Chapter 6

Gender Gap in Volunteer Activity Participation

Abstract Using the longitudinal data of the China Health and Retirement Longitudinal Survey (CHARLS) from 2011 to 2015, this study investigates the determinants of participation in volunteer activity of individuals aged 45–69 in China; it also compares differences in the determinants by gender. The random effects model and instrumental variables method are used to address unobserved heterogeneity and other endogeneity problems. The results indicate that when other factors are held constant, the gender gap in the probability of participating in volunteer activity is smaller. Second, to compare differences in the mechanisms for participating in volunteer activity by gender, we found that six factors (market work, education, income, family care, age, health status) are broadly supported for women and men, but the influence of determinant factors is different by gender.

Keywords Gender gap · Volunteer activity · Participation · China

6.1 Introduction

Research suggests that, in many developed countries, volunteer activity¹ is an important part of social life, and volunteer activity improves individuals' well-being (happiness or health status) and increases social capital and community development (Growiec and Growiec 2014; Rodriguez-Pose and Berlepsch 2014; Aranpatzi et al. 2018; Ma et al. 2020; Ma 2020). Some previous studies have analyzed the determinants of participation in volunteer activity in developed countries and analyzed nonprofit organizations in China (McCabe and Deng 2018; Pei et al. 2018; Liu and Dong 2018; Dong et al. 2019; Li 2019; Liu and Wang 2019). Yet empirical studies of individuals' behavior in participating in volunteer activity for China using national longitudinal survey data are limited, and the studies on the gender gap in volunteer activity participation are scarce. This study can fill the gaps.

Volunteering may be a beneficial activity for older adults. It gives them a connection to people, a usefulness to others they may value, and a purpose in life that may improve their self-esteem and mental and physical health. Notably, in China, the mandatory retirement age for men is 60 for both worker (blue collar worker) and cadre (white collar worker); For women, it is 50 (for a worker) and 55 (for a cadre).

Retired people usually have more disposable time than workers, it can be expected that the probability of participating in volunteer activity may be higher for retired individuals than for working individuals. The issue becomes even more relevant because China is experiencing the quick population aging. Using a national longitudinal survey, this study investigates the determinants of participation in volunteer activity of individuals aged 45–69 years old in China and compares the results by gender.

The remainder of this chapter is as follows. Section 6.2 summarizes the previous empirical studies on the issue and discusses the influences of main factors on participation in volunteer activity. Section 6.3 gives the framework of the empirical analysis, including models and datasets. Section 6.4 introduces the empirical results and compares them by gender. Section 6.5 summarizes the conclusions.

6.2 Literature Review

6.2.1 *Theories and Empirical Studies on the Determinants of Participation in Volunteer Activity*

Theoretical frameworks² on the determinants of participation in volunteer activities can be summarized from three perspectives: (i) psychological theories that emphasize personality traits, self-concepts, and motivations (Handy and Cnaan 2007; Einolf 2008; Gronlund 2011); (ii) sociological theories that focus on individual sociodemographic characteristics such as race, gender, social class, and social network (or social capital); and (iii) economics theories based on the altruistic behavior of “not for oneself but for someone else” (Becker 1974, 1976, 1981, 1991, 1985a, 1985b; Barro 1974; Andreoni 1989, 1990; Sen 1982; Haski-Leventhal 2009), and those based on selfish behavior. The consumption model is based on a utility function, in which volunteer activities are treated as a consumer good that is similar to leisure in neoclassic economics (Menchik and Weisbrod 1987; Freeman 1997; Yamauchi 2001).

This study is mainly based on the economics theories. Previous studies³ of developed countries have shown that volunteer participation is influenced by work status, educational background, household income, family care, age, health status, and other factors (i.e., gender, community).

However, empirical studies on the issue for China are scarce; three papers deal with the issue. Concretely, using a cross-sectional community survey conducted in 2008 in Shanghai, Tong et al. (2018) examined the probability of participation into formal social participation among elderly single-person household and the association between the utilization of community-based services and formal social participation. They found that the use of community-based services is significantly associated with formal social participation among elderly single-person household. The results also indicate that the age and number of chronic illnesses may negatively

affect the probability of participation into social activity. Using data from the 2012 Chinese General Social Survey (CGSS), Lin (2019) investigated the impact of social capital (social trust, bridging networks, civic engagement, organizational activism, informal networks) on individual charitable donations and volunteer activity and found that social capital may affect individual charitable behaviors in China. Using a representative dataset from the 2013 Survey on Philanthropic Behaviors of Urban Citizens in China, Wu et al. (2018) constructed five social capital indices (civic network, reciprocal norms, institutional trust, acquaintance trust, and stranger trust) to investigate the influence of social capital on volunteer activity in urban China; he found that civic network, norms of reciprocity, institutional trust, and stranger trust are positively associated with both volunteer activity and charitable donation, while acquaintance trust is negatively correlated with charitable donation but has no significant association with volunteer activity in China.

6.2.2 Gender Gap of Volunteer Activity Participation

The gender gap observed in volunteer activity participation may be considered according to two channels of influence.

First, volunteer activity participation can be considered a form of leisure. According to the neoclassic economics, there is a trade-off relationship between market work and leisure (e.g., volunteer activity). Gender role segregation, expressed as “men for work, women for family,” means that women have fewer hours for market work. Therefore, it is assumed that the probability of participating in volunteer activity is higher for women than for men (positive effect). Previous studies have revealed that women are more likely than men to participate in volunteer activity, and women spend more time on volunteer activity. Also, people with children are more likely to take part in volunteer activity and to spend more time on volunteer activity.

