The Influence of Social Networks on Prefectural and Municipal Government Welfare Programs since 1989

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Abstract

This paper aims to reveal social networks' influence on prefectural and municipal expenditures on welfare for seniors and children. Multiple regression analysis was conducted using principal component scores as the independent variables. The principal component analysis employed variables concerning social networks, the number of seniors and children, prefectural and municipal governments' finances, and community welfare. A multiple regression analysis using prefectural and municipal expenses for welfare programs as its independent variables revealed that social networks cannot substitute for prefectural and municipal governments in supplying welfare services, and that social networks may induce greater prefectural and municipal expenditures on welfare programs.

I. Introduction

Scholars have explained Japan's welfare regime from the period beginning immediately after the end of the Second World War ending before the 1990s. A welfare regime is a pattern of welfare-service providers (Esping-Andersen 1999, 34–35; Miyamoto 2008, 13; Shinkawa 2011a, 11). The central government, local governments, markets, local communities, and families can all supply welfare services to people. The patterns of welfare regimes vary according to which welfare providers have major roles in aiding those people who require welfare services. Many of them share views on the factors characterizing Japan's welfare regime before the 1990s.

The era beginning immediately after the end of the World War II witnessed the enactment of basic welfare laws, such as the Public Assistance Act (*Seikatsu hogo hō*, 1946, entirely revised in 1950), the Child Welfare Act (*Jidō fukushi hō*, 1947), and the Physically Disabled Persons Welfare Act

(*Shintai shōgaisha fukushi hō*, 1949). The Six Welfare Acts System (*Fukushi roppō taisei*) was established after the Intellectually Disabled Persons Welfare Act (*Seishin hakujakusha fukushi hō*, 1960), the Elderly Welfare Act (*Rōjin fukushi hō*, 1963), and the Maternal and Child Welfare Act (*Boshi fukushi hō*, 1964) were each enacted.

A period of expanding welfare services followed the era of the Six Welfare Acts System. The high economic growth that started in the mid-1950s altered societies in Japan. Many young people relocated from rural areas to urban areas in order to become workers in the secondary industry. While urban areas required welfare programs for children, rural areas demanded welfare programs for the elderly. The high economic growth brought about increased tax revenues for the central government. In the 1960s, the central government, as well as prefectural and local governments, increased their expenditures on welfare programs.

In the 1970s, during a period of slow economic growth, the central government examined the retrenchment of its welfare programs. As their rising tax revenues slowed in this era, the central government considered minimizing the expenses rising from welfare programs.

The 1980s were a period of administrative reform. The central governments opted to retrench its expenditures rather than to increase taxes in order to rebuild its finances. The central government examined a large-scale reduction of its expenditures. Administrative reforms influenced the central government's welfare programs.

Many scholars focus on these occurrences when explaining Japan's welfare regime from the mid-1940s to the 1980s. What are the focal points that can be found for understanding Japan's welfare regime since the 1990s?

Miyamoto (2008, 144–49 and 151–57) described two courses pursued by the welfare regime of Japan since the mid-1990s. One course is the retrenchment of the central government's expenditures for welfare programs. Both the pension and the health-insurance systems employed reductions on payment and increases in insurance premiums. The second course is the universalization of welfare programs. The central government of this period was not presumed to provide welfare services for people in specific social stratums; rather, it is assumed that welfare services are sup-

plied to many people belonging to various categories. Examples of this strategy are the enactments of the Long-Term Care Insurance Act (*Kaigo hoken hō*) in 1997 and the Social Welfare Act in 2000. While the former aims to expand the users of welfare services for the elderly, the latter intends to promote the entry of various welfare service providers into the market while retaining a certain level of welfare-service quality.

Shinkawa (2009, 56–57; 2011b, 88–89) explained how the 1990s retained the retrenchment of the welfare system that appeared in the 1980s, and how, in the 1990s, the welfare regime became less focused on the family. The central government adopted an expansion of welfare services for the elderly and for parents raising children. The increase in female workers also led to the promotion of the socialization of care for both seniors and children. Reforms implemented by the cabinet of Prime Minister Junichirō Koizumi in the 2000s brought about the liberalization of the welfare regime.

Shinkawa (2007, 64–65 and 67; 2011c, 170–76) explained that Japan's welfare regime has proceeded toward liberalization both during and after the 1990s. This period saw the enrichment of public welfare programs for the elderly and for parents who were raising children. The central government formed the Gold Plan, the New Gold Plan, and the Gold Plan 21, each of which aimed to secure the necessary manpower and facilities for elderly welfare in 1989, 1994, and 1999, respectively. The central government has furthered the welfare system for the elderly through these plans. The central government also started the Long-Term Care Insurance System (*Kaigo hoken seido*) for welfare services for the elderly in 2000. The central government established the Angel Plan, the New Angel Plan, and Child and Childrearing Support Plan, the purposes of which were to enhance childrearing services, in 1994, 1999, and 2004, respectively. These endeavors brought about an increase in the central government's expenditure for welfare programs for the elderly and parents raising children. However, Shinkawa pointed out that Japan's expenses for social security for the elderly and parents raising children are less than those of other advanced countries, and that government efforts since about 1990 have not proceeded against neoliberalism, which was employed by the central government in the 1980s.

Itō (2008, 5 and 7–9) explained that marketization of welfare has rapidly proceeded since the 1990s. Examples of this marketization include the introduction of the Long-Term Care Insurance System, the start of the contract system for the utilization of day nurseries (*hoikusho*), and increases in pension premiums and payments for medical treatments. Itō furthermore pointed out that families have lost their function as a welfare provider. The welfare regime had approached the liberalized welfare regime of the United States.

