
Determining Factors in Middle-Aged and Older Persons' Participation in Volunteer Activity and Willingness to Participate*

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This paper examines the factors that determine participation in volunteer activities by older persons, as well as their willingness to take part. The examination is based on empirical analysis, using microdata from a survey on middle-aged and older persons. Many Japanese workers reach mandatory retirement at age 60, and particularly among men, retiring from the market labor force represents a major turning point. The analysis results reveal that participation in volunteer activities by older persons is in a trade-off relationship with market labor based on wages; the probability of taking part in volunteer activities tends to be lower if the market wage rate is higher. Among men, a relationship is seen between age and participation in volunteer activities, and the results reveal that the probability of their participation in volunteering forms a U-shape bottoming at age 60.

I. The Situation of Older Persons and Volunteer Activities in Japan

In Japan, the number of people taking part in volunteer activities started to increase after the Kobe earthquake of 1995—the year now known as “Volunteer Year One.” Volunteer activities have grown increasingly conspicuous since then, illustrated by the promulgation of the Act on Promotion of Specified Non-Profit Activities in 1998. Figure 1 shows data on the start of volunteer activities by different age groups, taken from microdata to be analyzed later. As this clearly shows, the proportion of people involved in volunteer activities has increased in all age groups since the 1990s.

Figure 2 shows the number of people involved in volunteer activities by age groups, from the results of the Survey on Time Use and Leisure Activities in 2001, 2006 and 2011. In the 2011 survey, two spikes can be seen in the number of people involved in volunteer activities, one in the early to mid-40s and the other in the early to mid-60s. The second of these can also be seen in the 2001 and 2006 surveys. This second spike represents the first postwar “baby boomer” generation (i.e. persons born between 1947 and 1949¹). As of 2013, people in the first baby boom generation were aged between 64 and 66. The population of Japan was significantly expanded by this generation. It was then further expanded by the

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¹ Altogether, 8.04 million births were recorded in these three years. The number in 2011 was 1.06 million births, only around 40% of the 2.70 million recorded in 1949 (from annual estimates in MHLW Vital Statistics).

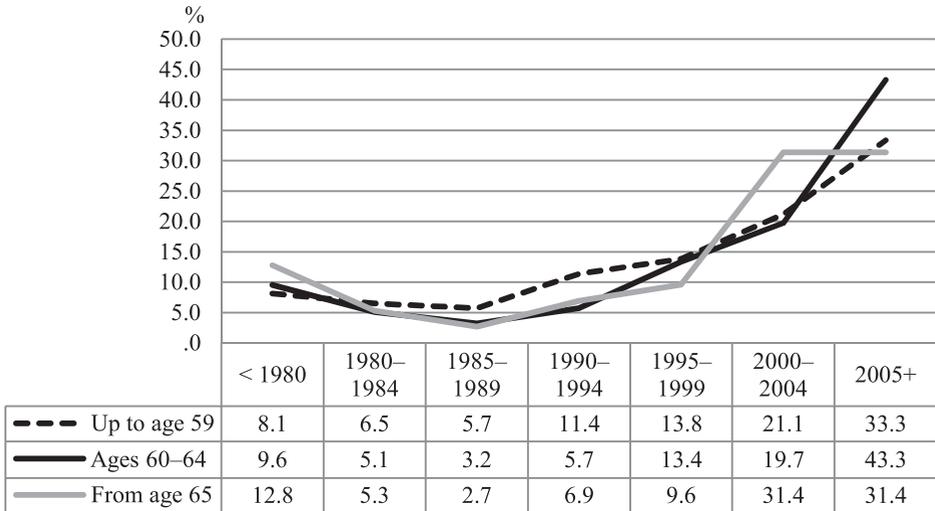
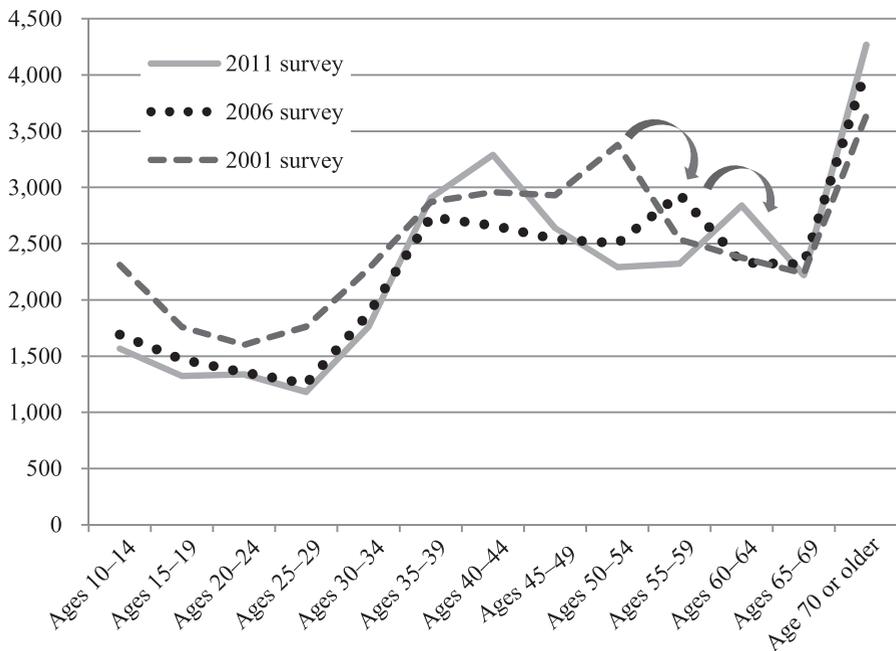


Figure 1. Year of First Volunteer Activity by Different Age Groups



Source: Ministry of Internal Affairs and Communications, *Survey on Time Use and Leisure Activities*.

Figure 2. Trends in Numbers Involved in Volunteer Activities by Age Group (2001, 2006, 2011)

generation of children born to this generation (the “second baby boom generation”), but entered a shrinking trend thereafter.

In many Japanese companies where mandatory retirement at age 60 is the norm, mass retirements of people in this generation were predicted to occur between 2007 and 2009. When that happened, the labor force that had supported Japan’s economic boom years was expected to continue contributing to society and the community, rather than simply ceasing to exist as a labor force.

In view of the above, empirical research on determining factors behind participation in volunteer activities by middle-aged and older persons is an important issue relevant to Japan’s current situation. But while many previous studies have highlighted the large proportion of older persons taking part in volunteer activities, hardly any empirical analysis has been carried out on middle-aged and older persons; the factors that influence their participation in volunteer activities remain unclear.

Besides this, there must also be people who, though not currently participating in volunteer activities, hope to do so in future. Analyzing their motivations will surely have vital implications for policies designed to promote volunteer activities. In previous studies on the volunteer labor supply, the analysis has nearly always assumed the two-way choice of taking part versus not taking part; no empirical analysis has been made of determining factors behind the willingness to take part.

In this paper, therefore, microdata from a survey conducted by the Japan Institute for Labour Policy and Training (JILPT) will be used to conduct empirical research on participation in volunteer activities by middle-aged and older persons, as well as determining factors behind their willingness to take part, which have not been analyzed in the past.

The composition of the paper is as follows. Section II will survey previous research on the volunteer labor supply, Section III will describe the econometric framework for empirical analysis, and Section IV will carry out empirical analysis and explain the measurement results. Finally, the results obtained from empirical analysis will be summarized.

II. Previous Studies and Characteristics of Analysis by This Paper

Theoretical frameworks on participation in volunteer activities include those based on the altruistic behavior of “not for oneself but for someone else” (Becker 1974, 1976, 1981, 1991; Barro 1974; Andreoni 1989, 1990; Sen 1982, 1988, 1985), and those based on selfish behavior. The latter is a consumption model based on a utility function, in which volunteer activities are treated as consumer goods (Menchik and Weisbrod 1987; Freeman 1997; Yamauchi 1997, etc.). Besides these, there is also the human investment model (Menchik and Weisbrod 1987) based on the theory of human capital (Becker 1975). Most previous empirical analysis studies have been based on selfish behavior models.

