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## Determinants of Japanese Participation in Volunteer Activities in the 2000s

Masayuki Hiromoto

### Abstract

This paper aims to determine the factors that induced Japanese people to participate in volunteer activities in the 2000s. The 1990s serve as the baseline for the evolution of community welfare efforts in Japan. During the 2000s, community welfare efforts were developed and enhanced. This study analyzes volunteer activities conducted in the 2000s in order to ascertain whether determinants of participation in volunteer activities earlier in the century differ from determinants in the 2010s, as defined by Hiromoto (2016). Multiple linear regression analyses reveal inducements to volunteer activities. Whereas the determinants of participation in volunteer activities aiding the elderly from 2000 to 2001, from 2005 to 2006, and from 2010 to 2011 are similar, the determinants of participation in volunteer activities aiding children from 2000 to 2001 differ from those for the periods from 2005 to 2006 and from 2010 to 2011. These results imply that volunteer activities aiding the elderly have remained stable since the beginning of the 2000s whereas characteristics of volunteer activities aiding children have changed.

### I. Introduction

Hiromoto (2016) analyzed volunteer activities conducted in Japan using data sets from *The 2011 Survey on Time Use and Leisure Activities (Heisei 23 nen shakai seikatsu kihon chōsa hōkoku)*. The data sets include information about the percentages of people who participated in volunteer activities aiding the elderly and children from October 2010 to October 2011. Hiromoto (2016) discovered a direct relationship between the degree of ruralism and the percentage of individuals who had participated in volunteer activities aiding the elderly in the past year. Volunteer work with the elderly was very

common in rural areas. The analysis did not shed light on volunteer activities aiding children.

This study analyzes volunteer activities aiding the elderly and children before 2010 in Japan. The 1990s serve as the baseline for significant public welfare programs for the elderly and parents rearing children. Article Four of the Social Welfare Act of 2000 stipulates that residents should foster community welfare for community members who require welfare services. This study attempts to determine whether conspicuous changes occurred during or after the 2000s in terms of community welfare or community volunteer activities.

Side-by-side and lively salons (*fureai ikiiki saron*), which provide opportunities to promote friendship between the volunteers and the elderly, young children, or parents of young children, have increased in number since the 1990s (Shakai fukushi kyōgikai 2014, 86). Elderly people, young children, and parents of young children visit salons to enjoy conversation, recreation, and meals. Childcare spaces (*kosodate hiroba*) are places that provide young children and their parents with entertainment and relaxation. Community residents not only volunteer at these venues, but also establish and manage them. These residents' activities are representative of community welfare work and are the focus of this study.

## II. Methodology

This study utilized the methodology of Hiromoto (2016) to ascertain the determinants of participation in volunteer activities aiding the elderly and children. Multiple linear regression analyses were conducted using prefecture as the unit of analysis. The dependent variables are the percentages of participants in volunteer activities aiding the elderly and children. The study utilized IBM SPSS Statistics Version 22 to conduct the regression analyses.

Principal component analyses were conducted to consolidate independent variables concerning the elderly, children, financial conditions of prefectural and municipal governments, social networks, and semi-public/semi-private individuals (*minsei iin*, commissioned welfare volunteers) and organizations (*shakai fukushi kyōgikai*, councils of social welfare) working for social

welfare. Many variables can influence participation in volunteer activities aiding the elderly or children. Multiple regression analysis utilizing many independent variables can induce a problem of multicollinearity. Principal component analysis condenses these variables into fewer principal components.

The data sets on participation in volunteer activities come from the 2001 and 2006 editions of *The Survey on Time Use and Leisure Activities*. Two data sets hold information about percentages of people who participated in volunteer activities from October 2000 to October 2001 and from October 2005 to October 2006. These surveys are conducted every five years. Hiromoto (2016) employed the results of the 2011 survey, which is the latest survey published in a book form. This study excludes the 2011 survey results. Table 1 shows the dependent variables for the multiple linear regression analyses.

It would have been useful to analyze the data sets for volunteer activities before 2000 in order to determine the impact of the Social Welfare Act of 2000 on volunteerism, however, the data sets for volunteer activities before 2000 lack detailed information. For example, they present comprehensive percentages of respondents who aided the elderly, children, or the disabled even though there may be different motivations for volunteer activities directed toward these three populations. This study employs the data sets for the periods from 2000 to 2001 and from 2005 to 2006 in order to reveal respective determinants of volunteer activities aiding the elderly and children.

The independent variables for the multiple linear regression analyses are principal component scores. The variables employed for the principal component analyses of Hiromoto (2016) are utilized for the principal component analyses of this study. The variables for the principal component analyses are the elderly, children, financial conditions of prefectural and municipal governments, social networks, and semi-public/semi-private individuals and organizations working for social welfare.