Kitayama and Jōshita (2013, 352–53) pointed out that, although the central government's plans such as the Gold Plan after about 1990 were aimed at expanding welfare services, limited financial resources forced the central government to retrench its expenditures for welfare programs. The central government also decided to increase the burden of annuity and health insurance on its citizens. The Long-Term Care Insurance System, which started in 2000, aimed to decrease medical expenses. These circumstances do not explain how Japan has experienced the enhanced welfare programs provided by the central government since 1990.

These studies of Japan's welfare regime since 1990 focus on the central government. The purpose of this paper is to reveal the influence of social networks on prefectural and municipal government expenditure on welfare programs since around 1990. The present paper employs a viewpoint that is different from that of the previous studies. Its two sub-purposes are: (1) to examine how social networks concerned with welfare are constructed and (2) to reveal the relations between social networks and the prefectural and municipal government expenditures on welfare programs by cross-section analysis. This paper employs public expenditures on welfare programs for the elderly and children in order to conduct a detailed analysis of the relations between social networks and welfare.

II. Literature on social networks

This section outlines the literature on social networks as observed in Japan after about 1990. Social networks contain personal networks, which signify relations between an individual and other individuals. Facts revealed by the literature on social networks may be of use for the research design of

the present paper.

This section selects from previous studies on social networks of seniors and parents raising children because this paper examines the relation between social networks and public expenses on welfare programs for the elderly and children. It is presumed that an individual's neighbors provide welfare services through offering mutual aids among residents, and that an individual's social network, comprised of their neighbors, are substituted for prefectural and municipal governments. The following paragraphs clarify some features of social networks of seniors and parents raising children, as well as traits of social networks composed of neighbors.

Toyoshima (2011) examined the social networks of 20- to 75-year old residents in Usuki City, Ōita Prefecture. The residents' answers to Toyoshima's questionnaire showed a distinction between young adults and seniors in the frequency of their contact with their neighbors. Respondents in their twenties and thirties made fewer contacts than respondents in their sixties and seventies (Toyoshima 2011, 106).

Koyama (2012) investigated the social networks of residents in Setagaya Ward, Tōkyō Metropolis. The residents, aged 20 to 74 years, answered questionnaires. One question asked about the number of neighbors with whom the respondents were in contact. The answers to this question were presented by age brackets. Of the five age groups, residents whose age was below 35 years had the fewest average number of close neighbors. Individuals who were 65 years or older were in contact with the most neighbors (Koyama 2012, 11).

Ōtsuki (2004) investigated the networks of residents in a central part of Kyōto City. One of his findings was that the networks of residents who were between 20 and 39 years old tended to include fewer neighbors than the networks of residents who were 65 years and older (Ōtsuki 2004, 147).

A study conducted by Sugano (2008) revealed how frequently individuals invited others to their houses, and whom they invited, by using answers from survey respondents across Japan. It is worth noting the answers concerning how frequently the respondents invited their neighbors to their homes. Respondents in their 60s tended to invite their neighbors to their homes more frequently than respondents in their 20s and 30s (Sugano 2008,

130).

These studies demonstrate that the elderly are more frequently in contact with more neighbors compared to young adults. This implies that the elderly are in contact with more neighbors, more frequently, than parents raising children.

A study revealed that neighbors are more important to the elderly than relatives of the elderly. Maeda (2006) examined the networks of seniors residing in the Tōkyō Metropolis. Maeda pointed out that the network of an elderly individual contains more neighbors than relatives on average. Namely, contacts with neighbors are important even for those elderly living in urban areas, which seem to have impacted traditional communities (Maeda 2006, 183). The frequency of elderly individuals' contact with their neighbors is higher than that of their contact with their friends, relatives, or children who do not reside with them at their homes (Maeda 2006, 184). Another study found that frequent contact with neighbors satisfied the elderly residing in Ōmiya Town, Mie Prefecture (Nakazato 2001, 83–84).

Literature on the social networks of parents who are raising children is examined in the following paragraphs. Kim (2011) examined the networks of Japanese and South Korean mothers whose children were between three and six years old. The questionnaires were designed to learn more about the people with whom mothers discussed childrearing. While 27.3% of the Japanese respondents answered that they discussed childrearing with their neighbors, 37.5% of the South Korean respondents received advice about childrearing from their neighbors. Among the Japanese respondents, 54.5% indicated that they became acquainted and had conversations with other mothers at their children's kindergartens (*yōchien*) or day nurseries, while 22.5% of the South Korean respondents indicated the same (Kim 2011, 121–23).

Tateyama (2011) examined the networks of mothers of children between the ages of three and five years who resided in Kanagawa Prefecture. The respondents indicated the sufficiency of the childrearing support they obtained from their parents, their husbands' parents, mothers with whom they were acquainted through their children, their neighbors, their friends, and their relatives. The help provided by the respondents' neighbors was

less substantial than the help provided by their parents, their husbands' parents, and other mothers with whom they were acquainted through their children's kindergartens or day nurseries (Tateyama 2011, 99).

Maeda (2003) examined the networks of mothers whose children attended kindergartens in Gifu City and one of its suburbs. The mothers were asked to identify up to four individuals with whom they associated. Family members and relatives were excluded from this group. The respondents also explained how they became acquainted with these individuals. The explanations were: because respondents and individuals attended the same schools (30.8%); because the respondents' children and the children of those individuals attended the same kindergarten, school, or course of accomplishments (*naraigoto*) (23.5%); because the children of respondents and the children of those individuals participated in activities in the same community (20.6%); because respondents and those individuals were connected through their work (14.2%); and because the individuals were the respondents' neighbors (4.3%) (Maeda 2003, 58). These research results indicate that mothers who are raising children tend to become intimate with the parents of the friends of their children rather than with their neighbors.