The main Results of previous studies based on microdata will be surveyed below.² First, it has been shown that volunteer participation is influenced by gender, age, educational background, marital status, the existence of children and other individual attributes in previous studies.

For example, previous studies have revealed that women are more likely than men to take part in volunteer activities, and that they spend more time on volunteer activities. Other trends are that people with children are more likely to take part in volunteer activities and spend more time on such activities. On the other hand, the probability of participation tends to be lower and the amount of time spent on volunteer activity less when nursing infants.³ In a study of married women, Carlin (2001)⁴ points out that the probability of taking part in volunteer activities increases but the time spent on volunteer activities decreases as the number of children increases.

On the subject of age, both the probability of taking part in volunteer activities and the time spent on such activities tend to change with age. In their analysis, Menchik and Weisbrod (1987) point out that, while the time spent on volunteering increases with age, it conversely decreases after a certain age (43). In the analysis by Vaillancourt (1994), changes with age were analyzed separately by gender. Here, it was shown that the most likely age for both males and females is 15–19, and that while men are more likely to take part in volunteer activities between the ages 25 and 54, the probability decreases between 55 and 69. For women, the probability of participation clearly decreases after the age of 70. In America and Canada, there is a particular socio-cultural background to the effect that volunteer activities in student years are seen as important in educational terms. Such experience is also valued when taking up employment, etc. For men, in particular, volunteer activities seem to be perceived as a means of forming human capital.

Another study has demonstrated that educational background has a strong influence on participation in volunteer activities, and that persons with a higher level of final education are more likely to take part in volunteer activities (Vaillancourt 1994). Moreover, the higher the parents' educational background, the longer the time spent on volunteer activities (Menchik and Weisbrod 1987).

Turning next to the impact of income factors on participation in volunteer activities as

² See Ono and Ma (2012) for a more detailed overview of empirical research on the volunteer labor supply.

³ Menchik and Weisbrod (1987) conducted tobit analysis on determining factors behind hours of volunteer labor supply, using microdata from a survey conducted by Morgan, Dye and Hybels (1977). Vaillancourt (1994) conducted probit analysis on determining factors in the volunteer labor supply (the probability of taking part in volunteer activities), using microdata from Canada's 1987 LFS (Labor Force Survey).

⁴ In an analysis focusing on married women, Carlin (2001) uses microdata from a 1975–1976 US survey on non-working time to conduct probit analysis on the probability of taking part in volunteer activities. Carlin estimates the volunteer labor supply time function, taking account of selection bias based on the choice of whether or not to take part in volunteer activities.

found in previous studies, Menchik and Weisbrod (1987), Vaillancourt (1994) have proved that the higher the non-earned income, the longer the time spent on volunteer activities, and the higher the market wage rate, the shorter the time spent. On the other hand, Freeman (1997)⁵ discovered that the higher the human capital (the higher the opportunity cost), the larger the volunteer labor supply. Freeman points out that volunteer supply activity can only partly be explained with standard models of labor supply. Though focusing only on married women, Carlin (2001) comes to a similar conclusion; the higher the market wage, the larger the volunteer labor supply (probability of participation, hours of supply), but conversely, time spent on volunteer activities decreases as working hours increase.

Analysis results of empirical research on volunteering in Japan can be summarized as follows. In terms of individual attribute factors, women are more likely to take part in volunteer activities than men, while a higher educational level and age increase the probability of participation. The probability of participation also increases among married respondents and those with children. As for income factors, the probability of taking part in volunteer activities is inversely proportionate to the householder's working hours, working days, and wage rate. By contrast, it has also been demonstrated that the higher the annual household income, the higher the probability of taking part in these activities. Besides this, it has also been confirmed that the smaller the urban scale the higher the probability of taking part in volunteer activities, and that when other factors are constant, there are regional differentials in the probability of volunteer participation (Atoda, Kim, and Maekawa 1999; Atoda and Fukushige 2000; Yamauchi 2001; Ono 2006; Moriyama 2007).

Although there has been more empirical analysis of volunteer activities in Japan recently, a number of issues still remain in connection with previous studies, as stated above. In contrast to these, the main features of this paper are as follows.

Firstly, the analysis in this paper targets middle-aged and older persons in the 55–69 age group, which have not been analyzed until now, and focuses on the determining factors behind their participation in volunteer activities.

Secondly, this paper conducts empirical analysis on determining factors behind willingness to participate in volunteer activities, which again have not been analyzed by previous studies. After clarifying the characteristics of persons hoping to take part (as “reservists” for those actually taking part), this paper attempts to propose policies for promoting participation in volunteer activities by middle-aged and older persons in future.

Thirdly, the determining factors behind participation in volunteer activities and willingness to participate could differ, depending on the group in question (for example, by gender or age group). In this paper, therefore, group-based analysis is conducted using sub-samples and the differences between groups are examined.

Fourthly, this paper uses a structural probit analysis model to deal with endogenous

⁵ Freeman (1997) used microdata from the US 1989 CPS and 1990 Gallup poll to conduct probit analysis on the probability of taking part in volunteer activities and OLS on hours of volunteer labor supply.

problems in market wages and the selection of employment or retirement activity. These issues, again, have not been addressed by previous studies. Specifically, this paper uses an estimate of wage rates calculated from the wage function in probit analysis. It also uses Heckman's two-step estimation method (Heckman 1979) to deal with the problem of sample selection bias in estimates of the wage function.

III. Method of Quantitative Analysis

1. Estimation Models

First, the structural probit model shown in equation (1) is used to analyze the various factors that influence decisions to participate in volunteer activities by middle-aged and older persons, as well as their willingness to participate.

$$\Pr(y_i = 1) = a + \beta_x X_i + \beta_{wage} \hat{w}age + u_i > 0 \quad (1)$$

In equation (1), subscript i represents individual workers, while $\Pr(y_i = 1)$ indicates the probability function for participation in volunteer activities and willingness to participate. These are dichotomous variables (if taking part = 1, otherwise = 0, or if willing to participate = 1, otherwise = 0). a is a constant term, X represents factors that influence the choice to participate in volunteer activities (or wish to participate), and u indicates the error term. To address the problem of endogeneity, the estimated value of the wage rate $\hat{w}age$ calculated from the wage function is used. β_{wage} and β_x are the respective estimation coefficients. This is a structural equation, using years of experience and regional block variables as distinguishing variables.

Next, the wage function is indicated by equation (2.1), equation (2.2), equation (2.3) and equation (2.4).

$$Lnwage_i = b + \gamma_z Z_i + \varepsilon_{1i} \quad (2.1)$$

$$\Pr(=1) = \delta M_i + \varepsilon_{2i} > 0 \quad (2.2)$$

$$\varepsilon_{1i} \sim N(0, \sigma^2), \quad \varepsilon_{2i} \sim N(0,1)$$

$$Lnwage_i = a + \gamma_z Z_i + \gamma_\lambda \lambda_i + v_i \quad (2.3)$$

Here, $Lnwage$ is the logarithm of the wage rate, b is a constant term, Z indicates the various factors, γ_z is the estimation coefficient, and ε indicates error. Using the estimation of the wage function shown in equation (2.1) makes it possible to address the problem of endogeneity in wage rates as well as decision-making for participation in volunteer activities and willingness to participate. The problem still remains, however, that hours of volunteer labor supply can only be observed for persons in volunteer activities (sample selection bias). In other words, if $corr(\varepsilon_1, \varepsilon_2) = \rho$ (where ε_1 is the wage function error and ε_2 the

probit analysis error for the probability of taking part in volunteer activities), consistent and unbiased estimates cannot be calculated through econometric analysis using equation (2.1). To address this problem, the correction term λ (inverse Mills ratio) must be obtained from the probit analysis shown in equation (2.2), and the selection bias corrected by calculated λ into equation (2.1) (Heckman 1979). Equation (2.3) shows the equation for estimation under Heckman's two-step estimation method for correcting selection bias. Here, V indicates the error term.

