Female, ≥38 hours work	8.0	19.7	3.15	0.62
Female, 20–37 hours work	5.8	24.8	4.68	1.16
Female, <20 hours work	4.6	25.3	3.20	0.81
Female, 0 hrs, job searcher	1.9	19.1	3.35	0.64
Female, 0 hrs, no job search	29.5	25.2	4.09	1.03
	100.0%			
16–24 years*	24.6	23.6	3.39	0.80
25–29 years	12.8	29.4	5.44	1.60
30–34 years	13.4	32.3	4.52	1.46
35–39 years	11.8	41.8	3.95	1.65
40–49 years	16.2	33.9	4.40	1.49
50–59 years	13.5	21.9	3.38	0.74
≥60 years	7.7	13.9	7.99	1.11
	100.0%			
Primary education*	20.3	17.3	4.51	0.78
Lower medium level	41.6	28.6	4.16	1.19
Upper medium level	16.8	36.6	4.84	1.77
Higher education: vocational	7.0	37.1	4.80	1.78
Higher education: scientific	2.7	45.8	4.19	1.92
Students	11.6	25.8	3.10	0.80
	100.0%			
No children*	51.4	24.1	4.81	1.16
Child 5–15 years	33.3	32.6	3.93	1.28
Child <5 and 5–15 years	7.5	33.7	3.74	1.26
Child <5 years	7.8	33.1	3.87	1.28
	100.0%			
Partner is volunteer*	45.7	40.4	3.74	1.51
Partner is no volunteer	48.3	16.8	4.94	0.83
No partner	6.1	29.0	6.93	2.01
	100.0%			

* Characteristics of the group of controls.

Note: 2.50 hours, means two hours and 30 minutes.

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Summary

VOLUNTEER LABOR SUPPLY IN THE NETHERLANDS

The main aim of this paper is to provide insight in the determinants of the decision to participate (yes or no) in volunteer work and the decision with regard to the number of hours spent on volunteer work. These decisions are empirically analyzed with Dutch microdata for 1982 by means of a logit and a tobit model. The results indicate that age, education, family culture and the position on the labor market in combination with sex are important determinants of volunteer labor supply.