Tateyama (1998) analyzed the networks of married women living in all parts of Japan. The women indicated the number of neighbors whom they knew. It was found that, if the mothers were full-time housewives, self-employed workers, or the family of self-employed workers, they were close to many individuals in their neighborhood (Tateyama 1998, 26).

Manabe et al. (2011) presented the results of a survey of mothers' opinions of their neighbors. Subjects of the survey utilized a parenting salon (*kosodate saron*) in Kanazawa City. A parenting salon is a place where infants play and where their mothers can enjoy chatting with each other. Many of the survey subjects not only responded that they did not receive childrearing support from their communities, but also that they did not want assistance from their communities (Manabe et al. 2011, 57–58).

These studies imply that parents who are raising children do not, in contrast to the elderly, tend to rely on social networks that are comprised of their neighbors. Social networks that are formed in neighborhoods can, however, contribute to children's welfare, because the support provided by

neighbors for infants and their parents has expanded across the country since the 1990s. The present paper verifies whether social networks can influence prefectural and municipal expenditures on welfare programs, not only for the elderly but also for children.

Previous studies on social networks have revealed the conditions that promote the formation and reinforcement of social networks in neighborhoods. For example, Sugano's (2008) study, explained above, identified information concerning the number of family members. Individuals who had only one family member living with them were less likely to invite their neighbors to their homes than respondents who shared their homes with two or more family members (Sugano 2008, 134).

Yamashita (2003) analyzed social networks in Kurume City, Fukuoka Prefecture. One of his findings was that a resident who lived in the same place for a long time tended to have a network that contained many of their neighbors (Yamashita 2003, 178–79).

Hayashi (2000) examined the relation between migration and residents' networks in four large municipalities and three provincial municipalities. One of the results of his analysis was that a resident who lived in a certain place for a long time tended to know many of the individuals residing in their neighborhood (Hayashi 2000, 61–62).

Miura (1995) also investigated the relation between migration and social networks in Hōfu City, Yamaguchi Prefecture. Her results revealed that residents who owned homes were likely to be in contact with more neighbors than residents who rented (Miura 1995, 74–75).

Tanaka (2000) investigated the networks of self-employed individuals residing in Bunkyō Ward (Tōkyō Metropolis), Chōfu City (Tōkyō Metropolis), Fukuoka City, Niigata City, Fuji City (Shizuoka Prefecture), and Matsue City (Shimane Prefecture). The questionnaire asked about the number of friends that the respondents had in their own neighborhood. The results of this analysis revealed that self-employed individuals had the most friends in their neighborhood, compared to full-time and part-time employees (Tanaka 2000, 117–18). This finding indicates that areas in which many self-employed individuals live may enjoy solid and developed social networks.

One study examined the conditions for constructing and developing the social networks of parents who were raising children. Jitsukawa and Sunagami (2012, 189–90) explained that full-time housewives who were raising children and mothers whose children attended kindergartens were able to more easily develop networks among themselves compared to working mothers and mothers whose children go to day nurseries.

The present paper examines how prefectural and municipal government expenditures for welfare programs are influenced by the social networks of family members, residents living in a certain place for a long time, homeowners, self-employed individuals, housewives/househusbands, and parents of kindergartners.

III. Methodology

Multiple regression analysis is employed in order to reveal the relation between social networks and prefectural and municipal government expenditures for welfare programs. The analysis is conducted with data for each fiscal year (FY) from 1989 to 2010 using IBM SPSS 22.0. FY 1989 is the first fiscal year in the analysis because the Gold Plan, the central government's comprehensive and detailed plan for securing the manpower and facilities needed for elderly welfare, was announced in FY 1989.

The unit of analysis is the prefecture. Amendments to laws and the central government's plans for welfare programs for the elderly and children require not only municipal governments but also prefectural governments, to establish plans for procuring sufficient manpower and facilities for elderly and child welfare. If a small municipal government is confronted with difficulties in acquiring enough manpower and facilities, the prefectural government coordinates manpower and facilities in multiple municipal areas. While several municipal areas in a certain prefecture may possess disproportionate access to manpower and facilities, using the prefecture as the unit of analysis averages these disparities among municipal areas.

The dependent variables represent prefectural government expenditures on welfare programs for the elderly, municipal government expenditures on welfare programs for the elderly, prefectural and municipal government expenditures on welfare programs for the elderly, prefectural government

expenditures on welfare programs for children, municipal government expenditures on welfare programs for children, and prefectural and municipal government expenditures on welfare programs for children. All expenditures are divided by each prefecture's population. Table 1 shows the data sources for the prefectural and municipal government expenditures on programs for the elderly and children, as well as for the population data.

The independent variables represent the social networks of residents in their neighborhoods, the number of elderly individuals and children, the financial circumstances of the prefectural and municipal governments, and community welfare. The hypotheses used in this analysis are that prefectural and municipal governments expend more public money on welfare programs for the elderly and children if social networks are undeveloped in communities, if the number and percentage of seniors and children are high, if prefectural and municipal governments are in good financial condition, and if there are many semi-public/semi-private volunteers and organizations for community welfare.

Principal component analysis (PCA) creates independent variables for the multiple regression analysis by using variables that are concerned with social networks, the number of seniors and children, the finances of the prefectural and municipal governments, and community welfare. Table 2 displays the variables used for PCA. Hiromoto (2014, 650–53 and 658–65) minutely explained the variables and data for the variables.