Second, some factors may decrease the probability of participating in volunteer activity more for women than for men. For example, women may take more responsibility for family care and housework than men do. Consciousness of participation in social activity may be less for women than for men; therefore the probability of participating in volunteer activity may be lower for women than for men (negative effect).

Thus, from the economics theory perspective, no clear conclusions can be drawn on the issue of the gender gap in volunteer activity participation because both positive and negative effects remain. When the negative effect is greater than the positive effect, the probability of participating in volunteer activity may be lower for women than for men, or vice versa. The gender gap in volunteer activity should be estimated based on empirical studies.

6.2.3 Contributions of This Study

The three main contributions of this study can be summarized as follows. First, regarding the issue of the determinants of volunteer activity participation, comparisons with studies of developed countries are scarce for China. The results of this study may provide useful new evidence for China.

Second, the previous studies use cross-sectional data and do not address the heterogeneity problem, and this may bias the results. This study uses a longitudinal data and a random effects (RE) model to address the problem.

Third, due to time constraints, there may be an endogeneity problem between participation in market work and participation in volunteer activity; for example, the two types of behaviors may be decided simultaneously. This problem has not been considered in previous studies. This study uses instrumental variables (IV) methods to address the endogeneity problem.

Fourth, although previous studies (Wu et al. 2018; Tong et al. 2018; Lin 2019) found that a gender gap remains in the probability of volunteering, they did not investigate differences in the mechanism of volunteer activity participation by gender. This study is the first to consider differences in the determinants of volunteer activity participation by gender.

6.3 Methodology and Data

6.3.1 Model

A probit regression model is used to investigate the probability of participating in volunteer activity in Eq. (6.1).

$$\Pr(Y_i = 1) = \Pr(a_0 + \beta_{ofe}Fe_i + \beta_{0X}X_i + v_i > 0) \quad (6.1)$$

In Eq. (6.1), $\Pr(Y_i = 1)$ denotes the probability of participating in volunteer activity. i indicates individuals, Fe is a female dummy variable, and X represents the control variables. The coefficients of variables are denoted by β_{ofe} and β_{0X} . In addition, a is a constant, and v is the error term. When β_{ofe} is statistically significant, it indicates that a gender gap remains in the probability of participating in volunteer activity.

Two econometric problems must be addressed in Eq. (6.1). First, there may be an endogeneity problem between market work and volunteer activity. Instrumental variables (IV) methods are used to address the endogeneity problem. IV methods are expressed as Eqs. (6.2.1) ~ (6.2.5).

$$\Pr(Work_i = 1) = \Pr(a_1 + \beta_{1Z}Z_i + \beta_{1fe}Fe_i + \beta_{1X}X_i + u_i > 0) \quad (6.2.1)$$

$$\Pr(\widehat{Work}_i = 1) = \Pr(a_1 + \beta_{1Z}Z_i + \beta_{1fe}Fe_i + \beta_{1X}X_i > 0) \quad (6.2.2)$$

$$Resi_i = PrWork_i - \widehat{PrWork}_i \quad (6.2.3)$$

$$\Pr(Y_i = 1) = \Pr(a_2 + \beta_{2Work}\widehat{Work}_i + \beta_{2fe}Fe_i + \beta_{2X}X_i + \varepsilon_i > 0) \quad (6.2.4)$$

$$\Pr(Y_i = 1) = \Pr(a_2 + \beta_{2Work}Work_i + \beta_{2Resi}Resi_i + \beta_{2fe}Fe_i + \beta_{2X}X_i + \varepsilon_i > 0) \quad (6.2.5)$$

$$corr(Z, \varepsilon) = 0 \text{ and } corr(Z, u) \neq 0$$

Based on Eqs. (6.2.1)–(6.2.5), a two-step procedure is used for estimates: (1) In the first step, we employ the probit regression model (Eq. (6.2.1)), and then calculate the imputed value of probability of participating in market work $\widehat{Work}$ (Eq. (6.2.2)) and the residual items $Resi$ (Eq. (6.2.3)). (2) In the second step, we use the imputed value of $\widehat{Work}$ or residual items $Resi$ as an explanatory variable and estimate the probability of participating in volunteer activity (Eqs. (6.2.4), (6.2.5)). Whether the estimates are unbiased hinges critically on the validity of instrumental variable (Z); that is, Z needs to be correlated with $Work$ while satisfying the conditions of $corr(Z, \varepsilon) = 0$, and needs not to be correlated with $\Pr(Y_i = 1)$ ($corr(Z, u) \neq 0$). We use the formal retirement experience dummy variable as the IV. IV methods include the two-stage least squares (2SLS), the two-stage predictor substitution (2SPS), and the two-stage residual inclusion (2SRI) model. Considering that the dependent variable of participation in volunteer activity is a binary variable, 2SPS and the 2SRI models are used in this study.⁷ The 2SPS model is expressed by Eq. (6.2.4), and the 2SRI model is expressed by Eq. (6.2.5).