Surveys were conducted in October 2001 and October 2006 to determine whether the respondents participated in a volunteer activity in the past twelve months. The principal component analyses employed data for

Fiscal Years (FY) 2001 and 2006. However, three variables do not have data for these FYs. If there are no data for these FYs, the principal component analyses utilize data for FY 2000 or FY 2005. Table 2 identifies the variables. The principal component analyses were conducted using IBM SPSS Statistics Version 22.

Tables 3 and 4 display the results of the principal component analyses of the periods from 2000 to 2001 and from 2005 to 2006, respectively. Each principal component analysis identifies five principal components whose eigenvalues are higher than 1. Hiromoto's (2016) principal component analysis of the period from 2010 to 2011 also identified five principal components whose eigenvalues are higher than 1.

The first principal components (PC1) of two principal component analyses possess high principal component loadings of the percentage of the elderly in the population. However, the average numbers of elderly people and children residing in a municipality, and the densities of the elderly and children obtain negative principal component loadings. The principal component loadings of taxes of prefectural and municipal governments are negative. Positive and high principal component loadings are assigned to bonds and debt services of prefectural and municipal governments divided by the population, and outstanding bonds of prefectural and municipal governments divided by the population. Prefectural and municipal expenditures on elderly welfare divided by the population, and prefectural expenditures on child welfare divided by the population acquire positive and high principal component loadings. The percentages of individuals who changed residence obtain negative principal component loadings. The percentages of owned houses and self-employed individuals acquire positive principal component loadings. The numbers of commissioned welfare volunteers and municipal councils of social welfare divided by population obtain positive principal component loadings.

These results signify that PC1 represents a high percentage of elderly people, low population density, fragile financial conditions of prefectural and municipal governments, solid social networks, and many half-public/half-private individuals and organizations working for social welfare. Thus, PC1 can be termed "ruralism."

The second principal component (PC2) that the two principal component analyses obtain holds relatively high absolute values of several principal component loadings. The percentage of children in the population holds negative principal component loadings. The PC2 acquires positive principal component loadings for the average numbers of the elderly and children residing in a municipality and for the density of the elderly and children in the population. Positive principal component loadings are assigned to prefectural taxes and prefectural and municipal expenditures on welfare for the elderly and children divided by the population. The principal component loadings of the average number of family members and the percentages of households owning their houses are negative.

The PC2 denotes a low percentage of children in the population, high population density, a healthy condition of prefectural government finance, small family size, and a low percentage of households owning homes. These characteristics correspond to an urban area rather than a rural or suburban area. Thus, PC2 is termed “urbanism.”

The variable of housewives/househusbands holds the highest absolute value of principal component loadings in the third principal component (PC3). The dissimilar signs are held by the principal component loadings of housewives/househusbands obtained in the analyses of the periods from 2000 to 2001 and from 2005 to 2006. Thus, PC3 is termed “housewives/househusbands.”

The fourth principal component (PC4) of two principal component analyses share the results that relatively high absolute values of principal component loadings are given to the average family size, the percentage of people who moved, and the percentage of households owning their homes. Whereas the average family size and the percentage of households owning their homes hold positive principal component loadings, the percentage of individuals who changed residence obtains negative principal component loadings. Thus, PC4 is termed “firm social networks.”

The fifth principal component (PC5) obtains positive principal component loadings of the percentage of children in the population and municipal expenditures on child welfare divided by the population. Thus, PC5 is termed “municipal governments’ programs for child welfare.”

These five titles of PC1 through PC5 are to designate the five principal components obtained in Hiromoto's (2016) principal component analysis of the period from 2010 to 2011.

### III. Results of Multiple Linear Regression Analyses

The principal component scores of PC1 (ruralism), PC2 (urbanism), PC3 (housewives/househusbands), PC4 (firm social networks), and PC5 (municipal child welfare programs) are employed as the independent variables for multiple linear regression analyses. The dependent variables are the percentages of volunteers in the population as classified into two groups based on the population receiving aid: the elderly and children. Each volunteer group consisted of six brackets of population: people aged fifteen years or older, people aged fifteen to twenty-four years, people aged sixty-five years or older, people aged sixty-five to seventy-four years, people aged seventy-five years or older, and students aged fifteen years or older. Hence, there are twelve dependent variables for the multiple linear regression analyses of each period of 2000–2001 and 2005–2006.

Table 5 displays adjusted R-squares and significance probabilities of the regression models. The regression models significant at the 5% level are: fifteen-year-old or older individuals aiding the elderly from 2000 to 2001; fifteen-year-old or older individuals aiding the elderly from 2005 to 2006; fifteen-year-old or older individuals aiding children from 2000 to 2001; fifteen-to-twenty-four-year-old individuals aiding children from 2000 to 2001; and students aiding children in 2000 to 2001.