Table 1. Data for Dependent Variables

Data	Source
Prefectural and Municipal Government Expenitures on Welfare Programs for the Elderly and Children (classified by purpose)	Chihō zaisei chōsa kenkyūkai. ed. 1989–2007. *Chihō zaisei tōkei nempō.* Sōmu-shō. 2008–2010. *Chihō zaisei tōkei nempō.* [http://www.soumu.go.jp/iken/zaisei/toukei.html]
Population	Sōmu-chō or Sōmu-shō. ed. 1990, 1995, 2000, 2005, and 2010. *Kokusei chōsa hōkoku.* Sōmu-shō. ed. 1989, 1991–1994, and 1996–1999. *Waga kuni no suikei jinkō.* Sōmu-shō. ed. 2001–2004 and 2006–2009. *Jinkō suikei, kokusei chōsa kekka ni yoru hokan hosei jinkō.*

Table 2. Variables for Principal Component Analysis

Group of Variables	Variable
Social Network	Family members
	Migration
	Owned homes
	The self-employed
	Housewives/househusbands
	Kindergartners
Number of Seniors and Children	Percentage of the elderly
	Percentage of children
	The elderly in a municipality
	Children in a municipality
	Density of elderly population
	Density of children
Prefectural and Municipal Finances	Prefectural taxes
	Prefectural general revenue
	Prefectural bonds
	Prefectural debt services
	Municipal taxes
	Municipal general revenue
	Municipal bonds
	Municipal debt services
	Balance of prefectural and municipal bonds
Community Welfare	Commissioned welfare volunteers
	Councils of social welfare

IV. Results

Table 3 indicates the results of the principal component analyses. The table holds principal components' eigenvalues with a numerical value of one or higher. Each FY has four or five principal components that possess eigenvalues with numerical values of one or higher. This paper focuses on PC1 (the first principal component) to PC4, because every FY between 1989 and 2010 has at least four principal components with eigenvalues of one or higher. Figures 1–4 show the loadings of PC1 to PC4. The loadings for FYs 1991 and 1992 in PC3 and for FYs 2009 and 2010 in PC4 are multiplied by -1 in order to obtain a uniform sign for variable loadings with absolute val-

Table 3.　Eigenvalues of Principal Components

Fiscal Year	Principal Component	Eigenvalue	Percent of Variance	Cumulative Percent	Fiscal Year	Principal Component	Eigenvalue	Percent of Variance	Cumulative Percent
1989	1	11.570	50.306	50.306	2001	1	12.007	52.204	52.204
	2	3.871	16.829	67.134		2	3.426	14.897	67.101
	3	2.688	11.689	78.823		3	2.060	8.956	76.057
	4	1.275	5.545	84.368		4	1.514	6.581	82.638
1990	1	12.041	52.353	52.353	2002	1	12.496	54.329	54.329
	2	3.754	16.324	68.676		2	3.366	14.634	68.963
	3	2.621	11.395	80.071		3	2.080	9.042	78.005
	4	1.211	5.263	85.334		4	1.494	6.494	84.499
1991	1	12.029	52.299	52.299	2003	1	12.589	54.735	54.735
	2	3.758	16.339	68.638		2	3.303	14.360	69.095
	3	2.535	11.022	79.660		3	2.108	9.163	78.258
	4	1.288	5.600	85.260		4	1.487	6.464	84.723
1992	1	11.603	50.446	50.446	2004	1	11.687	50.815	50.815
	2	3.943	17.144	67.591		2	3.220	13.999	64.814
	3	2.571	11.180	78.770		3	2.082	9.054	73.868
	4	1.354	5.888	84.658		4	1.757	7.640	81.507
1993	1	11.788	51.251	51.251		5	1.099	4.777	86.284
	2	3.877	16.857	68.108	2005	1	11.871	51.612	51.612
	3	2.478	10.774	78.882		2	3.318	14.427	66.039
	4	1.444	6.278	85.159		3	1.930	8.389	74.428
1994	1	12.060	52.433	52.433		4	1.746	7.589	82.017
	2	3.694	16.062	68.495		5	1.011	4.394	86.412
	3	2.306	10.027	78.522	2006	1	12.319	53.559	53.559
	4	1.420	6.172	84.694		2	3.238	14.078	67.638
1995	1	11.730	50.999	50.999		3	1.971	8.570	76.208
	2	3.678	15.991	66.990		4	1.808	7.861	84.068
	3	2.335	10.152	77.142	2007	1	11.944	51.932	51.932
	4	1.350	5.871	83.012		2	3.245	14.109	66.042
1996	1	12.053	52.403	52.403		3	2.072	9.010	75.052
	2	3.583	15.579	67.982		4	1.778	7.729	82.781
	3	2.267	9.857	77.838		5	1.118	4.861	87.642
	4	1.405	6.110	83.948	2008	1	12.303	53.490	53.490
1997	1	12.249	53.257	53.257		2	3.101	13.481	66.970
	2	3.548	15.428	68.685		3	2.014	8.757	75.727
	3	2.265	9.849	78.534		4	1.802	7.836	83.562
	4	1.395	6.067	84.601		5	1.066	4.635	88.197
1998	1	12.141	52.788	52.788	2009	1	12.582	54.703	54.703
	2	3.515	15.281	68.069		2	2.928	12.731	67.435
	3	2.233	9.710	77.779		3	2.047	8.902	76.336
	4	1.431	6.222	84.001		4	1.679	7.298	83.635
1999	1	12.176	52.940	52.940		5	1.146	4.982	88.617
	2	3.467	15.076	68.016	2010	1	12.473	54.229	54.229
	3	2.166	9.417	77.433		2	2.827	12.291	66.520
	4	1.402	6.097	83.530		3	2.074	9.016	75.536
2000	1	12.342	53.662	53.662		4	1.691	7.353	82.889
	2	3.520	15.304	68.966		5	1.214	5.278	88.167
	3	2.094	9.102	78.068					
	4	1.390	6.043	84.111					

ues that are relatively high from FY 1989 to FY 2010.