The second econometric problem for Eq. (6.1) is the heterogeneity problem. v_i in Eq. (6.1) includes the unobserved individual-specific time-invariant effect, μ_i , and true error, δ_{it} ($v_{it} = \mu_i + \delta_{it}$). When the unobserved individual-specific time-invariant effect is not addressed, a bias may exist in the results. To address this problem, a random effects model is used. It is expressed by Eq. (6.3).

$$\Pr(Y_{it} = 1) = \Pr(a_3 + \beta_{3fe}Fe_{it} + \beta_{3X}X_{it} + \mu_i + \delta_{it} > 0) \quad (6.3)$$

Finally, to address the heterogeneity and other endogeneity problems simultaneously, a random effects (RE) probit regression model and IV methods is used. It is expressed by Eq. (6.4).

$$\Pr(Y_{it} = 1) = \Pr(a_4 + \beta_{4Work}Work_{it} + \beta_{4Resi}Resi_i + \beta_{4fe}Fe_{it} + \beta_{4X}X_{it} + \mu_i + \delta_{it}) > 0 \quad (6.4)$$

The Cragg-Donald Wald test is used as the weak instrumental variables test, and the Durbin-Wu-Hausman test is used to check for endogeneity between participation in market work and participation in volunteer activity.

To compare the differences in determinants of volunteer activity participation, we also run these models using female and male samples.

6.3.2 *Data*

The data for this study comes from the China Health and Retirement Longitudinal Survey (CHARLS). The CHARLS is conducted by Peking University every two years and covers representative regions of China. Its survey objects are individuals aged 45 and older. The baseline national wave of the CHARLS conducted in 2012 includes about 10,000 households and 17,708 individuals in 150 counties/districts and 450 villages/resident committees. The first and second follow-up survey waves are for 2014 and 2016. Information such as demographic characteristics, family structure, intra-household transfer, employment status, income, and other related information can be obtained from the CHARLS. This study uses data from three waves (CHARLS 2011, 2013, and 2015), including the most recent data from CHARLS 2015. To consider the influence of the retirement system in government organizations and enterprises, the sample is limited to individuals aged 45–69 years. The samples used in the analysis is 28,463 (sample of participation in volunteer activity is 4,491, sample of non-participation in volunteer activity is 23,972).

6.3.3 *Variable Setting*

Two dependent variables are constructed as follows: first, a binary variable for work is equal to 1 when an individual is working and equal to 0 when the individual is not working. It is used in the first stage of the IV method. In China, the individuals experienced formal retirement are those who worked in the public sector (e.g., government organization, state-owned enterprises) before retirement, majority of them can receive higher public pension benefits after mandatory retirement. It can be predicted that the probability of participation work are lower for the individuals experienced formal retirement than the counterpart (who exited labor market without formal retirement experience, for example, the self-employed). On the other hand, for the individuals exiting labor market, when the other factors are constant, because the leisure hours (time constraints) may be similar regardless of formal retirement experience, the influence of formal retirement experience on participation in volunteer activity may small. Therefore, the dummy variable of formal retirement experience (1 = has experienced the formal retirement, 0 = otherwise) is used as the IV in this study. The results of the first stage of the IV method are shown in the Appendix Table 6.4. Second, a binary variable for participation in volunteer activity is equal to 1 and equal to 0 when the individual is not participating in volunteer activity.

Based on the CHARLS questionnaire item “Have you done any of these activities in the last month,” when the respondent chooses “done volunteer or charity work,” “cared for a sick or disabled adult not coresident with you,” or “provided help to family, friends, or neighbors not coresident with you,” it qualifies as participation in volunteer activity.⁸

The main independent variables are conducted as follows. First, a female dummy variable is constructed to estimate the gender gap in volunteer activity participation.

Second, a set of variables of six factors are used as follows:

Market work

Based on the individual utility function in neoclassic economics theory, there is a trade-off relationship between market work and volunteer activity.⁴ It is expected that the probability of participating in volunteer activity is lower for the working group than for the non-working group because of time constraints. Carlin (2001) found that time spent on volunteer activity decreases as working hours increase. For Japan, Atoda et al. (1999), Atoda and Fukushima (2000), Yamauchi (2001), Ono (2006), and Moriyama (2007) reported that the probability of participating in volunteer activity is inversely proportionate to the householder’s working hours and working days. Although the labor force participation rate of women and men is higher for China than for other countries, the labor force participation rate for middle-aged women has decreased during the current period. It is assumed that there remains a trade-off relationship between labor market work and volunteer activity. The dummy variable of work is equal to 1 when an individual is working and equal to 0 when the individual is not working;

Education

Some research has demonstrated that educational background has a strong influence on participation in volunteer activity, and that persons with a higher level of education are more likely to volunteer (Vaillancourt 1994; Freeman 1997; Ma and Ono 2013; Wu et al. 2018; Tong et al. 2018; Lin 2019). This can be explained by the human capital theory (Becker 1964). It may also be that social contribution consciousness differs among different educational attainment groups. For example, Carlin (2001) found that the higher the market wage (higher educational attainment) of married women, the more they volunteer (probability of participating in volunteer activity, volunteer activity hours). It also can be expected that educational attainment may affect volunteer activity. There educational attainment level dummy variables—low, middle, and high education levels⁹ were used.

Income factors

Menchik and Weisbrod (1987) employed an empirical study to investigate the mechanism of participation in volunteer activity based on the consumption model. Menchik and Weisbrod (1987), Vaillancourt (1994), Ma and Ono (2013), Tong et al. (2018), and Lin (2019) found that the higher the unearned income, the longer the time spent on volunteer activities; conversely, the higher the market wage rate, the shorter the volunteer activity hours. Based on the consumption model advocated by Menchik

and Weisbrod (1987) and previous studies, it is assumed that the probability of participating in volunteer activity may be higher for the high-uneared income group than for the low-uneared income group in China.

Three income factor variables were constructed as: (i) the logarithmic value of the annual household consumption; (ii) the pension receipt dummy variable, which is equal to 1 when a woman is receiving a pension and equal to 0 when she is not; and (iii) the transfer to children dummy variable, which is equal to 1 when a women transfers her pension income to her children and equal to 0 when she does not.