Table 6 shows the standardized partial regression coefficients and the significance probabilities of the independent variables for the regression models significant at the 5% level. The regression analysis of fifteen-year-old or older volunteers aiding the elderly from 2005 to 2006 reveals that the independent variable of ruralism has a positive regression coefficient significant at the 5% level. This result implies that rural areas tended to enjoy relatively high percentages of volunteers aiding the elderly in 2005 and 2006. Relatively many volunteers are inclined to reside in areas where the percentage of the elderly in the population is high, the population density is low, financial conditions of prefectural and municipal governments are fragile,

firm social networks are spread, the numbers of semi-public/semi-private individuals and organizations working for social welfare divided by population are high.

The regression model significant at the 5% level is obtained in the regression analysis of fifteen-year-old or older people aiding the elderly in 2000 and 2001. Ruralism is significant and possesses a positive regression coefficient.

Three regression analyses of volunteers aiding children in 2000 and 2001 obtain the regression models significant at the 5% level. These regression analyses employ the dependent variables of individuals aged fifteen years or older, individuals aged fifteen to twenty-four years, and students. Urbanism and housewives/househusbands are the independent variables significant at the 5% level in the regression analysis of individuals aged fifteen years or older. The regression coefficients of urbanism and housewives/househusbands are negative and positive, respectively. The principal component loading of housewives/househusbands for PC3 obtained in the principal component analysis of the period from 2000 to 2001 is negative. Therefore, an area where relatively fewer housewives or househusbands reside tended to have many volunteers aiding children. The independent variables of housewives/househusbands and firm social networks are significant at the 5% level in the regression analysis of fifteen-to-twenty-four-year-old individuals aiding children. The signs of the regression coefficients are positive. Those independent variables are also significant at 5% level in the regression analysis of students aiding children. The independent variables possess positive regression coefficients. Hence, relatively more students participate in volunteer activities aiding children in an area where fewer housewives and househusbands reside or where solid social networks spread.

#### IV. Discussion

The analyses employing the data for 2010 and 2011 revealed that rural areas tended to relatively high percentages of individuals aged ten years or older, individuals aged fifteen to twenty-four years, and students aiding the elderly. The analyses could not ascertain what induces participation in volunteer activities aiding children (Hiromoto 2016, 510–11).

Hinomoto (2016) and this study share a common analysis result. Ruralism is a determinant of participation in volunteer activities aiding the elderly in 2000–2001, 2005–2006, and 2010–2011. The independent variable of ruralism is significant at the 5% level in the regression analyses of individuals aged ten/fifteen years or older in all three periods. The regression coefficients of the independent variable are positive. Rural areas have tended to enjoy relatively many volunteers aiding the elderly since 2000.

The independent variable of ruralism is not significant at the 5% level in the regression analysis of fifteen-to-twenty-four-year individuals and students aiding the elderly in 2000–2001 and 2005–2006. This is in contrast to the results of the regression analyses employing the data sets for 2010 and 2011. It is a recent tendency that rural areas enjoy a relatively high percentage of young volunteers and student volunteers aiding the elderly.

A notable distinction between Hinomoto (2016) and this study is whereas Hinomoto (2016) cannot identify a determinant of participation in volunteer activities aiding children, this study identifies significant independent variables in the regression analyses of volunteers aiding children in 2000 and 2001. The independent variable of urbanism gains a significant and negative regression coefficient in the regression analysis of fifteen-year-old or older individuals aiding children in 2000 and 2001. Hence, urban areas had a tendency to have a lower percentage of individuals participating in volunteer activities aiding children than rural or suburban areas.

The independent variable of housewives/househusbands is significant and positive in the regression analyses of fifteen-year-old or older individuals, fifteen-to-twenty-four-year-old individuals, and students aiding children in 2000 and 2001. As explained above, the principal component loading of housewives/househusbands for PC3 in the principal component analysis of 2000 and 2001 holds a negative sign. Therefore, prefectures where percentages of housewives/househusbands in the population are relatively low enjoyed relatively high percentages of volunteers aiding children. These results imply that there existed relatively more volunteers aiding children in prefectures where both wives and husbands tended to work for salaries.

The independent variable of firm social networks (PC4) is positive and significant at the 5% level in the regression analyses of fifteen-to-twenty-four-



year individuals and students aiding children in 2000 and 2001. A relatively high percentage of young individuals and students aiding children is anticipated in a prefecture where the average family size is bigger, the percentage of individuals who changed residence is lower, and the percentage of households owning their homes is higher. The independent variable of firm social networks is not significant in the regression analyses of the periods from 2005 to 2006 and from 2010 to 2011. These results imply that determinants of participation in volunteer activities aiding children have altered in the 2000s. Firm social networks do not simply induce young people and students to participate in volunteer activities aiding children after the beginning of the 2000s.