Figure 1 demonstrates that the scores for PC1 can be employed as a variable to represent ruralization. This variable will have a high number if

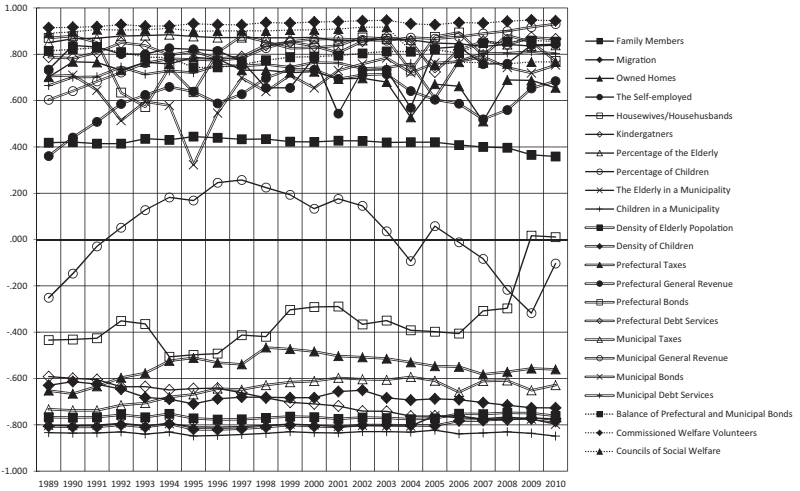
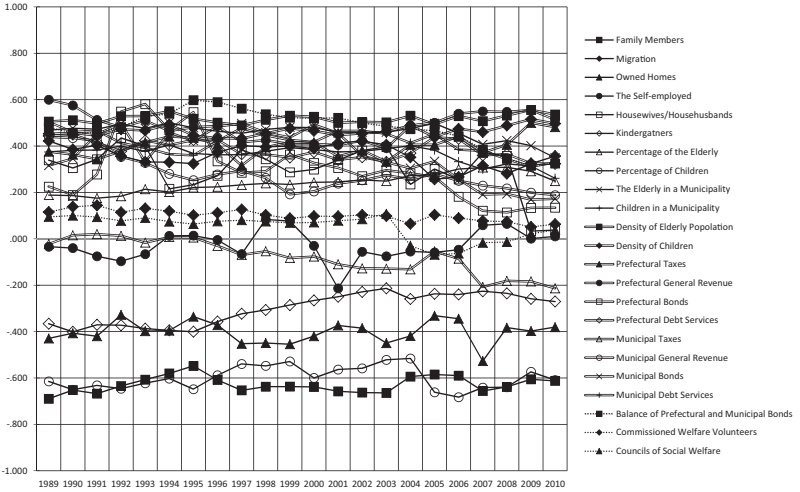


Figure 1. Component Loadings of PC1



Ficure 2. Component Loadings of PC2

social networks are substantial, if the number of seniors and children in a municipality or a certain area are on average low, if the financial situation of the prefectural and municipal governments is fragile, and if there are many

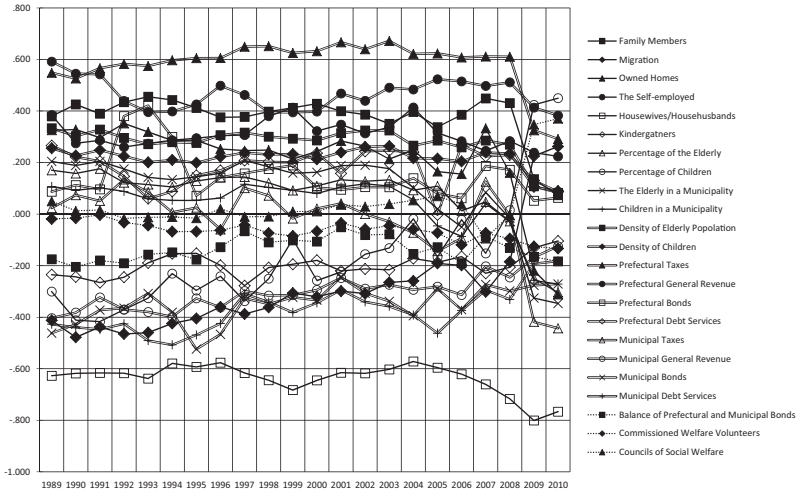


Figure 3.　Component Loadngs of PC3

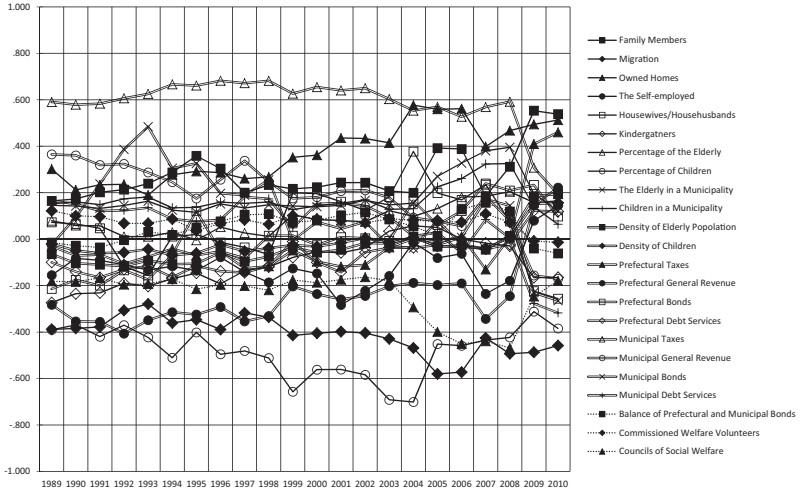


Figure 4.　Compoment Loadings of PC4

semi-public/semi-private individuals and organizations who contribute to community welfare. Figure 2 describes the meaning of PC2. The scores for PC2 are an indicator for urbanization. A high score for PC2 signifies that social networks are undeveloped and that the number of the elderly and children in a municipality or in a certain area are on average high. In Figure 3, high and positive component loadings of prefectural taxes and prefectural general revenue (*ippan zaigen*) are highlighted. A high score for PC3 signifies a healthy financial situation within a prefectural government. Component loadings of municipal taxes in PC4 are positive and relatively high. While absolute values for the component loadings of the municipal general

