Municipal and Prefectural Governments' Expenditures on Welfare of the Elderly in Japan: A Financial or a Social Issue?

Masayuki Hiromoto

Abstract

This article aims to reveal how municipal and prefectural governments in Japan have performed in the field of welfare for the elderly.　The method of analysis used is multiple regression analysis.　The dependent variables are the municipal and prefectural governments' expenditures on welfare for the aged.　The independent variables are factors concerning the elderly population, public finance, and social networks. The results of the analysis show that the municipal governments whose residents do not tend to form social networks spend more money on welfare for the aged. Moreover, the prefectural governments whose financial situations are in good standing are inclined to develop welfare programs for the aged.

I.　Introduction

One of the most serious problems in Japan is the continual increase of the elderly population.　The ratio of the aged people to the total population in Japan keeps on getting higher.　The 2005 percentage of the elderly people in Japan is larger in any other Organisation for Economic Co-operation and Development (OECD) countries (OECD.Stat Extracts).

In 1970, Japan became classified as an aging society, in which the proportion of the elderly to the total population is more than seven percent. Around 1970, problems concerning the aged started to become conspicuous. This required systematic welfare programs by the national government, prefectural governments, and municipal governments.

Municipal governments should be more responsible for welfare programs than the central government and prefectural governments because municipal governments serve people living in smaller areas.　Municipal governments can easily notice the problems of residents and thereby, quickly implement programs that can solve the difficulties of the people.　Prefectural governments, which include multiple municipalities, assist these

municipal governments in financing and coordinating programs. The area of a prefecture is smaller than that of the central government. Therefore, prefectural governments can easily be aware of issues within their areas and help the municipal governments more effectively than the central government. It depends on municipal and prefectural governments whether or not welfare policies are implemented successfully.

The Local Autonomy Law (*Chihō jichi hō*) was enforced in 1947. This law prescribes that municipal governments and prefectural governments undertake different roles. Prefectural governments are responsible for public administration in areas that includes plural municipalities and for coordination among municipal governments. In contrast, municipal governments implement public administration not covered by prefectural governments. The Local Autonomy Law gives more responsibilities to municipal governments than to prefectural governments. However, prefectural governments have contributed to the development of welfare programs for the elderly. Prefectural governments provide their residents novel welfare programs, which municipal governments cannot devise or finance.

How have municipal governments and prefectural governments played their roles in the field of elderly welfare? Have municipal governments quickly provided welfare programs for the aged after municipal governments find problems facing the elderly. Have prefectural governments limited their roles in supporting and coordinating programs of municipal governments?

This study aims to show how the two levels of the government have functioned to provide welfare programs for the aged. In order to reveal this, multiple regression analysis has been conducted. The analysis discloses what has influenced the municipal governments and prefectural governments' expenditures on welfare for the elderly. Furthermore, this study focuses on how the degree of social networks, which community members have formed, has affected the expenditures for elderly welfare. A common impression is that public programs for elderly people have not been developed because communities and families have traditionally supported the elderly in Japan. Even if public programs do not offer enough support for the aged, neighbors and family members care for their elderly. This study

show how much influence communities and families have had on public outlays for the aged.

II.   Literature Review

Several studies have been conducted on the differences in expenditures on elderly welfare among municipalities or prefectures in Japan.   Table 1 shows three studies, which are reviewed in this section.

The studies of Masegi (1992) and Saitō and Nakai (1991) revealed that the municipal governments' financial conditions influenced expenditures on elderly welfare.   The findings of the two studies differ.   Masegi showed that a healthy financial situation of a municipal government caused a large outlay on welfare for the aged.   In contrast, Saitō and Nakai explained that a city government whose financial capability index (*zaiseiryoku shisū*) was low still spent a large amount of money on elderly welfare. This means that a city government whose finance was not sound expended a large sum of money on welfare for the aged.

The different units of the studies can show the discrepancy of the findings. Whereas Masegi used data of the municipal governments in Nara Prefecture, Saitō and Nakai's data came from the city governments in all of the prefectures.   Nara Prefecture is one of the forty-seven prefectures in Japan. The municipalities in Japan can be divided into three groups: cities, towns, and villages.   In principle, cities have more population than towns or villages.   Because Masegi, and Saitō and Nakai differed in the units as well as scope of their studies, the results of their analyses also turned out differently.

Takemura et al. (1998) distributed questionnaires, which municipal governments returned to them.   Takemura et al. sent the questionnaires to all of the municipal governments in Japan.   This method made it possible to assess the situation across the nation.   The research disclosed that the size of the population, the annual expenditures of municipal governments, and the number of beds in special nursing homes for the aged (*tokubetsu yōgo rōjin hōmu*) influenced outlays on elderly welfare.