2. Data Used and Setting of Variables

The analysis in this paper uses microdata from the Survey on Hiring and Employment Status of Older Persons conducted by the Japan Institute for Labour Policy and Training (JILPT). This was a major nationwide survey aimed at male and female individuals in higher age brackets (55–69), with the target group (sample size: 5,000) sampled at random from the Basic Residents Register using stratified two-stage systematic sampling. The survey method was by interview visit and questionnaire placement. The survey was conducted between August 20th and September 15th, 2009, when the first baby boom generation would have been aged 60–62. Valid responses were received from 3,602 respondents, giving a valid response rate of 72.0%. The sample sizes in terms of the target groups' age composition were 1,195 respondents aged 55–59, 1,257 aged 60–64 and 1,150 aged 65–69. As well as ascertaining the hiring and employment status of middle-aged and older persons, this survey included many questions on the state of volunteer activities by middle-aged and older persons, their individual attributes, family composition, and so on.

The setting of explained variables in this analysis will now be explained. In the questionnaire, the question "Are you involved in volunteering or other social contribution activities?" had three possible answers, namely "1. Yes, 2. Want to be, 3. Do not want to be." A dichotomous variable was set for participation in volunteer activities, i.e. respondents answering "1. Yes" = 1, others = 0. A dichotomous variable was also set for willingness to participate in volunteer activities, i.e. respondents answering "2. Want to be" = 1, those answering "3. Do not want to be" = 0.

Explanatory variables were divided into four factor groups, namely (i) income factors, (ii) individual attributes, (iii) family composition, and (iv) others, and proxy variables were set for each. The setting of each variable will be explained below.

Firstly, wage rates and non-earned income were set as income factors.

(1) On wage rates, the estimated value of the wage function was used to address the problem of endogeneity.

(2) Savings and the income of other family members were set as proxy indicators for non-earned income. In research by Menchik and Weisbrod (1987), among others, it has been shown that the greater the non-earned income, the higher the likelihood of taking part in volunteer activities. Here, these estimated values are expected to be positive values.

Secondly, the respondents' age, square of age, and educational background were set

as individual attribute factors.

(1) As stated above, Menchik and Weisbrod (1987) show, through empirical analysis on volunteer labor supply aimed at all age groups in America, that age and the probability of participation are in an inverted U-shaped relationship. Age and the square of age were set to examine the influence of age.

(2) An educational background dummy was set. The theory of human capital holds that the larger the human capital, the higher the market wage. However, since wages are controlled in this paper's analysis, the estimation of educational background is thought to have appeared as an educational background effect other than market wage (for example, differences between educational backgrounds in awareness and activity related to social contribution).

(3) A state of health dummy was set to examine the impact of health.⁶ It is surmised that the state of health influences social activity by older persons, and that individuals in good health are more likely to take part both in market labor and volunteer activities than those in poor health.

(4) Gender differentials are thought to exist in volunteer labor supply activity, due to differences between men and women in employment status and leisure preferences. Moreover, Carlin (2001), Segal and Weisbrod (2002), Ono (2006), and Moriyama (2007) have demonstrated that women are more likely to participate in volunteer activities than men are. A male dummy was therefore set to control the impact of gender.

Thirdly, the spouse-related status, number of cohabiting relatives, existence of family nursing care, and independence of children were set as family composition factors. First, the presence or absence of a spouse and the spouse's employment status, the number of cohabiting relatives and the independence of children all influence employment decisions in the form of reservation wages. Therefore, these factors could also influence participation in volunteer activities. To control the impact of these factors, the spouse's employment status,⁷ the number of cohabiting relatives, and the independence of children⁸ were set as explanatory variables. Meanwhile, Atoda and Fukushige (2000) have shown that negative experience in the past has an impact on the volunteer labor supply. In this paper, the family nursing care experience dummy is used as a proxy for past negative experience.

⁶ See Oishi (2002), Seike and Ma (2009) and others on the impact of health on employment activity by older persons.

⁷ The spouse's employment status was divided into four types, namely (i) no spouse (no spouse dummy), (ii) spouse works as a regular employee (spouse/regular dummy), (iii) spouse works as a non-regular employee (spouse/non-regular dummy), and (iv) spouse has retired (spouse/not in employment dummy). Dummy variables were set for each of these.

⁸ The independence of children was divided into five dummies, namely (i) no children (childless dummy), (ii) children already economically independent (children independent dummy), (iii) it will probably take around 1–4 years before children stop needing financial support (1–4 years support dummy), (iv) it will probably take at least 5 years before children stop needing financial support (more than 5 years support dummy), and (v) prospects unknown dummy. Dummy variables were set for each of these.

Table 1. Descriptive Statistics

	Participation in social contribution activities		Willingness to participate in social contribution activities	
	Average value	Standard deviation	Average value	Standard deviation
Explained variables				
Participation in social contribution activities	0.1327	0.3393		
Willingness to participate in social contribution activities			0.3528	0.4780
Explanatory variables				
Income factors				
Wage rate (estimated)	7.3055	0.3706	7.3116	0.3705
Savings	0.5600	1.1366	0.5339	1.1074
Income of other family members	15.5737	20.1569	14.9685	19.6981
Individual attribute factors				
Age				
55–59	0.3577	0.4795	0.3706	0.4831
60–64	0.3390	0.4735	0.3432	0.4749
65–69	0.3033	0.4598	0.2862	0.4521
Component ratio of educational backgrounds				
Junior high school leavers	0.2425	0.4287	0.2512	0.4339
Senior high school leavers	0.4881	0.5000	0.4921	0.5001
Junior college and vocational college graduates	0.0999	0.3000	0.0940	0.2920
University and graduate school graduates	0.1695	0.3753	0.1627	0.3692
Men	0.6037	0.4893	0.6026	0.4895
Component ratio of state of health				
Good	0.4454	0.4972	0.4509	0.4978
Normal	0.4418	0.4968	0.4297	0.4952
Poor	0.1128	0.3164	0.1194	0.3244
Family composition factors				
Component ratio of spouse-related status				
No spouse	0.2010	0.4009	0.2066	0.4050
Spouse/regular employee	0.1257	0.3316	0.1325	0.3391
Spouse/non-regular	0.2151	0.4110	0.2141	0.4104
Spouse/not in employment	0.4582	0.4984	0.4468	0.4973
With family nursing care	0.1619	0.3685	0.1579	0.3647
Number of cohabiting relatives	1.9404	1.4376	1.9334	1.4197
Child-related status				
Childless	0.1110	0.3143	0.1180	0.3228
Children/independent	0.6131	0.4872	0.6088	0.4882
Children/1–4 years support	0.1344	0.3412	0.1352	0.3421
Children/more than 5 years support	0.0614	0.2401	0.0577	0.2332
Prospects unknown	0.0801	0.2715	0.0803	0.2719

Table 1 (*Continued*)

	Participation in social contribution activities		Willingness to participate in social contribution activities	
	Average value	Standard deviation	Average value	Standard deviation
Other factors				
Life satisfaction	0.4459	0.4972	0.4331	0.4957
Mandatory retirement experience	0.3489	0.4768	0.3349	0.4721
Jobs-to-applicants ratio	0.4196	0.0706	0.4197	0.0704
Component ratio of urban scale				
Less than 50,000 inhabitants	0.2110	0.4081	0.2100	0.4075
50,000–99,999 inhabitants	0.2676	0.4429	0.2663	0.4422
100,000–199,999 inhabitants	0.1724	0.3779	0.1730	0.3783
200,000–499,999 inhabitants	0.2531	0.4349	0.2574	0.4373
500,000 or more inhabitants	0.0959	0.2945	0.0933	0.2910
Sample size	1711		1457	

Source: Calculated by the author from the *Survey on Hiring and Employment Status of Older Persons* conducted by JILPT in 2009.

Note: Age groups limited to the 55–69 bracket.

Fourthly, on other factors, (1) previous studies have pointed out that the likelihood of taking part in volunteer activities increases in proportion to the level of satisfaction with life. For this, a life satisfaction dummy (Satisfied/More or less satisfied = 1, otherwise = 0) was set. (2) A mandatory retirement experience dummy was set, as the mandatory retirement system could have an impact on the volunteer labor supply. (3) Socio-economic environments are thought to influence social activity by older persons. For example, Vaillancourt (1994) shows that the smaller the regional scale, the larger the volunteer labor supply tends to be. In this paper, an urban scale dummy was set to control the impact of regional scale. Levels of participation in volunteer activities are also thought to differ because the state of labor supply and demand differs from region to region. In this paper, the jobs-to-applicants ratio by age group and by prefecture has been set as a proxy indicator for labor supply and demand based on the Labour Force Survey (Ministry of Internal Affairs and Communications). The descriptive statistics of each variable are summarized in Table 1.