Table 7 displays the percentages of individuals who participated in volunteer activities aiding the elderly and children in Japan from 2000 to 2001, from 2005 to 2006, and from 2010 to 2011. While the percentages of individuals who participated in volunteer activities aiding the elderly have declined since the beginning of the 2000s, the percentages of volunteers aiding children have risen during the same period. These trends enable us to surmise that there have been no news stimuli for volunteering with the elderly since the beginning of the 2000s. Hence, the determinant of participation in volunteer activities aiding the elderly has been maintained during the period. Contrariwise, we posit that there are new stimuli for people working with children since the middle of the 2000s, as participation in volunteer activities aiding children has been expanding. Because the state of volunteer activity in Japan is evolving, it is difficult to identify determinants of participation in volunteer activities aiding children after the beginning of the 2000s.

## V. Conclusion

This study attempts to identify determinants of participation in volunteer activities conducted from 2000 to 2001 and from 2005 to 2006. These two periods share with the period from 2010 to 2011 the determinant of volunteers aiding the elderly. Ruralism has positively influenced participation in volunteer activities aiding the elderly since the beginning of the 2000s. We identified inducements to participation in volunteer activities aiding children

in 2000 and 2001. Whereas a high percentage of housewives/househusbands and a high degree of urbanism negatively affects fifteen-year-old or older individuals' participation in volunteer activities aiding children, firm social networks are the positive determinant of fifteen-to-twenty-four-year-old volunteers and student volunteers aiding children. This study did not identify determinants of participation in volunteer activities aiding children in 2005 and 2006.

The percentage of individuals who participate in volunteer activities aiding the elderly has diminished since the beginning of the 2000s. The determinant of volunteers aiding the elderly, ruralism, continues to be significant since the beginning of the 2000s. These circumstances allow us to consider that fresh inducements to volunteer activities aiding the elderly have not arisen.

We presume that novel stimuli to participation in volunteer activities aiding children have occurred. The new stimuli have brought about the shifts in determinants of participation in volunteer activities aiding children and the percentage of volunteers aiding children.

Volunteer activities aiding the elderly require novel systems to secure more cooperators. Activities that depend on mutual aid, which rural areas enjoy in neighborhoods or communities, will gradually lose volunteers. Japan must not only maintain conventional mutual aid in rural areas but also seek means to entice community members to engage in volunteer activities in urban and suburban areas.

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Table 1. Dependent Variables for Multiple Linear Regression Analysis

Dependent Variable	Source	Year of Survey	Mean	Standard Deviation	
Percentage of individuals who have participated in a volunteer activity aiding the elderly for the past year in the population aged fifteen years or older	Sōmu shō. ed. <i>Heisei 13 nen shakai seikatsu kihon chōsa hōkoku.</i> (October 20, 2001)	2001	5.5	1.16	
		2006	4.8	0.95	
Percentage of individuals who have participated in a volunteer activity aiding the elderly for the past year in the population aged fifteen to twenty-four years		2001	5.3	2.04	
		2006	4.6	1.49	
Percentage of individuals who have participated in a volunteer activity aiding the elderly for the past year in the population aged sixty-five years or older		2001	8.0	1.83	
		2006	8.0	1.65	
Percentage of individuals who have participated in a volunteer activity aiding the elderly for the past year in the population aged sixty-five to seventy-four years		2001	9.3	2.60	
		2006	9.6	2.40	
Percentage of individuals who have participated in a volunteer activity aiding the elderly for the past year in the population aged seventy-five years or older		Sōmu shō. ed. <i>Heisei 18 nen shakai seikatsu kihon chōsa hōkoku.</i> (October 20, 2006)	2001	5.9	1.81
		2006	6.2	1.65	
Percentage of individuals who have participated in a volunteer activity aiding the elderly for the past year in students aged fifteen years or older		Sōmu shō. ed. <i>Heisei 18 nen shakai seikatsu kihon chōsa hōkoku.</i> (October 20, 2006)	2001	7.0	2.81
			2006	6.3	2.20
Percentage of individuals who have participated in a volunteer activity aiding children for the past year in the population aged fifteen years or older			2001	5.7	0.91
			2006	6.0	0.96
Percentage of individuals who have participated in a volunteer activity aiding children for the past year in the population aged fifteen to twenty-four years	2001		4.2	1.28	
	2006		4.5	1.46	

Percentage of individuals who have participated in a volunteer activity aiding children for the past year in the population aged sixty-five years or older	2001	2.2	0.91
	2006	3.4	1.03
Percentage of individuals who have participated in a volunteer activity aiding children for the past year in the population aged sixty-five to seventy-four years	2001	3.0	1.07
	2006	4.7	1.43
Percentage of individuals who have participated in a volunteer activity aiding children for the past year in the population aged seventy-five years or older	2001	1.4	0.77
	2006	1.9	1.05
Percentage of individuals who have participated in a volunteer activity aiding children for the past year in students aged fifteen years or older	2001	5.2	1.95
	2006	5.3	2.10