Table 4. Multiple Regression Model of Prefectural Expenditures on Welfare for Seniors

Fiscal Year	Adjusted R Square	Significance Probability
1989	.720	.000
1990	.811	.000
1991	.773	.000
1992	.769	.000
1993	.606	.000
1994	.650	.000
1995	.684	.000
1996	.735	.000
1997	.743	.000
1998	.646	.000
1999	.704	.000
2000	.757	.000
2001	.739	.000
2002	.758	.000
2003	.785	.000
2004	.746	.000
2005	.763	.000
2006	.775	.000
2007	.806	.000
2008	.797	.000
2009	.797	.000
2010	.811	.000

Table 5. Multiple Regression Model of Municipal Expenditures on Welfare for Seniors

Fiscal Year	Adjusted R Square	Significance Probability
1989	.707	.000
1990	.721	.000
1991	.732	.000
1992	.738	.000
1993	.836	.000
1994	.875	.000
1995	.899	.000
1996	.836	.000
1997	.837	.000
1998	.821	.000
1999	.838	.000
2000	.695	.000
2001	.734	.000
2002	.777	.000
2003	.776	.000
2004	.753	.000
2005	.751	.000
2006	.740	.000
2007	.775	.000
2008	.807	.000
2009	.805	.000
2010	.787	.000

revenue are medium, the component loadings are positive. Therefore, scores for PC4 can be regarded as representing that municipal governments are in a good financial situation.

Multiple regression analysis was conducted using the scores of PC1 to PC4 as independent variables. Tables 4–9 show the adjusted R squares and significance probabilities of the regression models that use prefectural government expenditures on elderly welfare, municipal government expenditures on elderly welfare, prefectural and municipal government expenditures on elderly welfare, prefectural government expenditures on child welfare,

Table 6. Multiple Regression Model of Prefectural and Municipal Expenditures on Welfare for Seniors

Fiscal Year	Adjusted R Square	Significance Probability
1989	.778	.000
1990	.830	.000
1991	.817	.000
1992	.840	.000
1993	.869	.000
1994	.862	.000
1995	.898	.000
1996	.858	.000
1997	.875	.000
1998	.842	.000
1999	.860	.000
2000	.776	.000
2001	.783	.000
2002	.810	.000
2003	.819	.000
2004	.792	.000
2005	.791	.000
2006	.792	.000
2007	.823	.000
2008	.824	.000
2009	.826	.000
2010	.815	.000

Table 7. Multiple Regression Model of Prefectural Expenditures on Welfare for Children

Fiscal Year	Adjusted R Square	Significance Probability
1989	.633	.000
1990	.729	.000
1991	.713	.000
1992	.729	.000
1993	.730	.000
1994	.646	.000
1995	.661	.000
1996	.698	.000
1997	.598	.000
1998	.622	.000
1999	.634	.000
2000	.659	.000
2001	.690	.000
2002	.688	.000
2003	.701	.000
2004	.627	.000
2005	.661	.000
2006	.650	.000
2007	.650	.000
2008	.646	.000
2009	.691	.000
2010	.702	.000

municipal government expenditures on child welfare, and prefectural and municipal government expenditures on child welfare as dependent variables. Every multiple regression analysis obtained regression equations significant at the five-percent level. Figures 5–10 plot the numerical values of standardized partial regression coefficients that are significant at the five-percent level.

Figures 5–7 illustrate the determinants of prefectural and municipal expenditures on elderly welfare. Prefectural government spending on elderly welfare is positively related with PC1, PC2, and PC3. Municipal governments'

Table 8. Multiple Regression Model of Municipal Expenditures on Welfare for Children

Fiscal Year	Adjusted R Square	Significance Probability
1989	.290	.001
1990	.287	.001
1991	.327	.000
1992	.327	.000
1993	.308	.001
1994	.351	.000
1995	.349	.000
1996	.389	.000
1997	.400	.000
1998	.367	.000
1999	.394	.000
2000	.333	.000
2001	.317	.000
2002	.317	.000
2003	.313	.000
2004	.354	.000
2005	.307	.001
2006	.298	.001
2007	.310	.001
2008	.337	.000
2009	.414	.000
2010	.360	.000

Table 9. Multiple Regression Model of Prefectural and Municipal Expenditures on Welfare for Children

Fiscal Year	Adjusted R Square	Significance Probability
1989	.471	.000
1990	.461	.000
1991	.495	.000
1992	.509	.000
1993	.474	.000
1994	.486	.000
1995	.477	.000
1996	.522	.000
1997	.497	.000
1998	.479	.000
1999	.547	.000
2000	.497	.000
2001	.491	.000
2002	.509	.000
2003	.532	.000
2004	.534	.000
2005	.523	.000
2006	.511	.000
2007	.482	.000
2008	.499	.000
2009	.602	.000
2010	.553	.000