IV. Analysis Results

1. Analysis Results on Determining Factors behind Participation in Volunteer Activities

Table 2 (overall, by gender) and Table 3 (by age group) summarize the analysis results on the probability of participation in volunteer activities by middle-aged and older persons. First, based on the analysis results in Table 2, the various factors that influence the probability of taking part in volunteer activities by middle-aged and older persons will be

Table 2. Analysis of Determining Factors behind Participation

Explained variables	Overall		
	Estimation coefficient	z value	Marginal effect
Involved in social contribution activities = 1, otherwise = 0			
Market wage rate (estimated)	-0.490 *	-1.91	-0.076
Savings	0.011	0.32	0.003
Income of other family members	0.004 **	2.13	0.001
Age	-0.598 *	-1.84	-0.140
Square of age	0.005 *	1.89	0.001
Educational background (junior high school leavers)			
Senior high school leavers	0.270 **	2.39	0.065
Junior college and vocational college graduates	0.509 ***	3.15	0.087
University and graduate school graduates	0.544 ***	3.32	0.122
Men	0.077	0.52	
State of health (good)			
Normal	-0.086	-0.88	-0.031
Poor	-0.417 **	-2.54	-0.112
Spouse-related status (no spouse)			
Spouse/regular employee	-0.273	-1.55	-0.054
Spouse/non-regular	0.081	0.57	-0.016
Spouse/not in employment	0.148	1.20	-0.008
Number of cohabiting relatives	-0.008	-0.26	0.005
With family nursing care	0.161	1.52	0.039
Child-related status (childless)			
Children independent	0.262 *	1.61	0.053
1–4 years support	0.309 *	1.60	0.056
More than 5 years support	0.492 **	2.26	0.124
Prospects unknown	0.327	1.56	0.050
Life satisfaction	0.197 **	2.36	0.018
Mandatory retirement experience	0.131	1.32	0.053
Jobs-to-applicants ratio	0.040	0.07	0.071
Urban scale (less than 50,000 inhabitants)			
50,000–99,999 inhabitants	-0.006	-0.05	0.004
100,000–199,999 inhabitants	0.002	0.01	0.051
200,000–499,999 inhabitants	-0.066	-0.55	0.017
500,000 inhabitants or more	0.080	0.52	0.089
Constant term	19.785 *	1.85	
Sample size	1711		
Maximum likelihood probability	-633.026		
Coefficient of determination	0.055		

Source: Calculated by the author from the *Survey on Hiring and Employment Status of Older Persons*

Notes: 1. *, **, *** show significance levels of 10%, 5%, and 1%, respectively.

2. Age groups limited to the 55–69 bracket.

in Volunteer Activities by Middle-Aged and Older Persons (1)

Estimation coefficient	Men		Women		
	z value	Marginal effect	Estimation coefficient	z value	Marginal effect
-0.393	-1.17	-0.076	-0.655	-1.44	-0.126
0.016	0.35	0.003	0.023	0.40	0.004
0.007 **	2.03	0.001	0.003	0.89	4.885E-04
-0.724 *	-1.69	-0.140	-0.570	-1.06	-0.110
0.006 *	1.73	0.001	0.005	1.07	0.001
0.329 **	2.17	0.065	0.181	1.01	0.035
0.374	1.42	0.087	0.532 **	2.28	0.125
0.539 ***	2.62	0.122	0.658 *	1.94	0.172
-	-	-	-	-	-
-0.161	-1.32	-0.031	0.041	0.23	0.008
-1.013 ***	-2.98	-0.112	-0.126	-0.54	-0.023
-0.332	-1.24	-0.054	-0.267	-1.05	-0.046
-0.087	-0.40	-0.016	0.124	0.58	0.025
-0.041	-0.21	-0.008	0.319 *	1.86	0.065
0.026	0.66	0.005	-0.048	-0.98	-0.009
0.188	1.36	0.039	0.110	0.63	0.022
0.282	1.31	0.053	0.195	0.72	0.036
0.259	1.04	0.056	0.283	0.84	0.062
0.504 *	1.84	0.124	0.482	1.26	0.118
0.231	0.80	0.050	0.409	1.24	0.095
0.094	0.85	0.018	0.297 **	2.21	0.059
0.267 **	2.05	0.053	0.026	0.15	0.005
0.369	0.47	0.071	-0.429	-0.47	-0.082
0.022	0.14	0.004	-0.060	-0.34	-0.011
0.240	1.44	0.051	-0.381 **	-1.70	-0.062
0.087	0.54	0.017	-0.221	-1.16	-0.040
0.386	1.56	0.089	-0.474 *	-1.69	-0.071
22.860 *	1.62		20.711	1.15	
1033			678		
-375.383			-244.083		
0.076			0.074		

conducted by JILPT in 2009.

Table 3. Analysis of Determining Factors behind Participation

Explained variables	Ages 55–59		
	Estimation coefficient	z value	Marginal effect
Involved in social contribution activities = 1, otherwise = 0			
Market wage rate (estimated)	-0.711	-1.59	-0.114
Savings	0.031	0.50	0.005
Income of other family members	0.002	0.84	3.557E-04
Age	-4.296	-0.86	-0.689
Square of age	0.037	0.84	0.006
Educational background (junior high school leavers)			
Senior high school leavers	0.337	1.22	0.054
Junior college and vocational college graduates	1.116 ***	3.35	0.284
University and graduate school graduates	0.880 **	2.41	0.192
Men	0.386	1.33	0.059
State of health (good)			
Normal	0.074	0.43	0.012
Poor	0.333	0.71	0.066
Spouse-related status (no spouse)			
Spouse/regular employee	-0.463 *	-1.74	-0.063
Spouse/non-regular	-0.313	-1.23	-0.046
Spouse/not in employment	-0.112	-0.47	-0.017
Number of cohabiting relatives	0.011	0.20	0.002
With family nursing care	0.301 *	1.69	0.055
Child-related status (childless)			
Children independent	-0.006	-0.02	-0.001
1–4 years support	0.013	0.04	0.002
More than 5 years support	0.096	0.29	0.016
Prospects unknown	0.229	0.62	0.042
Life satisfaction	0.185	1.22	0.030
Mandatory retirement experience	-0.302	-0.54	-0.040
Jobs-to-applicants ratio	1.216	1.16	0.195
Urban scale (less than 50,000 inhabitants)			
50,000–99,999 inhabitants	0.084	0.38	0.014
100,000–199,999 inhabitants	-0.021	-0.09	-0.003
200,000–499,999 inhabitants	0.031	0.14	0.005
500,000 inhabitants or more	0.522	1.67	0.110
Constant term	128.272	0.90	
Sample size	612		
Maximum likelihood probability	-190.547		
Coefficient of determination	0.090		

Source: Calculated by the author from the *Survey on Hiring and Employment Status of Older Persons*

Notes: 1. *, **, *** show significance levels of 10%, 5%, and 1%, respectively.