Table 2. Variables for Principal Component Analysis

Variable		Source	Mean	Standard Deviation
The elderly and children	Percentage of elderly people in the population	Population aged sixty-five years and older: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2001: 19.8	FY 2001: 2.9
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 22.5	FY 2006: 2.7
	Percentage of children in the population	Population aged nineteen years and younger: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2001: 20.6	FY 2001: 1.4
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 19.0	FY 2006: 1.2
	Average number of elderly people in a municipality	Population aged sixty-five years and older: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2001: 7,484	FY 2001: 6,892
		The number of municipalities: Seifu tōkei no sōgō madoguchi. [ <a href="https://www.e-stat.go.jp/SG1/hyoujun/initialize.do">https://www.e-stat.go.jp/SG1/hyoujun/initialize.do</a> ] (October 1, 2001 and 2006)	FY 2006: 14,677	FY 2006: 8,657
	Average number of children in a municipality	Population aged nineteen years and younger: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2001: 8,417	FY 2001: 8,761
		The number of municipalities: Seifu tōkei no sōgō madoguchi. [ <a href="https://www.e-stat.go.jp/SG1/hyoujun/initialize.do">https://www.e-stat.go.jp/SG1/hyoujun/initialize.do</a> ] (October 1, 2001 and 2006)	FY 2006: 12,883	FY 2006: 8,569

Variable		Source	Mean	Standard Deviation
The elderly and children	Density of elderly population (per square kilometer)	Population aged sixty-five years and older: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2001: 112.1	FY 2001: 174.9
		Area: Kokudokōtsū shō. <i>Zenkoku todōfuken shikuchōson betsu menseki shirabe</i> . (October 1, 2001 and 2006)	FY 2006: 134.0	FY 2006: 215.7
	Density of children in the population (per square kilometer)	Population aged nineteen years and younger: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2001: 129.7	FY 2001: 205.9
		Area: Kokudokōtsū shō. <i>Zenkoku todōfuken shikuchōson betsu menseki shirabe</i> . (October 1, 2001 and 2006)	FY 2006: 123.1	FY 2006: 199.0
Financial conditions of prefectural and municipal governments	Prefectural taxes per capita (yen)	Prefectural taxes: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 114,374	FY 2001: 39,567
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 115,953	FY 2006: 43,816
	Prefectural general revenue resources (prefectural taxes, prefectural transfer tax, and prefectural allocation tax) per capita (yen)	Prefectural taxes, prefectural transfer tax, and prefectural allocation tax: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 250,168	FY 2001: 59,232
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 243,539	FY 2006: 52,521

Variable		Source	Mean	Standard Deviation
Financial conditions of prefectural and municipal governments	Prefectural bonds per capita (yen)	Prefectural bonds: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 66,682	FY 2001: 29,469
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 55,548	FY 2006: 20,631
	Prefectural elderly welfare expenses (classified by purpose) per capita (yen)	Prefectural elderly welfare expenses classified by purpose: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 15,214	FY 2001: 3,576
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 17,105	FY 2006: 3,392
	Prefectural child welfare expenses (classified by purpose) per capita (yen)	Prefectural child welfare expenses classified by purpose: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 11,112	FY 2001: 3,114
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 8,636	FY 2006: 2,585
	Prefectural debt service (classified by purpose) per capita (yen)	Prefectural debt service classified by purpose: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 64,037	FY 2001: 24,515
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 65,396	FY 2006: 24,389

Variable		Source	Mean	Standard Deviation
Financial conditions of prefectural and municipal governments	Municipal taxes per capita (yen)	Municipal taxes: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 131,162	FY 2001: 24,168
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 130,514	FY 2006: 22,803
	Municipal general revenue resources (municipal taxes, municipal transfer tax, and municipal allocation tax) per capita (yen)	Municipal taxes, municipal transfer tax, and municipal allocation tax: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 237,630	FY 2001: 31,972
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 227,970	FY 2006: 30,100
	Municipal bonds per capita (yen)	Municipal bonds: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 49,191	FY 2001: 16,834
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 39,613	FY 2006: 11,089
Municipal elderly welfare expenses (classified by purpose) per capita (yen)	Municipal elderly welfare expenses classified by purpose: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 21,435	FY 2001: 4,409	
	Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 22,457	FY 2006: 4,132	