Apart from the mentioned variables, there are considerable factors that can affect the welfare expenditures of municipal governments and prefectural governments.   Hiromoto (2009) revealed that not only municipal and

Table 1. Previous studies

Study	Government	Object of study	Year of data for expenditure	Determinant	Relation with expenditure
Masegi (1992)	Municipal governments in Nara Prefecture	Expenditure on home care for elderly persons who need care per elderly person	FY 1988	The amount of a municipal government's annual revenue per capita	Positive
				The amount of a municipal government's general fund sources (*ippan zaigen*) per capita	Positive
Saitō and Nakai (1991)	City governments in Japan	Expenditure on elderly welfare per elderly person	FY 1989	The financial capability index (*zaiseiryoku shisū*) of a city government	Negative
				The percentage of the elderly people	Negative
				Mean income of residents	Positive
		Expenditure on home care for elderly persons per elderly person or per elderly person who need care		The population	Negative
Takemura et al. (1998)	Municipal governments in Japan	Expenditure on home care for elderly persons, on home-help (*hōmu herupu*) service, temporary-care (*shōto sutei*) service, and day-care (*dei kea*) service per elderly person or per elderly person who need care	FY 1996	The amount of a municipal government's annual expenditure per capita	Positive
				The number of special nursing homes for the aged (*tokubetsu yōgo rōjin hōmu*) per elderly person	Positive

prefectural finance but also the severity of the problem of the aging society as well as the presence of social networks could influence the number of home helpers for the elderly.

The high percentage of the aging population has been a serious problem. The degree of the seriousness of the aging population problem that has affected municipal governments and prefectural governments should be dealt with.

At the beginning of the 1980s, the central government of Japan decided to curtail welfare expenditure. The government demanded families and communities to support people who needed welfare programs. Municipal governments and prefectural governments' outlays on elderly welfare can change according to the circumstances of communities and families. Social networks are relations that community members and family members form. The presence of social networks can affect welfare expenditures of municipal governments and prefectural governments.

The examination of welfare programs and welfare expenditures in Japan requires not only the analysis of the severity of the aging society. It also necessitates the analysis of social networks in communities.

Hiromoto also explained the determinants of how the number of home helpers for the elderly has changed in over a period of twenty-eight years. His analysis covered Fiscal Years (FY) 1978–2005. The main determinants of the number of home helpers underwent changes during the twenty-eight years. This means that the welfare of the aged in Japan should be examined by using long-term data.

On the basis of the above review, the present study examines the whole area of Japan in order to understand the overall status of the nation.

The present study assumes that municipal and prefectural finance, the severity of the aging problem, and social networks can influence the municipal and prefectural governments' expenditures on elderly welfare. Studies of social networks have revealed that some conditions facilitate the construction of social networks or the strengthening of relations among members of social networks. The conditions for easy formation of social networks or strong relations among members of social networks are the following: (1) a family has many members; (2) many households own houses in a certain

area; (3) a community has many self-employed persons or many persons who are unemployed; and (4) a person has lived for a long period in a certain place (Harada et al. 2003, Nakao 2001, Namba 2002, Tateyama et al. 2000). The present study utilizes these findings concerning social networks.

III. Methodology and Data

The method and the data that the present study has employed are explained below.

Multiple regression analysis has been conducted. The unit of analysis is the prefecture. The period of analysis is FYs 1964–2007. Multiple regression analysis is conducted by using data for each fiscal year.

The Old-Age Welfare Law (*Rōjin fukushi hō*) became effective in August 1963. The Ministry of Home Affairs (*Jichi-shō*) included the statistical data for the outlays on elderly welfare (*rōjin fukushi hi*) of municipal governments and prefectural governments for the first time in the FY 1964 version of *Chihō zaisei tōkei nempō*, the yearbook of municipal and prefectural finance. The present study employs *Chihō zaisei tōkei nempō* in order to obtain data on the finance of municipal and prefectural governments. Therefore, the present study uses the data for FY 1964 as the earliest data.

The population size of the data is forty-six for each fiscal year of 1964 through 1973. Okinawa was restored to Japan as a prefecture in May 1972. Some data sets for FYs 1972 and 1973 lack data on Okinawa Prefecture. Hence, the present study does not include data for Okinawa Prefecture for the analysis of FYs 1972 and 1973. The N of the data is forty-seven for FYs 1974–2007.

The analysis uses two dependent variables: the municipal governments' expenditure on elderly welfare and the prefectural governments' expenditure on elderly welfare. The independent variables are the principal component scores, which are obtained through principal component analysis. Principal component analysis converts several variables into fewer variables. Multiple regression analysis with many independent variables can cause multicollinearity. This problem is avoided by using principal component analysis.