Family care

Menchik and Weisbrod (1987), Morgan et al. (1977), and Vaillancourt (1994) found that the probability of volunteer activity tends to be lower and the hours of volunteer activity tend to be less when caring for infants.⁵ In a study of married women, Carlin (2001)⁶ found that the probability of participating in volunteer activity increases but the hours of volunteer activity decrease as the number of children increases. In Japan, Atoda et al. (1999), Atoda and Fukushige (2000), Yamauchi (2001), Ono (2006), Moriyama (2007), and Ma and Ono (2013) reported that the duties of family care (child care, parent care) and the number of children decrease the probability of participating in volunteer activity and the hours of volunteer activity.

Regarding family care in China, because the one-child policy had been in effect since 1979, most middle- and older aged women aged 45 and older in the survey years from 2011 to 2015 had one or two children, and most children were more than 14 years old. It can be assumed that, with an increase in the number of children, parents have more hours of work at home, which may decrease the probability of participating in volunteer activity. In contrast, family caregivers may have stronger altruistic values and greater motivation to volunteer to help others than those who are not family caregivers. It is predicted that the number of children may decrease the probability of participating in volunteer activity, but the availability of family care may increase the probability of participating in volunteer activity.

Three family factor variables were used as: (i) the number of children; (ii) the grandchildren caregiving dummy variable, which is equal to 1 when a women is caring for grandchildren and equal to 0 when she is not; and (iii) the child care giving variable, which is equal to 1 when a women is caring for children and equal to 0 when she is not.

Age

Both the probability of participating in volunteer activities and the time spent on such activities tend to change with age (Menchik and Weisbrod 1987; Vaillancourt 1994; Wu et al. 2018; Tong et al. 2018; Lin 2019). For example, for developed countries, Menchik and Weisbrod (1987) pointed out that, while the time spent on volunteer activity increases with age to a point, it decreases after the age of 43. Vaillancourt (1994) found that the most likely age for volunteering for both men and women is from age 15 to 19, and that while men are more likely to participate in volunteer activities from age 25 to 54, this probability decreases between age 55 and 69. For women, the probability of participating clearly decreases at age 70 and older. In America and

Canada, participation in volunteer activities during one's student years is utilized as one aspect of socio-cultural background that may influence the employment and wages of an individual, which may reinforce an individual's participation in volunteer activities; this is known as the human capital investment theory. In China, Wu et al. (2018) and Lin (2019) reported that the probability of participating in volunteer activity decreases with age for those aged 18 and older. Tong et al. (2018) found this was also true for people aged 60 and older; the probability of participating in volunteer activity decreases with age. To consider the lifestyle and situation of middle-aged and older individuals in China, regarding the decrease in health status and social contribution efforts with age, it is assumed that the probability of participating in volunteer activity decreases with age. Regarding the retirement eligibility age for women is 50 years for workers and 55 years for cadres, we constructed three age dummy variables—age 45–49, 50–59, and 60–69 years old.

Health status

Health status as a part of human capital can influence both market work and volunteer activity. Grossman (1972) advocated a health investment model to emphasize the importance of health status for an individual. It is expected that health status may enhance participation in volunteer activity. Atoda et al. (1999) and Ma and Ono (2013) found that a healthy status increases the probability of participating in volunteer activity in Japan. In China, Tong et al. (2018) and Wu et al. (2018) found that poor health status decreases the possibility of participating in volunteer activity. Based on the human capital theory (Becker 1964) and the results of previous empirical studies, it can be assumed that the probability of participating in volunteer activity is higher for the healthy group than for the group with poor health in China. The subjective health status (poor, fair, good, very good, excellent) dummy variables were used as the indices of health status.

Other factors

Gender, marital status, environmental changes (i.e., earthquakes, natural disasters), and community factors, have also been shown to possibly affect participation in volunteer activity (Schram and Dunsing 1981; Menchik and Weisbrod 1987; Vail-lancourt 1994; Atoda et al. 1999; Atoda and Fukushima 2000; Yamauchi 2001; Ono 2006; Moriyama 2007; Ma and Ono 2013). Therefore, the other factors such as gender, marital status, and regional disparity variables are also constructed as follows. (1) A female dummy variable is used to investigate the gender gap in volunteer activity participation. (2) According to the labor market segmentation hypothesis (Piore 1970), the behaviors of workers are shaped by the characteristics of the labor market. As is well known, the Chinese labor market is segmented by the population registration (*Hukou*) system. In 1958, the *Hukou* system was implemented by the government. Under the planned economy period from 1949 to 1977, migration from rural regions to urban regions was prohibited. Since the 1980s, the *Hukou* system has been deregulated, great differences in the labor market remain between rural and

urban areas. For example, the social security systems (i.e., public pension, medical insurance schemes) differ under the *Hukou* system. Therefore, a urban *Hukou* dummy variable is used to control the influence of segmentation, which is equal to 1 when a woman has urban *Hukou* and equal to 0 when the individual has rural *Hukou*. (3) A spouse dummy variable is conducted, which is equal to 1 when a woman has a husband and equal to 0 when she is single. (4) The culture and the economic development level may change for different periods; therefore, the year dummy variables (2011, 2013, 2015) are included in the control variables. Although previous studies (Wu et al. 2018; Lin 2019) reported that social capital may affect volunteer activity in China, because we cannot obtain the information from the CHARLS, this must be a future research issue. The gender gap of volunteer activity is discussed in the following section.