Variable		Source	Mean	Standard Deviation
Financial conditions of prefectural and municipal governments	Municipal child welfare expenses (classified by purpose) per capita (yen)	Municipal child welfare expenses classified by purpose: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 27,714	FY 2001: 5,363
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 35,345	FY 2006: 5,109
	Municipal debt service (classified by purpose) per capita (yen)	Municipal debt service classified by purpose: Chihō zaisei chōsa kenkyūkai. ed. <i>Chihō zaisei tōkei nempō</i> . (FYs 2001 and 2006)	FY 2001: 56,660	FY 2001: 13,832
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 58,076	FY 2006: 16,130
	Outstanding prefectural and municipal bonds per capita (yen)	Outstanding prefectural and municipal bonds: Asahi shimbunsha/Asahi shimbun shuppan. ed. <i>Minryoku</i> . (March 31, 2002 and 2007)	FY 2001: 1,127,868	FY 2001: 287,166
		Population: Sōmu shō. ed. <i>Jinkō suihei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 1,158,665	FY 2006: 293,293
Social network	Average number of family members	Population: Kokudo chiri kyōkai. <i>Jūmin kihon daichō jinkō yōran</i> . (March 31, 2002 and 2007)	FY 2001: 2.8	FY 2001: 0.2
		The number of households: Kokudo chiri kyōkai. <i>Jūmin kihon daichō jinkō yōran</i> . (March 31, 2002 and 2007)	FY 2006: 2.6	FY 2006: 0.2

Variable		Source	Mean	Standard Deviation
Social network	Percentage of individuals who moved in and moved out in the population	The number of individuals who moved in within the prefecture, who moved out within the prefecture, who moved in from other prefectures or other countries, and who moved out to other prefectures or other countries: Sōmu shō. ed. <i>Jūmin kihon daichō jinkō idō hōkoku nempō</i> . (April to December, 2001 and 2006. January to March, 2002 and 2007)	FY 2001: 8.4 FY 2006: 7.5	FY 2001: 1.7 FY 2006: 1.7
		Population: Kokudo chiri kyōkai. <i>Jūmin kihon daichō jinkō yōran</i> . (March 31, 2002 and 2007)		
	Percentage of households owning their houses in all the households	The number of households living in their own houses: Sōmu shō. ed. <i>Kokusei chōsa hōkoku</i> . (October 1, 2000 and 2005)	FY 2000: 68.9	FY 2000: 7.3
		The number of all the households: Sōmu shō. ed. <i>Kokusei chōsa hōkoku</i> . (October 1, 2000 and 2005)	FY 2005: 66.0	FY 2005: 6.6
	Percentage of self-employed individuals, family workers, and pieceworkers at home in the population	The number of self-employed individuals, family workers, and pieceworkers at home: Sōmu shō. ed. <i>Kokusei chōsa hōkoku</i> . (October 1, 2000 and 2005)	FY 2000: 11.8	FY 2000: 1.8
		Population: Sōmu shō. ed. <i>Kokusei chōsa hōkoku</i> . (October 1, 2000 and 2005)	FY 2005: 8.8	FY 2005: 1.7

Variable		Source	Mean	Standard Deviation
Social network	Percentage of housewives and house-husbands in the population	The number of housewives and househusbands: Sōmu shō. ed. <i>Kokusei chōsa hōkoku</i> . (October 1, 2000 and 2005)	FY 2000: 15.2	FY 2000: 1.4
		Population: Sōmu shō. ed. <i>Kokusei chōsa hōkoku</i> . (October 1, 2000 and 2005)	FY 2005: 13.4	FY 2005: 1.2
	Percentage of children attending kindergartens in the population	The number of children attending kindergartens: Mombukagaku shō. <i>Gakkō kihon chōsa hōkokusho</i> . (May 1, 2001 and 2006)	FY 2001: 1.2	FY 2001: 0.3
		Population: Sōmu shō. ed. <i>Jinkō suiikei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 1.2	FY 2006: 0.3
Community welfare	Commissioned welfare volunteers per 10,000 residents	The number of commissioned welfare volunteers: Kōseirōdō shō. ed. <i>Shakai fukushi gyōsei gyōmu hōkoku</i> . (March 31, 2002 and 2007)	FY 2001: 21.1	FY 2001: 4.6
		Population: Sōmu shō. ed. <i>Jinkō suiikei nempō</i> . (October 1, 2001 and 2006)	FY 2006: 21.4	FY 2006: 4.8

Variable		Source	Mean	Standard Deviation
Community welfare	Municipal councils of social welfare (excluding prefectural councils of social welfare and social welfare councils of government ordinance designated cities) per one million residents	The number of all the councils of social welfare: Kōseirōdō shō. ed. <i>Shakai fukushi gyōsei gyōmu hōkoku.</i> (FYs 2001 and 2006)		
		The number of ordinance designated cities: Seifu tōkei no sōgō madoguchi. [https://www.e-stat.go.jp/SG1/hyoujun/initialize.do] (October 1, 2001 and 2006)	FY 2001: 38.2 FY 2006: 20.1	FY 2001: 16.9 FY 2006: 8.8
		Population: Sōmu shō. ed. <i>Jinkō suikei nempō.</i> (October 1, 2001 and 2006)		