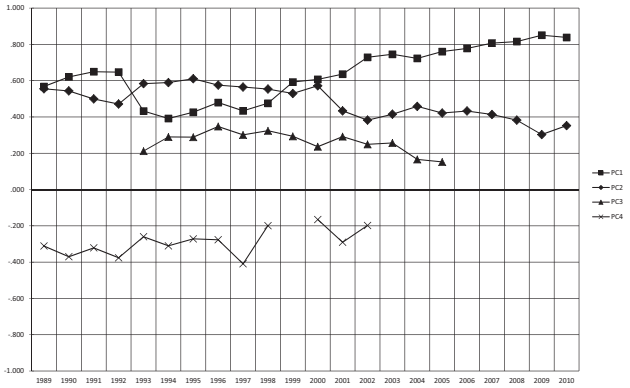


Figure 5.　Standardized Partial Regression Coefficients for Prefectural Expenditures on Welfare for Seniors

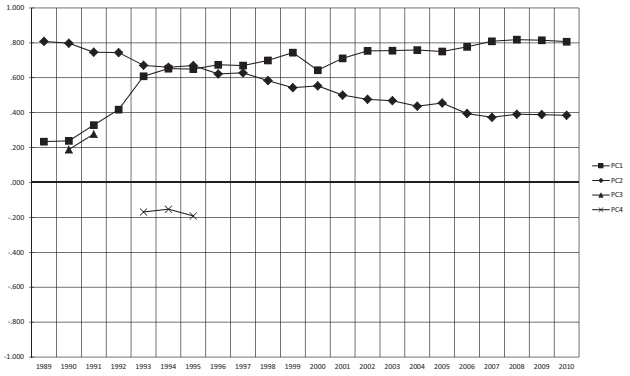


Figure 6.　Standardized Partial Regression Coefficients for Municipal Expenditures on Welfare for Seniors

expenses for elderly welfare are positively connected with PC1 and PC2. The prefectural and municipal governments' total expenditure on elderly welfare has positive links to PC1, PC2, and PC3.　Prefectural and municipal governments tend to expend public money on welfare programs for the elderly in rural and urban areas in the 1990s and the 2000s.　While the degree of urbanization is more related to the prefectural and municipal expenditures on elderly welfare than the degree of ruralization at the beginning of the 1990s, the importance of ruralization has gradually risen.　Although the

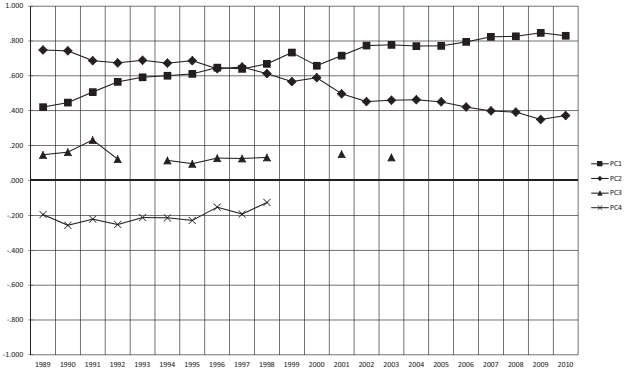


Figure 7. Standardized Partial Regression Coefficients for Prefectural and Municipal Expenditures on Welfare for Seniors

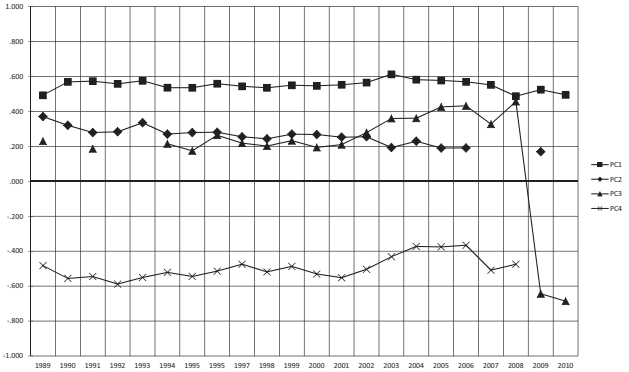


Figure 8. Standardized Partial Regression Coefficients for Prefectural Expenditures on Welfare for Children

financial conditions of prefectural governments were determinants of both the prefectural and total expenditure on elderly welfare in the 1990s, they were not significant in many FYs of the 2000s. The prefectural governments of urban areas with healthy finances could more easily afford elderly welfare than other prefectural governments in the 1990s. Even those prefectural governments located in areas that enjoyed stable social networks and residents who provided sufficient mutual assistance were expected to

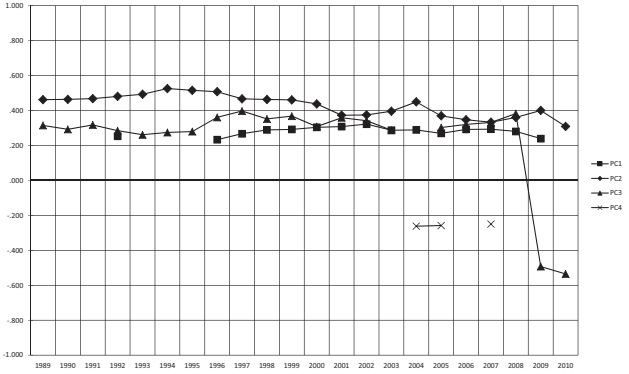


Figure 9.　Standardized Partial Regression Coefficients for Municipal Expenditures on Welfare for Children

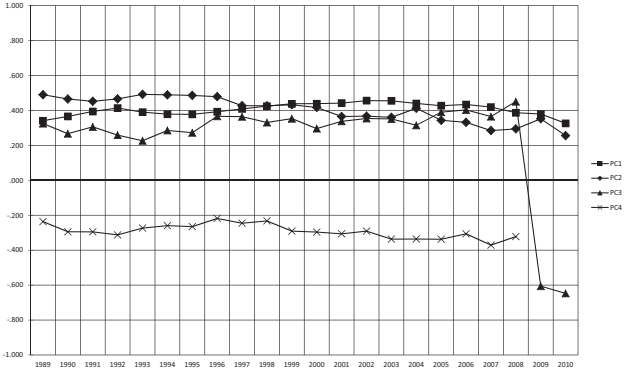


Figure 10.　Standardized Partial Regression Coefficients for Prefectural and Municipal Expenditures on Welfare for Children

spend more money on elderly welfare in the 2000s, compared to the 1990s.