2. Age groups limited to the 55–69 bracket.

in Volunteer Activities by Middle-Aged and Older Persons (2)

Ages 60–64			Ages 65–69		
Estimation coefficient	z value	Marginal effect	Estimation coefficient	z value	Marginal effect
-0.229	-0.49	-0.035	-1.015 *	-1.66	-0.244
0.038	0.65	0.006	-0.013	-0.18	-0.003
-0.001	-0.18	-1.495E-04	0.014 ***	2.74	0.003
6.427	1.16	0.983	-1.440	-0.25	-0.346
-0.052	-1.15	-0.008	0.010	0.25	0.002
0.677 ***	2.87	0.106	0.107	0.61	0.026
0.565 *	1.74	0.115	-0.258	-0.69	-0.055
0.551 *	1.68	0.109	0.574 **	2.17	0.166
-0.087	-0.32	-0.014	0.162	0.54	0.038
-0.173	-0.99	-0.026	-0.228	-1.21	-0.056
-0.830 **	-2.10	-0.079	-0.449 *	-1.80	-0.096
-0.131	-0.36	-0.019	0.130	0.25	0.033
0.453 *	1.62	0.082	0.127	0.47	0.032
0.445 *	1.75	0.070	0.097	0.48	0.023
-0.003	-0.05	-4.848E-04	-0.023	-0.46	-0.006
0.103	0.53	0.016	-0.001	0.00	-2.213E-04
0.867 **	1.97	0.117	0.253	0.90	0.057
0.996 **	2.08	0.240	0.132	0.33	0.033
1.168 **	2.10	0.321	0.811 *	1.88	0.261
0.987 **	1.98	0.243	0.210	0.58	0.055
0.348 **	2.23	0.055	0.054	0.37	0.013
-0.012	-0.07	-0.002	0.303 **	1.98	0.071
-1.479	-1.30	-0.226	0.841	0.81	0.202
0.084	0.40	0.013	-0.020	-0.10	-0.005
-0.087	-0.35	-0.013	0.149	0.68	0.037
-0.103	-0.47	-0.015	-0.204	-0.97	-0.046
-0.307	-1.00	-0.040	0.107	0.39	0.027
-200.895	-1.17		55.001	0.29	
580			519		
-186.774			-222.898		
0.117			0.081		

conducted by JILPT in 2009.

studied.

Firstly, on income factors, (1) although the statistically significant level is 10%, the probability of participation tends to be 7.6 percentage points lower for every 1 unit increase in the logarithm of the market wage rate. In other words, the higher the market wage rate, the lower the likelihood of taking part in volunteer activities. Freeman (1997), Atoda and Fukushige (2000) produced similar results, suggesting a trade-off relationship between market labor and volunteer activities. The following may be posited regarding the analysis results on wage rates. According to the subjective equilibrium model for labor supply, the higher the wage rate, the shorter the working hours and the longer the leisure time, due to the income effect. According to the substitution effect, on the other hand, working hours would be longer and leisure time shorter. The impact of the wage rate on volunteer activities results from this kind of trade-off between the income effect and the substitution effect. When the substitution effect is greater than the income effect, this is thought to be reflected in the result that older persons are less likely to take part in volunteer activities if the wage rate is higher. Estimates based on gender do not seem to be affected by the wage rate, however.

In the estimates by gender, the probability of men being involved in volunteer activities tends to increase in proportion to the income of other family members. Among women, conversely, no statistically significant variable is seen. The impact of non-earned income on volunteer activities is larger among men, showing a clear bias based on gender. The main reason for this may lie in the fact that, in Japan, more people perceive a gender-based division of labor roles, to the effect that that “men work, women stay at home.” The result of this gender-based role division is thought to be that, if non-earned income is not a significant part of the household budget, men have no option but to concentrate on market labor, and this reduces their likelihood of being involved in volunteer activities.

(2) The probability of taking part in volunteer activities tends to rise in proportion to the income of other family members, that is similar to that of Menchik and Weisbrod (1987). However, while the impact of non-earned income is statistically notable, its effect is not great. For example, the estimation results have made it clear that, even if the income of other family members were to increase by 1 million yen, the probability of taking part in volunteer activities would only increase by a mere 0.1 percentage point.

Secondly, on individual attribute factors, (1) although the statistically significant level is 10%, the first order of age produced a negative value but the second was positive. As a result of calculation using the average values for each factor based on the analysis results, we know that the probability of participation falls from 12.67% at age 55 to 10.66% at age 60, then climbs again to 14.93% at age 65 and further to 19.35% at age 69. In other words, age and the probability of taking part in volunteer activities appear to be in a U-shaped relationship among middle-aged and older persons. Because the distribution ratio of mandatory

retirement age in Japanese companies is mostly between 60 and 65,⁹ the probability of taking part in volunteer activities is thought to increase from age 61 onwards. This trend is reflected in that, in the estimates by gender, the same U-shaped relationship is only found among men. This shows that, for men, the timing of mandatory retirement is a key point that influences the probability of taking part in volunteer activities.

The analysis results related to age in this paper are contrary to those of Menchik and Weisbrod (1987). This is probably because the age groups targeted by the analysis are different. To examine the effect of age in more detail, an analysis aimed at all age groups will need to be made in future.

(2) On the impact of educational background, the probability of taking part in volunteer activities is 6.5 percentage points higher among senior high school group, 8.7 percentage points higher among junior college and vocational college groups, and 12.2 percentage points higher among university and graduate school groups, compared to junior high school group. This confirms that, in middle-aged and older persons, the probability of taking part in volunteer activities increases in proportion to the final educational level. The probability of taking part in volunteer activities is higher in the medium and higher educational background groups compared to the lower educational background group (junior high school group) for both men and women, although this impact of educational background was relatively larger among the latter.

Because the wage rate is controlled here, the analysis results of educational background are thought to reflect educational background effects other than market wage. That is, there would appear to be differences between educational backgrounds in awareness and behavior related to volunteer activities.

(3) The male dummy estimation is not statistically significant, and is not consistent with the conclusions of previous studies. Compared to other age groups, there are relatively more mandatory retirees (persons not in employment) among middle-aged and older persons, with little gender bias in time constraints. This is thought to explain why there is no pronounced differential between men and women in decision-making on the volunteer labor supply.

(4) Compared to respondents with good health, the probability of taking part in volunteer activities is 11.2 percentage points lower among those with poor health. This also highlights the fact that health influences decisions on taking part in volunteer activities among older persons. In terms of the estimates by gender, the probability of taking part in volunteer activities is 11.2 percentage points lower in men with poor health than in those with good health. Among women, conversely, the impact of health is not statistically significant. State of health has a larger impact among men.

Thirdly, on family composition factors, the probability of taking part in volunteer ac-

⁹ According to the Survey on Employment and Hiring and of Older Persons conducted by JILPT in 2008, the distribution ratio of mandatory retirement ages in Japanese companies was 86.9% at age 60, 0.8% at 61, 1.6% at 62, 2.2% at 63, 0.3% at 64, and 10.5% at 65.

tivities is 5.3 percentage points, 5.6 percentage points and 12.4 percentage points higher, respectively, in the children independent group, 1–4 years support group, and more than 5 years support group, in terms of overall estimation, compared to the childless group.

In terms of the estimation by gender, (1) among women, the probability of taking part in volunteer activities tends to be 6.5 percentage points higher when there is a spouse who is not in employment, compared to cases with no spouse. Among men, conversely, the spouse-related status does not markedly influence the probability of participation. (2) Among men, the probability of participation is 5.0 percentage points higher among those with children needing at least 5 years of support than in those without children. By contrast, the child-related status does not have a statistically significant impact on the probability of participation by women.

Fourthly, as the overall estimation concerning the other factors, (1) the probability of participation tends to rise in direct proportion to the level of life satisfaction. In the case of women, the probability of participation is 5.9 percentage points higher in groups with high levels of life satisfaction. Among men, on the other hand, life satisfaction has no statistically significant impact, revealing a gender differential in the impact of life satisfaction.

(2) Among men, the likelihood of taking part in volunteer activities is 5.3 percentage points higher among those who had experienced mandatory retirement compared to those who had not. Among women, on the other hand, this has no significant impact on the probability of participation. Since the majority of males concentrate solely on employment until mandatory retirement, mandatory retirement is a major life event for them, and is thought to provide the impetus for shifting from employment to volunteer activities.

(3) Among women, the probability of taking part in volunteer activities appears to be lower when the urban scale is greater, a result similar to that found by Vaillancourt (1994). According to the analysis results, the probability of participation is 6.2 percentage points and 7.1 percentage points lower, respectively, in groups living in cities with 100,000–200,000 inhabitants and those with upwards of 500,000 inhabitants, compared to groups living in cities with less than 50,000 inhabitants. In other words, the proportion of people with community awareness (or people who place value on social capital) would appear to rise in inverse proportion to urban scale. It is surmised that women shoulder the largest burden of community activity.

Finally, the analysis results by age group will be compared (see Table 3).