Table 3. Eigenvalues of Principal Components

2000–2001						
Component	Initial Eigenvalue			Extraction Sum of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.502	50.007	50.007	13.502	50.007	50.007
2	4.164	15.421	65.428	4.164	15.421	65.428
3	2.420	8.961	74.389	2.420	8.961	74.389
4	1.822	6.748	81.137	1.822	6.748	81.137
5	1.259	4.662	85.799	1.259	4.662	85.799
6	.724	2.680	88.479			
7	.608	2.251	90.731			
8	.564	2.090	92.821			
9	.327	1.210	94.031			
10	.285	1.057	95.088			
11	.243	.901	95.989			
12	.204	.757	96.746			
13	.193	.713	97.459			
14	.142	.528	97.987			
15	.115	.425	98.412			
16	.091	.337	98.748			
17	.079	.294	99.042			
18	.056	.207	99.248			
19	.043	.160	99.409			
20	.040	.147	99.556			
21	.033	.123	99.679			
22	.031	.115	99.794			
23	.029	.106	99.900			
24	.015	.054	99.954			
25	.011	.040	99.994			
26	.001	.005	100.000			
27	.000	.000	100.000			

2005-2006						
Component	Initial Eigenvalue			Extraction Sum of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.079	52.143	52.143	14.079	52.143	52.143
2	3.770	13.964	66.108	3.770	13.964	66.108
3	2.466	9.134	75.242	2.466	9.134	75.242
4	1.862	6.897	82.139	1.862	6.897	82.139
5	1.307	4.840	86.979	1.307	4.840	86.979
6	.582	2.154	89.133			
7	.569	2.107	91.240			
8	.441	1.634	92.874			
9	.428	1.587	94.461			
10	.297	1.101	95.562			
11	.251	.929	96.491			
12	.184	.680	97.171			
13	.162	.599	97.769			
14	.123	.457	98.226			
15	.096	.354	98.581			
16	.075	.278	98.859			
17	.064	.238	99.097			
18	.055	.202	99.299			
19	.049	.182	99.481			
20	.044	.161	99.642			
21	.030	.113	99.755			
22	.025	.093	99.848			
23	.021	.076	99.925			
24	.011	.041	99.965			
25	.008	.029	99.994			
26	.001	.005	99.999			
27	.000	.001	100.000			

Table 4. Principal Component Loadings

2000–2001					
Variable	Component				
	1	2	3	4	5
Percentage of elderly people	.883	.147	-.057	.174	-.267
Percentage of children	.138	-.501	.232	-.653	.327
Elderly people per municipality	-.754	.547	.021	.209	.072
Children per municipality	-.795	.450	-.022	.169	.146
Density of elderly population	-.698	.643	.190	.101	-.022
Density of children in the population	-.744	.577	.138	.085	.050
Prefectural taxes	-.431	.536	.500	.238	-.231
Prefectural general revenue resources	.766	.436	.359	.011	-.177
Prefectural bonds	.859	.185	-.058	.081	.000
Prefectural elderly welfare expenses	.727	.493	.259	-.111	-.168
Prefectural child welfare expenses	.631	.350	.396	-.441	.043
Prefectural debt service	.845	.271	.066	-.031	-.021
Municipal taxes	-.636	-.119	-.140	.576	.220
Municipal general revenue resources	.856	.030	-.395	.120	.177
Municipal bonds	.750	.291	-.329	-.026	.363
Municipal elderly welfare expenses	.772	.417	-.186	.076	-.273
Municipal child welfare expenses	.393	.504	.418	.046	.475
Municipal debt service	.778	.265	-.449	.062	.246
Outstanding prefectural and municipal bonds	.829	.369	-.245	.118	.151
Family members	.358	-.643	.422	.346	.137
Change of residence	-.609	.459	-.203	-.446	.107
Owned homes	.642	-.447	.144	.496	-.034
Self-employed individuals	.542	-.175	.391	-.064	-.266
Housewives/househusbands	-.278	.220	-.709	-.129	-.340
Kindergartners	-.754	-.229	-.161	-.174	-.319
Commissioned welfare volunteers	.935	-.049	-.145	.085	-.101
Municipal councils of social welfare	.919	-.008	.015	-.101	-.111

2005-2006					
Variable	Component				
	1	2	3	4	5
Percentage of elderly people	.871	.191	.215	.180	-.207
Percentage of children	-.047	-.561	-.453	-.440	.356
Elderly people per municipality	-.729	.494	.230	.253	.180
Children per municipality	-.812	.382	.188	.173	.242
Density of elderly population	-.691	.634	-.149	.116	-.018
Density of children in the population	-.729	.577	-.130	.080	.034
Prefectural taxes	-.495	.554	-.382	.338	-.183
Prefectural general revenue resources	.651	.560	-.387	.120	-.170
Prefectural bonds	.907	.096	.032	.141	.082
Prefectural elderly welfare expenses	.836	.395	.064	-.008	-.070
Prefectural child welfare expenses	.623	.271	-.560	-.102	-.134
Prefectural debt service	.855	.368	-.120	.137	-.043
Municipal taxes	-.688	-.093	.271	.397	.315
Municipal general revenue resources	.877	.101	.355	-.098	.182
Municipal bonds	.772	.132	.309	-.180	.379
Municipal elderly welfare expenses	.824	.319	.200	-.006	-.179
Municipal child welfare expenses	.355	.475	-.470	-.039	.533
Municipal debt service	.786	.248	.357	-.227	.197
Outstanding prefectural and municipal bonds	.824	.308	.298	.028	.234
Family members	.347	-.606	-.273	.515	.201
Change of residence	-.661	.347	-.060	-.587	-.011
Owned homes	.616	-.448	.093	.556	-.066
Self-employed individuals	.838	-.079	-.224	.099	-.176
Housewives/househusbands	-.404	.156	.679	-.168	-.261
Kindergartners	-.785	-.216	.131	-.092	-.293
Commissioned welfare volunteers	.935	-.036	.181	.010	-.061
Municipal councils of social welfare	.760	-.108	-.196	-.353	-.173