Table 2.　Variables and hypotheses

Group	Variable	Explanation	Hypothesis	Sources of data	Substituion of data
Dependent	Municipal expenditure on elderly welfare	The amount of a municipal government's expenditure on elderly welfare (*rōjin fukushi hi*) (classification by purpose) divided by the number of elderly people		Expenditure: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō*. Elderly population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku*. Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō*. Sōmu-shō. edit. Various years. *Jinkō suikei nempō*.	FYs 1964, 1966, 1967, 1968, and 1969 have no data. Data for FY 1965 → FYs 1964, 1966, and 1967. Data for FY 1970 → FYs 1968 and 1969.
	Prefectural expenditure on elderly welfare	The amount of a prefectural government's expenditure on elderly welfare (*rōjin fukushi hi*) (classification by purpose) divided by the elderly population		Expenditure: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō*. Elderly population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku*. Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō*. Sōmu-shō. edit. Various years. *Jinkō suikei nempō*.	FYs 1964, 1966, 1967, 1968, and 1969 have no data. Data for FY 1965 → FYs 1964, 1966, and 1967. Data for FY 1970 → FYs 1968 and 1969.

Aging	Percentage of the elderly	The elderly population divided by the total population	A municipal or prefectural government whose area has a high percentage of the elderly spends much money on elderly welfare.	Elderly population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. Various years. *Jinkō suikei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. Various years. *Jinkō suikei nempō.*	FYs 1964, 1966, 1967, 1968, and 1969 have no data. Data for FY 1965 → FYs 1964, 1966, and 1967. Data for FY 1970 → FYs 1968 and 1969.
	The elderly in a municipality	The elderly population in a prefecture divided by the number of municipalities within the prefecture	A municipal government whose area has a limited number of elderly people inefficiently spends much money on elderly welfare. A prefectural government whose area includes the area of the municipal government spends much money on elderly welfare in order to support the municipal government.	Elderly population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. Various years. *Jinkō suikei nempō.* Number of municipalities: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Jichi-shō. edit. 1971. *Zenkoku shichōson yōran.*	FYs 1964, 1966, 1967, 1968, and 1969 have no data. Data for FY 1965 → FYs 1964, 1966, and 1967. Data for FY 1970 → FYs 1968 and 1969.

Aging	The elderly in a prefecture	The elderly population in a prefecture	A prefectural government whose area has a limited number of elderly people inefficiently spends much money on elderly welfare. A municipal government whose area is included in the area of the prefectural government spends much money on elderly welfare, because the prefectural government does not sufficiently spends money on elderly welfare.	Elderly population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. Various years. *Jinkō suikei nempō.*
Finance	Municipal tax	The amount of a municipal government's tax per capita	A municipal government which has a large amount of tax spends much money on elderly welfare. A prefectural government whose area includes the area of the municipal government does not spend much money on elderly welfare, because the municipal government spends a sufficient amount of money on elderly welfare.	Tax: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2001–2004. *Kokusei chōsa ni yoru hokan hosei jinkō.* Sōmu-shō. edit. 2006 and 2007. *Jinkō suikei nempō.*

Finance	Municipal general fund resources	The amount of a municipal government's general fund resources (*ippan zaigen*), which a municipal government can spend without restain of the central government, per capita	A municipal government which has a large amount of general fund sources spends much money on elderly welfare. A prefectural government whose area includes the area of the municipal government does not spend much money on elderly welfare, because the municipal government spends a sufficient amount of money on elderly welfare.	General fund resources (local tax, local allocation tax, and local transfer tax): Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2001–2004. *Kokusei chōsa ni yoru hokan hosei jinkō.* Sōmu-shō. edit. 2006 and 2007. *Jinkō suikei nempō.*
	Municipal bond	The amount of a municipal government's bond per capita	A municipal government which has a small amount of bond spends much money on elderly welfare. A prefectural government whose area includes the area of the municipal government does not spend much money, because the municipal government spends a sufficient amount of money on elderly welfare.	Bond: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2001–2004. *Kokusei chōsa ni yoru hokan hosei jinkō.* Sōmu-shō. edit. 2006 and 2007. *Jinkō suikei nempō.*