Table 6.1 presents descriptive statistics for (a) the total sample, (b) participation in a volunteer activity group (PVA), and (c) non-participation in a volunteer activity group (non-PVA) of individuals aged 45–69. It is observed that (1) in China, the proportion of participation in volunteer activity for individuals aged 45–69 is 15.8%. (2) To compare the employment rate between PVA group and non-PVA group, it is 7.6% points higher for the PVA group than for the non-PVA group. (3) The proportion of middle-and high-level education groups is higher for the PVA group than for the non-PVA group. (4) The income level is higher for the PVA group than for the non-PVA group. In addition, the proportion of income transferred to children is higher for the PVA group than for the non-PVA group, while the proportion of pension recipients is lower for the PVA group than for the non-PVA group. (5) The number of children is less for the PVA group than for the non-PVA group, but the proportions of both caring for grandchildren and for parents are higher for the PVA group than for the non-PVA group. (6) The proportion of women with poor health status is 7.0% points lower for the PVA group than for the non-PVA group, while the proportion of healthy women is higher for the PVA group. The results show that individual attributes, family structure, and income factors differ between the PVA group and the non-PVA group. These factors should be controlled in estimations.

6.4 Results

6.4.1 Gender Gap in Volunteer Activity Participation

Table 6.2 displays the results for determinants of volunteer activity participation. Five models are used. To compare the appropriateness of these models, first, the likelihood-ratio test of $\rho = 0$ indicated that the random effects model is more appropriate than the probit regression model (Model 1). Second, the Cragg-Donald Wald test results are more than 10 for Model 2, Model 3, and Model 5 (121.41 for Model 2, 190.06 for Model 3, and 122.63 for Model 5), suggesting that the instrumental variables in these models are not weak IVs. The results of the Durbin-Wu-Hausman test suggest that

Table 6.1 Descriptive statistics of variables

	Total (a)		PVA (b)		Non-PVA (c)		D b-c
	Mean	S.D	Mean	S.D	Mean	S.D	
Volunteer activity participation	0.158	0.365					
Female	0.483	0.500	0.439	0.496	0.492	0.500	−0.053
Work	0.765	0.424	0.829	0.377	0.753	0.431	0.076
Education							
Low-education	0.860	0.347	0.796	0.403	0.872	0.335	−0.076
Middle-education	0.118	0.323	0.160	0.367	0.110	0.313	0.050
High-education	0.022	0.147	0.044	0.205	0.018	0.133	0.026
Consumption	8.907	0.911	9.139	0.925	8.864	0.902	0.275
Pensioner	0.285	0.452	0.267	0.443	0.289	0.453	−0.022
Transfer to children	0.379	0.485	0.507	0.500	0.355	0.479	0.152
Number of children	2.361	1.191	2.186	1.119	2.394	1.201	−0.208
Grandchildren care	0.402	0.490	0.412	0.492	0.401	0.490	0.011
Parent care	0.093	0.291	0.125	0.331	0.087	0.282	0.038
Age	56.186	6.852	54.689	6.667	56.467	6.850	−1.778
Health status							
Poor	0.206	0.404	0.147	0.355	0.217	0.412	−0.070
Fair	0.523	0.500	0.532	0.499	0.521	0.500	0.011
Good	0.148	0.355	0.162	0.369	0.145	0.352	0.017
Very good	0.111	0.314	0.138	0.345	0.106	0.307	0.032
Excellent	0.013	0.113	0.020	0.139	0.012	0.107	0.008
Urban	0.211	0.408	0.261	0.439	0.201	0.401	0.060
Having spouse	0.924	0.265	0.931	0.253	0.923	0.267	0.008
Survey year							
y2011	0.305	0.460	0.161	0.368	0.332	0.471	−0.171
y2013	0.340	0.474	0.364	0.481	0.335	0.472	0.029
y2015	0.355	0.479	0.475	0.499	0.333	0.471	0.142
Observations	28,463		4,491		23,972		

Source Calculated based on CHARLS2011-2015

Note PVA: participation in volunteer activity; Non-PVA: Non-participation in volunteer activity

the instrumental variables in both Model 2 and Model 5 are endogenous variables that should be addressed by instrumental variables methods. Based on these results, it can be considered that Model 5 is more appropriate than the other models. Based on the results from Model 5, the new findings are summarized as follows.

Table 6.2 Determinants of volunteer activity participation (total samples)

	(1) Probit		(2) IV(2SPS)		(3) IV(2SRD)		(4) Random-effects (RE)		(5) RE and IV(2SPS)	
	dy/dx	z-value	dy/dx	z-value	dy/dx	z-value	dy/dx	z-value	dy/dx	z-value
Female	-0.024***	-5.60	-0.036***	-6.87	-0.003	-0.33	0.116***	3.75	-0.012	-0.26
Work	-0.012***	-9.66	-0.051**	-2.18	-0.043*	-1.69	0.279***	9.31	-0.208*	-1.70
Residual item					0.101***	4.17				
Education (Low-education)										
Middle-education	0.035***	5.10	0.036***	5.22	0.033***	4.85	0.163***	4.64	0.156	4.44
High-education	0.083***	5.47	0.095***	6.18	0.095***	6.09	0.366***	5.25	0.412***	5.83
Income	0.018***	7.05	0.014***	5.28	0.014***	5.42	0.086***	6.71	0.071***	5.35
Pensioner	0.027***	4.13	0.016***	2.35	0.018***	2.57	0.130***	3.99	0.082***	2.38
Transfer to children	0.048***	10.63	0.052***	11.30	0.052***	11.22	0.227***	10.15	0.245***	10.66
Number of children	-0.006***	-2.76	-0.005***	-2.60	-0.005**	-2.39	-0.029**	-2.73	-0.026**	-2.45
Grandchildren care	0.014***	3.13	0.011**	2.39	0.011***	2.57	0.072***	3.20	0.055***	2.41
Parent care	0.082***	10.08	0.086***	10.51	0.086***	10.46	0.345***	9.53	0.361***	9.89
Age (age45-49)										
Age50-59	-0.029***	-5.45	-0.035***	-6.27	-0.034***	-6.12	-0.133***	-4.76	-0.165***	-5.67
Age60-69	-0.068***	-9.48	-0.079***	-9.99	-0.079***	-9.91	-0.336***	-8.51	-0.410***	-9.33
Health status (Poor)										
Fair	0.024***	4.07	0.034***	5.33	0.033***	5.25	0.120***	4.00	0.168***	5.11
Good	0.036***	4.57	0.050***	5.79	0.048***	5.57	0.162***	4.25	0.219***	5.32
Vey good	0.043***	5.12	0.057***	6.18	0.056***	6.03	0.198***	4.89	0.257***	5.88
Excellent	0.074***	3.74	0.087***	4.27	0.088***	4.27	0.318***	3.62	0.383***	4.28