Firstly, on income factors, the probability of taking part in volunteer activities in the 65–69 age group tends to increase in proportion to the income of other family members, and in inverse proportion to the market wage rate. Conversely, in the 55–59 and 60–64 age groups, the estimated values for neither the market wage rate nor non-earned income are statistically significant. The reason why a difference between age groups exists in the impact of market wage rate and non-earned income could be because the 65–69 age group has a larger ratio of persons not in employment than the 55–59 and 60–64 age groups. Moreover, time constraints are smaller than in the 55–59 and 60–64 age groups, where there are large

time constraints due to employment, with less freedom for making choices not related to work. When deciding whether or not to take part in volunteer activities, the impact of economic factors such as market wage rate and non-earned income appears to play a larger role in this age group.

Secondly, on individual attribute factors, (1) on the impact of educational background, the probability of participation is higher in all ages for groups from a higher educational background than for junior high school leavers.

(2) The impact of health is greater in the 60s age groups than in the 50s age group. For example, the probability of taking part in volunteer activities is 7.9 percentage points lower (age 60–64) and 9.6 percentage points lower (ages 65–69) in the poor health group than in the good health group. In the 55–59 age group, however, the state of health does not significantly impact the probability of participation.

Thirdly, on family composition factors, (1) the impact of the spouse-related status is seen in the 55–59 and 60–64 age groups. In the 55–59 age group, for example, the probability of participation is 6.3 percentage points lower when the spouse is a regular employee group compared to the no spouse group, while the probability of participation is 5.5 percentage points higher in the group where family nursing care is required. In the 60–64 age group, meanwhile, the probability of participation is 8.2 percentage points and 7.0 percentage points higher, respectively, in the spouse non-regular employee group and the spouse not in employment group, compared to the no spouse group.

(2) In the 60–64 age group, the child-related status has the biggest impact. In the 60–64 age group, the probability of taking part in volunteer activities is 11.7 percentage points higher (children independent), 24.0 percentage points higher (1–4 years support), 32.1 percentage points higher (more than 5 years support), and 24.3 percentage points higher (prospects unknown), respectively, compared to the childless group. In the 55–59 age group, estimation results concerning the child-related status are not statistically significant.

Fourthly, as for other factors, (1) the impact of life satisfaction is larger in the 60–64 age group. In the 55–59 and 65–69 age groups, life satisfaction does not significantly impact the probability of participation, but in the 60–64 age group, it was confirmed that the probability of participation is higher for those with higher levels of life satisfaction.

(2) The impact of mandatory retirement experience is seen in the 65–69 age group. In this age group, it is suggested that mandatory retirement provided some people with the impetus for taking part in volunteer activities.

Table 2 Determining factors behind participation in social contribution activities and willingness to participate (1)

2. Analysis Results on Determining Factors behind Willingness to Participate in Volunteer Activities

Table 4 (overall, by gender) and Table 5 (by age group) summarize analysis results concerning factors that influence the probability that people not currently involved in

Table 4. Determining Factors behind Willingness to Participate

Explained variables	Overall		
	Estimation coefficient	z value	Marginal effect
Want to be involved in social contribution activities = 1, Do not want to be involved = 0			
Market wage rate (estimated)	-0.086	-0.38	-0.032
Savings	0.065 *	1.78	0.024
Income of other family members	0.006 **	2.25	0.002
Age	-0.067	-0.23	-0.025
Square of age	4.245E-04	0.18	1.559E-04
Educational background (junior high school leavers)			
Senior high school leavers	0.287 ***	2.96	0.105
Junior college and vocational college graduates	0.476 ***	3.24	0.184
University and graduate school graduates	0.572 ***	3.79	0.220
Men	-0.085	-0.65	-0.031
State of health (good)			
Normal	-0.131	-1.56	-0.048
Poor	-0.790 ***	-5.43	-0.242
Spouse-related status (no spouse)			
Spouse/regular employee	-0.413 ***	-2.89	-0.140
Spouse/non-regular	-0.120	-0.98	-0.043
Spouse/not in employment	0.012	0.11	0.004
Number of cohabiting relatives	-0.031	-1.13	-0.012
With family nursing care	-0.007	-0.07	-0.003
Child-related status (childless)			
Children independent	0.179	1.43	0.065
1–4 years support	0.105	0.68	0.039
More than 5 years support	0.430 **	2.30	0.166
Prospects unknown	0.190	1.10	0.072
Life satisfaction	0.067	0.89	0.025
Mandatory retirement experience	-0.001	-0.01	-2.422E-04
Jobs-to-applicants ratio	-0.221	-0.43	-0.081
Urban scale (less than 50,000 inhabitants)			
50,000–99,999 inhabitants	-0.139	-1.36	-0.050
100,000–199,999 inhabitants	-0.056	-0.49	-0.020
200,000–499,999 inhabitants	0.018	0.17	0.007
500,000 inhabitants or more	-0.068	-0.48	-0.025
Constant term	2.641	0.28	
Sample size	1457		
Maximum likelihood probability	-889.550		
Coefficient of determination	0.060		

Source: Calculated by the author from the *Survey on Hiring and Employment Status of Older Persons*

Notes: 1. *, **, *** show significance levels of 10%, 5%, and 1%, respectively.

2. Age groups limited to the 55–69 bracket.

in Volunteer Activities by Middle-Aged and Older Persons (1)

Men			Women		
Estimation coefficient	z value	Marginal effect	Estimation coefficient	z value	Marginal effect
0.051	0.17	0.019	-0.437	-1.16	-0.159
0.070	1.53	0.026	0.062	1.00	0.023
0.005	1.33	0.002	0.008 **	2.10	0.003
-0.110	-0.29	-0.041	0.002	0.00	0.001
0.001	0.27	2.978E-04	-1.465E-04	-0.04	-5.330E-05
0.342 ***	2.68	0.126	0.221	1.42	0.080
0.165	0.72	0.062	0.691 ***	3.28	0.266
0.510 ***	2.78	0.195	0.840 **	2.51	0.325
-	-	-	-	-	-
-0.116	-1.08	-0.042	-0.204	-1.41	-0.074
-0.691 ***	-3.12	-0.214	-0.853 ***	-4.08	-0.264
-0.249	-1.11	-0.088	-0.463 **	-2.35	-0.156
0.006	0.03	0.002	-0.137	-0.75	-0.049
0.265	1.58	0.097	-0.268 *	-1.74	-0.095
-0.040	-1.07	-0.015	-0.021	-0.50	-0.008
-0.061	-0.48	-0.022	0.045	0.29	0.017
0.212	1.28	0.078	0.041	0.20	0.015
0.136	0.69	0.051	-0.110	-0.40	-0.039
0.474 **	2.00	0.184	0.241	0.73	0.091
0.132	0.56	0.050	0.156	0.58	0.058
0.042	0.43	0.016	0.109	0.90	0.040
-0.103	-0.91	-0.038	0.122	0.81	0.045
-0.365	-0.53	-0.134	-0.185	-0.23	-0.067
-0.084	-0.63	-0.031	-0.244	-1.46	-0.086
-0.117	-0.80	-0.042	-0.005	-0.03	-0.002
0.084	0.63	0.031	-0.082	-0.47	-0.029
0.001	0.00	2.708E-04	-0.145	-0.63	-0.051
2.619	0.21		3.169	0.20	
878			579		
-537.083			-340.939		
0.061			0.088		

conducted by JILPT in 2009.