The significant, standardized partial regression coefficients for PC4 in Figures 5 and 7 have negative signs.　One possible interpretation of these results is that, if a municipal government in a certain prefecture has fragile finances, their prefectural government will spend public money on welfare programs in place of the municipal government.

It is notable that the standardized partial regression coefficients for child

welfare spending do not gradually change over the time series, unlike the standardized partial regression coefficients for welfare expenditures for the elderly. The regression coefficients of PC3 for FYs 2009 and 2010 have different signs than those for other FYs. Prefectural finances do not give rise to this phenomenon. As displayed in Figure 3, the signs for the component loadings of "Prefectural Taxes," "Prefectural General Revenue," and "Prefectural Bonds" for FYs 2009 and 2010 are the same as the signs of those variables in other FYs. The signs of the component loadings for "Migration" and "Owned Homes" for the two FYs differ from those for other FYs. The signs of the component loadings for "Migration" and "Owned Homes" for FYs 1989–2008 are negative and positive, respectively. Those of "Migration" and "Owned Homes" for the remaining two FYs are positive and negative, respectively. Although the component loadings for "Percentage of Children" for FYs 2009 and 2010 are positive in Figure 3, the one for FY 2008 is also positive. Therefore, the high absolute values of the regression coefficients for PC3 in Figures 8–10 signify the existence of solid social networks. The constant standardized partial regression coefficients for PC1, PC2, and PC3 denote that prefectural and municipal governments —whether they are located in urban areas, in rural areas, or in areas with sufficient social networks— have consistently spent public money on welfare programs for children since 1989.

V. Discussion

There are several distinctions in the results for the PCA for the welfare expenditures for the elderly and the PCA for the welfare expenses for children. One of the distinctions is the transition of the significant standardized partial regression coefficients for PC1 over the time series. The signs of these regression coefficients are positive in the results of the analyses for the welfare for both seniors and children. The multiple regression analyses, however, revealed that while standardized partial regression coefficients for PC1 for welfare expenditures for the elderly gradually increase, those for welfare spending for children do not discernibly shift.

Another difference between the results of the regression analysis for welfare expenditures for the elderly and those of the regression analysis for wel-

fare spending for children is in the changes in standardized partial regression coefficients for PA2 across the time series. Although the significant regression coefficients for welfare expenses for children are positive and do not noticeably vary, those for the elderly decrease by degrees.

PC1 and PC2 can be interpreted as indicators of ruralization and urbanization, respectively. PC1 and PC2 can be also regarded as indicators of the solidness and fragility, respectively, of social networks. The transitions of the regression coefficients for PC1 and PC2 for elderly welfare expenses signify that prefectural and municipal governments were gradually required to expend public money on elderly welfare, even in areas that were suitable for constructing social networks, from the beginning of the 1990s to the end of the 2000s. The constant standardized partial regression coefficients for PC1 and PC2 for welfare expenditures for children indicate that rural and urban areas consistently demanded child welfare expenses from their prefectural and municipal governments from the 1990s through the 2000s. As explained above, PC3 is an indicator of solid social networks for the regression analysis for welfare expenses for children. The standardized partial regression coefficients for PC3 for welfare spending for children are almost constant during the 22 FYs, similar to those of PC1 and PC2 for welfare expenses for children. They are positive from FY 1989 to FY 2008, and negative in FYs 2009 and 2010. This result implies that prefectural and municipal governments need to substantially contribute to child welfare, even in areas that enjoy developed social networks.

The interpretation shown above provides us with a view of the influence of social networks on prefectural and municipal governments' welfare expenditures since FY 1989. This view indicates that social networks cannot be a substitute for prefectural and municipal governments in supplying residents with welfare services. Areas that possess developed social networks have demanded a gradual increase in public expenses for elderly welfare since the beginning of the 1990s. Prefectural and municipal expenditures for child welfare are constantly needed in rural areas, urban areas, and areas with enriched social networks.

It may be incorrect, however, to assert that social networks do not contribute to the welfare of the elderly and children. The actions taken by resi-

dents to aid elderly individuals and parents who are raising children in their communities have gradually become more enthusiastic and widespread since the 1990s. Solid social networks can encourage residents to act in these ways. It is possible that the development of social networks induces acts that support community welfare, arouse prefectural and municipal governments' attention to welfare programs, and bring about more public expenditures for welfare programs.

VI. Conclusion

This paper aimed to reveal the relation between social networks and prefectural and municipal government expenditures on welfare programs for seniors and children. The results of the analyses indicate that the standardized partial regression coefficients for the ruralization variable for welfare expenses for the elderly are positive and have risen from the beginning of the 1990s to the end of the 2000s, and that the standardized partial regression coefficients for the ruralization variables for welfare expenditures for children are positive and remain constant during this period. These findings do not imply that social networks replace prefectural and municipal governments as the supplier of welfare services. Social networks, however, may stimulate the attention that prefectural and municipal governments give to welfare for the elderly and children, and give rise to greater expenditures on welfare.

Acknowledgement

This work was supported by JSPS KAKENHI Grant Number 24530162. The grant also assisted in conducting research for the following research notes. This present paper is comprised of the information in those research notes.

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