(continued)

Table 6.2 (continued)

	(1) Probit		(2) IV(2SPS)		(3) IV(2SRI)		(4) Random-effects (RE)		(5) RE and IV(2SPS)	
	dy/dx	z-value	dy/dx	z-value	dy/dx	z-value	dy/dx	z-value	dy/dx	z-value
Having spouse	-0.017**	-2.01	-0.009	-1.08	-0.009	-1.04	-0.087**	-2.03	-0.051	-1.15
Urban	0.027***	4.34	-0.005	-0.61	-0.035***	-6.58	-0.108***	-4.68	-0.172***	-6.17
Survey year (y2011)										
y2013	0.091***	14.70	0.096***	15.26	0.094***	15.03	0.431***	14.77	0.446***	15.17
y2015	0.133***	20.09	0.135***	20.36	0.134***	20.18	0.612***	19.71	0.623***	20.00
Number of obs	28,463		28,463		28,463		28,463		28,463	
Number of groups							16,508		16,508	
Likelihood-ratio test of rho = 0							chibar2(01) = 150.25		chibar2(01) = 154.94	
Pseudo R2	0.063		0.045		0.064					
Prob > = chi2(chibar2)	0.000		0.000		0.000		0.000		0.000	
Cragg-Donald Wald F-test			121.41		190.06				122.63	
			(P = 0.000)		(P = 0.000)				(P = 0.000)	
Durbin-Wu-Hausman			10.106		1.295				18.674	
			(P = 0.002)		(P = 0.255)				(P = 0.004)	

Source Calculated based on CHARLS2011-2015

Note (1) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

(2) Probit regression models are used. 2SPS: two-stage predictor substitution instrument variable methods; 2SRI: two-stage residual inclusion instrument variable methods; RE: random effects model

(3) Total samples including women and men are used

First, based on the results of Model 1, it is shown that the probability of participating in volunteer activity is smaller for women than for men; however, when the heterogeneity problem and the other endogeneity problem are addressed simultaneously (Model 5), the coefficient of the female dummy variable is not statistically significant. This suggests that the influence of unobservable factors—such as individuals' preferences and social participation ability—is greater; when these factors are not considered, the results may reflect an estimation bias.

Second, for the other determinants of volunteer activity,

- (1) The probability of participating in volunteer activity is 20.8% points lower for the working group than for the non-working group. A trade-off relationship between market work and social activity is indicated. The results are consistent with those of Atoda et al. (1999), Atoda and Fukushima (2000), Yamauchi (2001), Carlin (2001), Ono (2006), and Moriyama (2007).
- (2) The probability of participating in volunteer activity is 42.2% points higher for the highly educated group than for the low-educational level group. These results are consistent with those of Vaillancourt (1994), Freeman (1997), and Ma and Ono (2013).
- (3) The probabilities of participating in volunteer activity are higher for the high-income group, for the pensioner group, and for the group transferring their pension income to their children. This suggests that the higher the level of income or wealth, the higher the probability of participating in volunteer activity. It is confirmed that the probability of participating in volunteer activity is higher for the group with high unearned income than for the group with low unearned income. These results are consistent with those of Menchik and Weisbrod (1987), Vaillancourt (1994), and Ma and Ono (2013). The consumption model is supported for individuals aged 45–69 in China.
- (4) The coefficient of the number of children is a negative value, both caring for grandchildren and parents are positive values, and they are all statistically significant. This indicates that a higher number of children decreases the probability of participating in volunteer activity, but the availability of family care increases the probability of participating in volunteer activity. The results for the number of children are consistent with those of Atoda et al. (1999), Atoda and Fukushima (2000), Yamauchi (2001), Ono (2006), Moriyama (2007), and Ma and Ono (2013). However, the results for family care (grandchildren care, parent care) are not consistent with those of Menchik and Weisbrod (1987), Morgan et al. (1977), and Vaillancourt (1994). The reason may be as follows. The analyzed objects in previous studies included younger generations with younger children who need more parental (particularly mothers') care, but the analyzed objects in this study are individuals aged 45–69. The time constraints of work and family care differ by generation—younger, middle-aged, or older—therefore, the influence of family care on volunteer activity participation may differ for

each age group. In addition, it may be that family caregivers have more altruistic values and motivation to provide more volunteer support to others than non-family caregivers do. Ma and Ono (2013) found that, in Japan, the probability of participating in the volunteer labor supply is higher for those with strong altruistic values.