Table 5. Determining Factors behind Willingness to Participate

Explained variables	Ages 55–59		
	Estimation coefficient	z value	Marginal effect
Want to be involved in social contribution activities = 1, Do not want to be involved = 0			
Market wage rate (estimated)	0.300	0.83	0.114
Savings	0.194 ***	2.58	0.074
Income of other family members	0.003	0.82	0.001
Age	-0.116	-0.03	-0.044
Square of age	4.772E-04	0.01	1.819E-04
Educational background (junior high school leavers)			
Senior high school leavers	0.120	0.64	0.046
Junior college and vocational college graduates	0.214	0.81	0.083
University and graduate school graduates	0.273	0.97	0.106
Men	-0.210	-0.93	-0.081
State of health (good)			
Normal	-0.073	-0.54	-0.028
Poor	-0.179	-0.41	-0.066
Spouse-related status (no spouse)			
Spouse/regular employee	-0.351 *	-1.65	-0.129
Spouse/non-regular	-0.069	-0.34	-0.026
Spouse/not in employment	0.218	1.12	0.084
Number of cohabiting relatives	-0.020	-0.43	-0.008
With family nursing care	-0.024	-0.15	-0.009
Child-related status (childless)			
Children independent	0.223	1.06	0.085
1–4 years support	-0.084	-0.35	-0.032
More than 5 years support	0.304	1.13	0.119
Prospects unknown	0.300	1.00	0.117
Life satisfaction	-0.073	-0.60	-0.028
Mandatory retirement experience	-0.517	-1.19	-0.176
Jobs-to-applicants ratio	-1.492 *	-1.71	-0.569
Urban scale (less than 50,000 inhabitants)			
50,000–99,999 inhabitants	0.205	1.16	0.079
100,000–199,999 inhabitants	0.172	0.93	0.066
200,000–499,999 inhabitants	0.159	0.89	0.061
500,000 inhabitants or more	0.239	0.95	0.093
Constant term	2.871	0.03	
Sample size	540		
Maximum likelihood probability	-339.181		
Coefficient of determination	0.058		

Source: Calculated by the author from the Survey on Hiring and Employment Status of Older Persons

Notes: 1. *, **, *** show significance levels of 10%, 5%, and 1%, respectively.

2. Age groups limited to the 55–69 bracket.

in Volunteer Activities by Middle-Aged and Older Persons (2)

Ages 60–64			Ages 65–69		
Estimation coefficient	z value	Marginal effect	Estimation coefficient	z value	Marginal effect
-0.053	-0.14	-0.020	-0.946	-1.52	-0.309
0.032	0.59	0.012	-0.047	-0.63	-0.015
0.007	1.54	0.003	0.010 *	1.87	0.003
-5.048	-1.12	-1.874	1.933	0.33	0.630
0.041	1.13	0.015	-0.015	-0.34	-0.005
0.332 **	2.03	0.123	0.476 ***	2.58	0.156
0.587 **	2.42	0.228	0.826 ***	2.61	0.310
0.753 ***	2.95	0.292	0.661 **	2.29	0.242
-0.106	-0.48	-0.039	0.218	0.73	0.070
-0.133	-0.95	-0.049	-0.304	-1.54	-0.100
-0.616 **	-2.53	-0.200	-1.048 ***	-4.07	-0.284
-0.608 **	-2.42	-0.199	0.243	0.50	0.085
-0.323	-1.57	-0.115	0.366	1.30	0.129
-0.138	-0.77	-0.051	0.082	0.40	0.026
-0.031	-0.60	-0.011	-0.044	-0.83	-0.014
-0.008	-0.05	-0.003	0.016	0.07	0.005
0.238	1.16	0.087	0.076	0.28	0.025
0.282	1.05	0.108	0.557	1.42	0.204
0.768 **	2.05	0.299	0.556	1.14	0.204
0.034	0.12	0.013	0.142	0.40	0.048
0.121	0.92	0.045	0.212	1.35	0.070
-0.034	-0.26	-0.012	0.057	0.38	0.019
0.457	0.52	0.170	-0.110	-0.10	-0.036
-0.133	-0.74	-0.049	-0.578 ***	-2.88	-0.171
0.110	0.55	0.041	-0.590 **	-2.38	-0.165
-0.001	-0.01	0.000	-0.038	-0.19	-0.012
-0.059	-0.26	-0.022	-0.354	-1.24	-0.104
155.295	1.11		-57.681	-0.30	
500			417		
-303.500			-218.501		
0.074			0.139		

conducted by JILPT in 2009.

volunteer activities will want to do so in future (hereinafter “the probability of willingness to participate”).

First, the analysis results will be studied using overall and gender-specific samples (see Table 4).

Firstly, on income factors, the overall analysis shows that the likelihood of wanting to be involved in volunteer activities tends to be higher when savings and the income of other family members are higher. For example, for every 1 million yen increase in non-earned income, the probability of willingness to participate in volunteer activities is 2.4 percentage points higher (savings) and 0.2 percentage point higher (family income), respectively. By gender, the probability of women wanting to be involved in volunteer activities increases in direct proportion to the income of other family members. Among men, on the other hand, none of the estimated values for non-earned income are statistically significant.

Secondly, on individual attribute factors, (1) no significant impact of age on the probability of willingness to participate could be confirmed, from either the overall or the gender-specific analysis.

(2) On the impact of educational background, the probability of willingness to participate in volunteer activities is higher among senior high school group (10.5 percentage points), junior college and vocational college group (18.4 percentage points) and university and graduate school groups (22.0 percentage points) than among junior high school group. For both men and women, moreover, the probability of wanting to be involved in volunteer activities is higher in groups with a higher educational level than among junior high school leavers, while the impact of educational background appears to be relatively larger among women.

(3) Compared to respondents in good health, the probability of willingness to participate in volunteer activities by those in poor health is 24.2 percentage points lower. By gender, the probability of willingness to participate by those in poor health is 21.4 percentage points lower (men) and 26.4 percentage points lower (women) than by those in good health.

Thirdly, on family composition factors, (1) the probability of willingness to participate is 14.0 percentage points lower overall when the spouse is a regular employee compared to the no spouse group. The same trend is seen for women but not for men. (2) The probability of willingness to participate in volunteer activities is 16.6 percentage points higher in the more than 5 years support group compared to the childless group. The same trend is seen among men but not among women.

Finally, the analysis results by age group will be compared (see Table 5).

Firstly, on income factors, the probability of willingness to participate among the 55–59 age group increases by 7.4 percentage points for every 1 million yen increase in savings. In the 65–69 age group, the probability of willingness to participate increases by 0.3 percentage point for every 1 million yen increase in the income of other family members. In the 60–64 age group, by contrast, savings and the income of other family members do not have a statistically significant impact on the probability of willingness to participate. In this

group, no impact of income factors can be seen on the probability of participation, either. It may be that, in this generation, factors that encourage volunteer activities can be found outside the scope of economic grounds.

Secondly, on individual attribute factors, (1) the probability of willingness to participate tends to be higher in the 60–64 and 65–69 age groups if the educational background is higher. In the 55–59 age group, conversely, educational background does not significantly impact the probability of willingness to participate.

(2) The state of health is seen to have an impact in the 60s age groups. For example, the probability of taking part in volunteer activities by those in poor health is 20.0 percentage points lower (ages 60–64) and 28.4 percentage points lower (ages 65–69) than by those in good health. In the 55–59 age group, conversely, the state of health does not have a significant impact on the probability of participation.

Thirdly, on family composition factors, (1) the impact of the spouse-related status is larger in the 55–59 and 60–64 age groups. For example, compared to the no spouse group, the probability of participation is 12.9 percentage points lower (55–59) and 19.9 percentage points lower (60–64) in the spouse regular employee group. In the 65–69 age group, conversely, the impact of the spouse-related status on the probability of willingness to participate is not statistically significant. (2) In the 60–64 age group, compared to the childless group, the probability of willingness to participate is 29.9 percentage points higher in the more than 5 years support group. On the other hand, in both the 55–59 and 65–69 age groups, estimation results on the child-related status are not statistically significant.

Fourthly, on other factors, (1) the impact of labor supply and demand is greatest in the 55–59 age group, where the probability of willingness to participate in volunteering decreases as the jobs-to-applicants ratio rises (the local labor demand rises). On the other hand, the impact of the jobs-to-applicants ratio is not statistically significant in the 60s age groups. (2) In the 65–69 age group, compared to groups living in small-scale cities (cities with less than 50,000 inhabitants), the probability of willingness to participate is 17.1 points lower (50,000–99,999 inhabitants) and 16.5 percentage points lower (100,000–199,999 inhabitants) for groups living in medium- to large-scale cities. In the 55–59 and 60–64 age groups, on the other hand, there is no pronounced bias in the probability of willingness to participate depending on urban scale.

V. Conclusions

This paper uses microdata from the JILPT Survey on Hiring and Employment Status of Older persons (2009) to analyze respondents in the 55–69 age bracket, and conducts empirical research on the factors that influence participation in volunteer activities and willingness to participate. The main conclusions are as follows.