Table 5. Multiple Linear Regression Models

Dependent Variable	2000–2001		2005–2006	
	Adjusted R-Square	Significance Probability for ANOVA	Adjusted R-Square	Significance Probability for ANOVA
Individuals aged fifteen years or older aiding the elderly	.300	.001	.220	.009
Individuals aged fifteen to twenty-four years aiding the elderly	.086	.122	.116	.072
Individuals aged sixty-five years or older aiding the elderly	.079	.137	.022	.321
Individuals aged sixty-five to seventy-four years aiding the elderly	.104	.089	.031	.284
Individuals aged seventy-five years or older aiding the elderly	.026	.307	-.025	.575
Students aiding the elderly	.093	.108	.072	.154
Individuals aged fifteen years or older aiding children	.147	.040	.015	.353
Individuals aged fifteen to twenty-four years aiding children	.173	.024	-.041	.672
Individuals aged sixty-five years or older aiding children	-.038	.651	-.025	.572
Individuals aged sixty-five to seventy-four years aiding children	.006	.400	-.059	.785
Individuals aged seventy-five years or older aiding children	-.016	.521	-.014	.507
Students aiding children	.227	.007	-.020	.541

Table 6. Coefficients of Linear Regression Equations Significant at the 5% Level

Period	Dependent Variable	Independent Variable	Unstandardized Coefficient		Standardized Coefficient	t-value	Significance Probability
			B	Std. Error	Beta		
2000-2001	Individuals aged fifteen years or older aiding the elderly	(Constant)	5.453	.144		37.986	.000
		PC1	.689	.145	.586	4.752	.000
		PC2	-.037	.145	-.032	-.256	.799
		PC3	-.004	.145	-.004	-.030	.976
		PC4	-.207	.145	-.176	-1.428	.161
		PC5	-.018	.145	-.016	-.126	.900
	Individuals aged fifteen years or older aiding children	(Constant)	5.732	.125		46.024	.000
		PC1	.182	.126	.196	1.442	.157
		PC2	-.308	.126	-.334	-2.449	.019
		PC3	.271	.126	.293	2.151	.037
		PC4	.038	.126	.041	.302	.764
		PC5	.043	.126	.046	.338	.737
	Individuals aged fifteen to twenty-four years aiding children	(Constant)	4.213	.172		24.520	.000
		PC1	.212	.174	.164	1.222	.229
		PC2	.037	.174	.029	.216	.830
		PC3	.426	.174	.329	2.451	.019
		PC4	.444	.174	.343	2.557	.014
		PC5	.129	.174	.100	.745	.461
	Students aiding children	(Constant)	5.247	.253		20.734	.000
		PC1	.365	.256	.185	1.426	.161
		PC2	-.004	.256	-.002	-.017	.987
PC3		.769	.256	.390	3.006	.005	
PC4		.693	.256	.351	2.710	.010	
PC5		.078	.256	.039	.305	.762	

Period	Dependent Variable	Independent Variable	Unstandardized Coefficient		Standardized Coefficient	t-value	Significance Probability
			B	Std. Error	Beta		
2005–2006	Individuals aged fifteen years or older aiding the elderly	(Constant)	4.796	.123		38.917	.000
		PC1	.499	.125	.521	4.002	.000
		PC2	-.016	.125	-.016	-.125	.901
		PC3	.098	.125	.102	.784	.438
		PC4	.017	.125	.018	.135	.893
		PC5	.143	.125	.150	1.149	.257

Table 7. Percentages of Individuals Participating in Volunteer Activities Aiding the Elderly and Children in Japan

	2000–2001		2005–2006		2010–2011	
	The elderly	Children	The elderly	Children	The elderly	Children
Individuals aged ten/fifteen years or older	4.9	5.4	4.4	5.8	3.7	8.2
Individuals aged fifteen to twenty-four years	4.8	4.1	4.0	4.4	3.0	6.1
Students	6.4	5.1	5.5	4.9	3.5	7.5