- (5) The probability of participating in volunteer activity for those aged 45–49 is 16.5% points, which is 41.0% points lower than for those aged 50–59 and 60–69. This suggests that age negatively affects the probability of participating in volunteer activity, indicating that the probability of participating in volunteer activity decreases with age.
- (6) The probability of participating in volunteer activity is higher for those who are healthy than for those with poor health (16.8%, 21.9%, 25.7% and 38.3% points higher for fair, good, very good and excellent health groups). These results indicate that the probability of participating in volunteer activity is higher for the healthy group than for the group in poor health. These results are consistent with those of Atoda et al. (1999) and Ma and Ono (2013).

6.4.2 Gender Gap of Determinants of Volunteer Activity Participation

To compare differences in the mechanism of participation in volunteer activity by gender, we employ the estimations for groups of women and men. Estimations using the random effects (RE) model or random effects and IV method (RE_IV) by age and region are performed to address the heterogeneities of different groups. The results of the tests for weak instrumental variables and endogeneity, indicate that the RE model is appropriate for the female group, and the RE_IV model is appropriate for the male. The results by using these models are summarized in Table 6.3.

The results indicate that all six factors influence the probability of participating in volunteer activity for both women and men, but the influences of these factors differ by gender. Notably,

- (1) Market work negatively affects the probability of participating in volunteer activity for women (-0.422), while work is not statistically significant for men. This suggests that the negative effect of work is greater for women than for men. The results can be explained as follows. Family responsibilities are greater for women than for men. For example, in general, housework hours are longer for women than for men, and the problem of work–family conflict may be more severe for women than for men; therefore, the negative effect of work on participation in social activity is greater for women than for men.
- (2) Education positively affects volunteer activity participation for both women and men; the effect of education is greater for women than for men.
- (3) Both income level and transfer of income to children positively affect participation in volunteer activity for both women and men.

Table 6.3 Determinants of volunteer activity participation by female and male groups

	(1) Female		(2) Male	
	RE		RE	
	dy/dx	z-value	dy/dx	z-value
Work	−0.422**	−2.19	0.118	0.69
Education (Low-education)				
Middle-education	0.161***	2.80	0.149***	3.35
High-education	0.554***	4.72	0.350***	3.93
Income	0.038*	1.93	0.102***	5.52
Pension	0.079*	1.63	0.062	1.24
Transfer to children	0.224***	6.63	0.269***	8.55
Number of children	−0.013	−0.86	−0.038**	−2.54
Grandchildren care	−0.011	−0.32	0.124***	3.84
Parent care	0.404***	7.49	0.329***	6.62
Age (age45–49)				
Age50–59	−0.136***	−3.08	−0.204***	−5.14
Age60–69	−0.421***	−6.39	−0.376***	−6.12
Health status (Poor)				
Fair	0.194***	4.13	0.149***	3.13
Good	0.163***	2.62	0.254***	4.47
Vey good	0.323***	4.95	0.210***	3.48
Excellent	0.396***	2.87	0.358***	3.01
Control variables	Yes		Yes	
Number of obs	13,761		14,702	
Number of groups	8,221		8,287	
Likelihood-ratio test of $\rho = 0$	chibar2(01) = 43.15		chibar2(01) = 104.14	
Prob > = chi2(chibar2)	0.000		0.000	
Cragg-Donald Wald F-test	210.75 (P = 0.000)		150.22 (P = 0.000)	
Durbin-Wu-Hausman	0.385 (P = 0.535)		0.106 (P = 0.774)	

Source Calculated based on CHARLS2011–2015

Note (1) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

(2) The random effects probit regression model (RE) is used for female group, and the random effects probit regression and instrument variable methods (RE_IV) is used for male group

(3) Control variables include urban, having spouse and survey year dummy variables. The results of control variables are not expressed in this table

- (4) Although the coefficient of the number of children is a negative value for men, it is not statistically significant for women. Parental caregiving positively affects participation in volunteer activity for both women and men. In addition, receiving a pension may increase the probability of participating in volunteer activity for men. This suggests that the influence of family factors on volunteering is greater for men than for women.
- (5) The probability of participating in volunteer activity decreases with age for both women and men.
- (6) Better health status positively affects volunteer activity participation for both women and men.

6.5 Conclusions

This study investigates the determinants of participation in volunteer activity of individuals aged 45–69 in China. It uses the longitudinal data of the China Health and Retirement Longitudinal Survey (CHARLS) from 2011 to 2015. The random effects (RE) model and instrumental variables (IV) methods are used to address the unobserved heterogeneity and other endogeneity problems. The main findings are as follows.

First, the probability of participating in volunteer activity is smaller for women than for men. However, when the endogeneity problem are addressed, the coefficient of the female dummy variable is not statistically significant. This suggests that the influence of unobservable factors—such as individuals’ preferences and abilities—on the gender gap of participation in volunteer activity is greater.

Second, for the determinants of participating in volunteer activity, the results indicate that, in general, (1) market work may decrease the probability of participating in volunteer activity. (2) The probability of participating in volunteer activity is higher for the well-educated group than for the less-educated group. (3) The probability of volunteer activity participation is higher for the high-income group than for the low-income group. (4) A greater number of children decreases the probability of participating in volunteer activity, but family care increases the probability of participating in volunteer activity. (5) The probability of participating in volunteer activity decreases as age increases. (6) The probability of participating in volunteer activity is higher for the healthy group than for the group in poor health.

Third, the results indicate that the influence of determinant factors on participating in volunteer activity is different by gender. For example, the negative influence of work on participation in volunteer activity is greater for women than for men.