Firstly, the determining factors behind participation in volunteer activities were examined. (1) As income factors, the likelihood of taking part in social contribution activities

tends to decrease as the market wage rate rises. Market labor and volunteer activities are in a trade-off relationship. Conversely, although the probability of taking part in volunteer activities tends to increase as the income of other family members rises, the effects of this are not so great. (2) As for individual attribute factors, the probability of participation by middle-aged and older persons tends to decrease as age rises from 55 to 60, reaching its lowest level in the age 60 group. By contrast, the probability of participation tends to increase between the ages of 61 and 69. In other words, age and the probability of taking part in volunteer activities are in a U-shaped relationship among middle-aged and older persons. The higher the final educational level, the higher the probability of taking part in volunteer activities. There is little gender differential in the volunteer labor supply from middle-aged and older persons. And the probability of taking part in volunteer activities is lower among those in poor health than those in good health. (3) On family composition factors, the probability of taking part in volunteer activities is higher in groups with children compared to those without. (4) The probability of participation tends to be in direct proportion to the level of life satisfaction.

Secondly, determining factors behind willingness to participate in volunteer activities were examined. (1) As income factors, the likelihood of wanting to be involved in volunteer activities tends to be in direct proportion to savings and the income of other family members. (2) As regards individual attribute factors, the likelihood of wanting to be involved in volunteer activities is higher among those from a higher educational level and those in good health. (3) On family composition factors, the probability of willingness to participate in volunteer activities is higher among respondents with children requiring more than 5 years of support, compared to the childless group.

Thirdly, in these determining factors behind participation in volunteer activities and willingness to participate, the impact of each factor differs according to gender and age groups. For example, the impact of non-earned income and other economic factors on participation in volunteer activities is larger among men than among women, and larger in the 65–69 age group than in the 55–59 and 60–64 age groups. On the other hand, the impact of non-earned income and other economic factors on future willingness to participate in volunteer activities is larger among women than among men, and larger in the 55–59 and 65–69 age groups than in the 60–64 age group.

These results of empirical analysis are thought to have the following policy implications.

Firstly, overall, the probability of middle-aged and older persons taking part in volunteer activities tends to be lower if the market wage is higher, suggesting a trade-off relationship between market labor and volunteer activities. In this sense, promoting the continued employment of older persons could lead to a decrease in the volunteer labor supply. One reason for this is the fact that, even among older persons, working full-time is common practice, and there is a trade-off relationship between working hours and leisure time (volunteer activities). That is to say, hours of volunteer labor supply are thought to decrease as

working hours lengthen. Of course, this could be said not only for older persons but also for all workers in general. Nevertheless, to promote participation in volunteer activities, we will need to consider introducing flexible systems of managing working hours (for example, short hour working systems or flextime systems), or revising excessive overtime work.

Secondly, it has been shown that age and the probability of taking part in volunteer activities are in a U-shaped relationship among middle-aged and older persons, and that, from the age of 61, the probability of participation tends to increase with age. Among men, in particular, mandatory retirement appears to trigger an increased likelihood of taking part in volunteer activities. To promote volunteer activities by middle-aged and older persons, therefore, we will need to encourage participation in volunteer activities among people in their 50s (i.e. before the age of mandatory retirement) or to offer trials, etc., anticipating the timing of mandatory retirement and subsequent lifestyles. However, a gender and age differentials are observed both in the probability of taking part in volunteer activities and the probability of willingness to participate. As such, we will need to find different methods of promotion suited to each particular group. Why this kind of differential exists in middle-aged and older persons is seen as an issue for further analysis in future.

Finally, issues not treated by this paper should be pointed out. Firstly, this paper has given an empirical analysis of determining factors behind the volunteer labor supply among older persons, using cross-section data from a specific point in time. Although this has produced new knowledge, problems of heterogeneity between individuals could remain in the analysis results. Analysis using panel data related to this issue should be made in future. Moreover, we will also need to conduct detailed analysis on factors on the volunteer demand side, as well as regional differentials in the volunteer labor supply.

Appendix Table. Estimation Results of Wage Function in Older Persons

	Heckman's two-step estimation method				OLS	
	2nd step estimation (wage function)		1st step estimation (employment selection function)		(wage function)	
	Estimation coefficient	z value	Estimation coefficient	z value	Estimation coefficient	z value
Men	0.356 ***	7.09	0.076	0.72	0.357 ***	7.08
Years of experience	-0.124 **	-1.86	-0.091	-0.72	-0.141 **	-2.10
Square of years of experience	0.001	1.46	3.20E-04	0.25	0.001	1.55
Educational background (junior high school leavers)						
Senior high school leavers	-0.023	-0.36	-0.228 *	-1.86	-0.067	-1.08
Junior college and vocational college graduates	-0.143	-1.55	-0.159	-0.85	-0.189 **	-2.08
University and graduate school graduates	-0.075	-0.68	-0.736 ***	-3.76	-0.208 **	-2.02
State of health (good)						
Normal	0.117 **	2.31	-0.337 ***	-3.88	0.077	1.57
Poor	0.362 **	2.25	-1.281 ***	-7.51	0.134	0.91
With family nursing care			-0.222 **	-2.18		
Eligible for pension			0.149	1.54		
Number of family members			-0.032	-1.17		
Savings			3.52E-12	0.42		
Income of other family members			-0.006 ***	-3.47		
Mandatory retirement experience			-0.043	-0.42		
Experience of occupation change			-1.218 ***	-12.53		
Regular employee	0.406 ***	8.14			0.422 ***	8.30
Occupation at age 55 (Clerical workers)						
Specialist and technical	0.019	0.28	0.025	0.19	0.018	0.26
Administrative and managerial workers	0.068	0.80	0.001	0.01	0.027	0.32
Sales workers	-0.263 ***	-3.14	0.601 ***	3.79	-0.280 ***	-3.35
Service workers	-0.189 **	-2.35	0.673 ***	4.31	-0.206 **	-2.56
Security, transport and communication workers	-0.185 **	-2.36	-0.087	-0.58	-0.187 **	-2.38
Workers not classifiable by occupation	-0.280 ***	-3.32	0.105	0.62	-0.276 ***	-3.27
Corporate scale at age 55 (99 employees or less)						
100–999 employees	0.129 **	2.56	0.215 **	2.20		
1,000 employees or more	0.403 ***	7.54	0.197 *	1.91	0.149 ***	2.98
Public offices	0.415 ***	4.98	-0.273 *	-1.89	0.414 ***	7.75
Regular employees at age 55			-0.071	-0.68	0.374 ***	4.52
Jobs-to-applicants ratio			-0.631	-0.88		

Appendix Table (Continued)

	Heckman's two-step estimation method					
	2nd step estimation (wage function)		1st step estimation (employment selection function)		OLS (wage function)	
	Estimation coefficient	z value	Estimation coefficient	z value	Estimation coefficient	z value
Regional blocks (Minami-Kanto)						
Hokkaido	-0.310 ***	-2.58	-0.562 ***	-2.61	-0.352 ***	-2.92
Tohoku	-0.092	-1.11	-0.173	-1.00	-0.101	-1.21
Kita-Kanto, Koshin	-0.189 **	-2.38	0.019	0.12	-0.179 **	-2.25
Hokuriku	-0.150	-1.58	0.126	0.70	-0.137	-1.45
Tokai	-0.083	-1.24	0.303 **	2.29	-0.065	-0.96
Kinki	-0.031	-0.47	-0.007	-0.05	-0.032	-0.48
Chugoku, Shikoku	-0.123 *	-1.68	0.033	0.22	-0.128 *	-1.74
Kyushu, Okinawa	-0.094	-1.23	-0.177	-1.20	-0.112	-1.48
Constant term	10.718 ***	6.53	5.306 *	1.68	11.296 ***	6.90
Inverse Mills ratio	-0.235 ***	-3.08				
Sample size	1521				830	
Censoring sample	691					
Non-censoring sample	830					
Freedom corrected coefficient of determination					0.394	

Source: Calculated by the author from the *Survey on Hiring and Employment Status of Older Persons* conducted by JILPT in 2009.

Notes: 1. *, **, *** show significance levels of 10%, 5%, and 1%, respectively.

2. Age groups limited to the 55–69 bracket.

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