Two significant policy implications are indicated by these results. First, participation in labor market work negatively affects participation in volunteer activity. There is a trade-off relationship between working hours and leisure (volunteer activity), particularly for women. This may be because the responsibility of work at home (e.g., child care, parent care) is greater for women than for men.¹⁰ Therefore, accommodating both work and leisure is more difficult for women; in other words, work–family conflicts may be greater for women than for men. The probability of participating in social activity decreases as working hours are lengthened, particularly for female workers. Work–life balance policies, including the policy to promote men’s participation in housework and family, and the mandatory family care leave system may increase women’s participation in social activity. Nevertheless, the introduction of flexible systems of managing working hours (e.g., part-time work, job sharing, flexible working hours systems, or revising excessive overtime work) is imperative.

Second, the results suggest that the higher the unearned income, the higher the probability of participating in volunteer activity. Income inequality may contribute to the gap in volunteer activity participation. A low income may decrease participation in social activity, which may decrease social capital and increase the risk of social alienation. How to support the low-income group’s participation in social activity, thereby increasing their well-being, is an important issue for the government.

Finally, the limitations of this study should be clarified. This study uses panel data (CHARLS from 2011 to 2015) to provide an empirical analysis of the gender gap in volunteer activity participation for individuals aged 45–69. The survey target objects of the CHARLS are individual aged 45 and older; therefore, samples in this study do not include younger generations. Further research to compare younger generations with middle-aged and older generations should be considered in the future. Even more detailed analysis of factors on the volunteer demand side is needed for China.

Notes

1. According to Snyder and Omoto (2008), volunteer activity is defined as “freely chosen and deliberate helping activities that extend over time, are engaged in without expectation of reward or other compensation and often through formal organizations, and that are performed on behalf of causes or individuals who desire assistance.”
2. For detailed descriptions of the theories of volunteering, please refer to Haski-Leventhal (2009), Hustinx et al. (2010), and Snyder and Omoto (2008).
3. For literature review of empirical studies of volunteering, please refer to Smith (1994), Bekkers and Wiepking (2010), and Wilson (2012).

4. Please refer to Ma and Ono (2013) for a more detailed overview of the empirical research on volunteer activity.
5. Menchik and Weisbrod (1987) conducted a Tobit analysis of determining factors of volunteer activity hours, using data from a survey conducted by Morgan et al. (1977). Vaillancourt (1994) employed a probit regression analysis of determining factors of the probability of participating in volunteer activity, using survey data from Canada's 1987 Labor Force Survey (LFS).
6. In an analysis focusing on married women, Carlin (2001) used data from a 1975–1976 US survey on non-work time to conduct a probit regression analysis of the probability of participating in volunteer activity. Carlin estimated the volunteer activity time function, considering the selection bias based on the choice of whether to participate in volunteer activity.
7. The 2SRI model was advocated first by Hausman (1978), and then it was used by Blundell and Smith (1989). Newey (1987), Rivers and Vuong (1988), Newey and McFadden (1994), and Terza et al. (2005, 2008) pointed out that the SRI model can be used in binary variable analyses and can be considered to be an expansion of the 2SLS model for binary variable analyses.
8. To check for robustness, the only information used to define volunteer activity is the individual's responses to "Done voluntary or charity work"; results using this narrow definition of volunteer activity are similar to those using the broad definition in this study.
9. The low-education category includes those with no formal education, those who did not finish primary school, those who were homeschooled, and those completing elementary school; the middle-education category includes those who completed junior high school, senior high school, and vocational school; the highly educated category includes those who attended college, university, or graduate school.
10. For the gender gap in home responsibilities, such as child care and parent care, please refer to Chaps. 2 and 3 of this book.

Appendix

See Table 6.4.

Table 6.4 Probability of work (first-stage estimation in the IV methods)

	(1) Probit		(2) Random effects probit	
	dy/dx	z-value	dy/dx	z-value
Formal retirement	−0.293***	−26.37	−1.351***	−22.55
Female	−0.148***	−28.53	−0.880***	−23.17
Education (Low-education)				
Middle-education	0.003	0.33	−0.004	−0.08
High-education	0.058***	3.57	0.330***	2.77
Age (age45–49)				
Age50–59	−0.076***	−9.98	−0.433***	−9.56
Age60–69	−0.187***	−19.38	−0.993***	−17.57
Having spouse	0.090***	9.34	0.477***	8.37
Health status (Poor)				
Poor	0.122***	19.71	0.618***	16.75
Fair	0.119***	16.47	0.769***	14.97
Good	0.119***	15.20	0.780***	13.63
Excellent	0.121***	6.48	0.846***	6.06
Urban	−0.187***	−22.36	−0.947***	−19.08
Grandchildren care	−0.032***	−6.12	−0.151***	−4.86
Parent care	0.044***	4.80	0.223***	4.08
Number of children	−0.001	−0.54	−0.009	−0.6
Transfer to children	0.058***	10.81	0.274***	8.83
Income	−0.027***	−8.96	−0.121***	−6.92
Pensioner	−0.021***	−2.88	−0.152***	−3.84
Survey year (y2011)				
y2013	0.020***	3.11	0.110***	3.23
y2015	0.013*	1.93	0.027	0.74
Number of obs	28,463		28,463	
Number of groups			16,508	
Likelihood-ratio test of rho = 0			chibar2(01) = 1512.84	
Pseudo R2	0.200			
Prob > = chi2	0.000		0.000	

Source Calculated based on CHARLS2011–2015.

Note *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

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