Finance	Municipal debt expenditure	The amount of a municipal government's debt expenditure (classification by purpose) per capita	A municipal government which has a small amount of bond expenditure spends much money on elderly welfare. A prefectural government whose area includes the area of the municipal government does not spend much money on elderly welfare, because the municipal government spends a sufficient amount of money on elderly welfare.	Expenditure: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2001–2004. *Kokusei chōsa ni yoru hokan hosei jinkō.* Sōmu-shō. edit. 2006 and 2007. *Jinkō suikei nempō.*
	Prefectural tax	The amount of a prefectural government's tax per capita	A prefectural government which has a large amount of tax spends much money on elderly welfare. A municipal government whose area is included by the area of the prefectural government does not spend much money on elderly welfare, because the prefectural government spends a sufficient amount of money on elderly welfare.	Tax: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2001–2004. *Kokusei chōsa ni yoru hokan hosei jinkō.* Sōmu-shō. edit. 2006 and 2007. *Jinkō suikei nempō.*

		Variable	Description	Sources
Finance	Prefectural general fund resources	The amount of a prefectural government's general fund resources (*ippan zaigen*), which a prefectural government can spend without restrain of the central government, per capita	A prefectural government which has a large amount of general fund sources spends much money on elderly welfare. A municipal government whose area is included by the area of the prefectural government does not spend much money on elderly welfare, because the prefectural government spends a sufficient amount of money on elderly welfare.	General fund resources (local tax, local allocation tax, and local transfer tax): Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2001–2004. *Kokusei chōsa ni yoru hokan hosei jinkō.* Sōmu-shō. edit. 2006 and 2007. *Jinkō suikei nempō.*
	Prefectural bond	The amount of a prefectural government's bond per capita	A prefectural government which has a small amount of bond spends much money on elderly welfare. A municipal government whose area is included by the area of the prefectural government does not spend much money on elderly welfare, because the prefectural government spends a sufficient amount of money on elderly welfare.	Bond: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2001–2004. *Kokusei chōsa ni yoru hokan hosei jinkō.* Sōmu-shō. edit. 2006 and 2007. *Jinkō suikei nempō.*

				FYs 1964, 1966, 1967, 1968, 1969, 1971, 1972, 1973, 1974, 1976, 1977, 1978, 1979, 1981, 1982, 1983, 1984, 1987, 1988, 1991, 1993, 1994, 1996, 1997,
Finance	Prefectural debt expenditure	The amount of a prefectural government's debt expenditure (classification by purpose) per capita	A prefectural government which has a small amount of bond expenditure spends much money on elderly welfare. A municipal government whose area is included by the area of the prefectural government does not spend much money on elderly welfare, because the prefectural government spends a sufficient amount of money on elderly welfare.	Expenditure: Jichi-shō or Chihō zaisei chōsa kenkyū kai. edit. Various years. *Chihō zaisei tōkei nempō.* Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2001–2004. *Kokusei chōsa ni yoru hokan hosei jinkō.* Sōmu-shō. edit. 2006 and 2007. *Jinkō suikei nempō.*
Social network	Family	The population divided by the number of households	A municipal or prefectural government whose area has a limited average number of family members spends much money on elderly welfare in order to help elderly people who are not supported by social networks.	Population and number of households: Kokudo chiri kyōkai. 2008. *Jūmin kihon daichō jinkō yōran.*

| Social network | Owned house | The number of households which own houses divided by the number of households | A municipal or prefectural government whose area has a low percentage of households which own houses spends much money on elderly welfare in order to help elderly people who are not supported by social networks. | Number of households which own houses and number of households: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Kōsei-shō or Kōsei-rōdō-shō. edit. Various years. *Kokumin seikatsu kiso chōsa.* | 1999, 2002, 2003, and 2006 have no data. Data for FY 1965 → FYs 1964, 1966, and 1967. Data for FY 1970 → FYs 1968, 1969, 1971, and 1972. Data for FY 1975 → FYs 1973, 1974, 1976, and 1977. Data for FY 1980 → FYs 1978, 1979, 1981, and 1982. Data for FY 1985 → FYs 1983 and 1984. Data for FY 1986 → FY 1987. Data for FY 1989 → FY 1988. Data for FY 1992 → FYs 1991 and 1993. Data for FY 1995 → FYs 1994 and 1996. Data for FY 1998 → FY 1997. Data for FY 2000 → FY 1999. Data for FY 2001 → FY 2002. Data for FY 2004 → FY 2003. Data for FY 2007 → FY 2006. |
| | The self-employed | The number of self-employed persons [including | A municipal or prefectural government whose area has a low percentage of self-employed per- | Number of self-employed persons and number of family workers: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Shūgyō kōzō kihon chōsa hōkoku.* Kōsei-shō or Kōsei-rōdō-shō. edit. Various years. *Kokumin seikatsu kiso chōsa.* | FYs 1964, 1966, 1967, 1969, 1972, 1973, 1976, 1978, 1981, 1983, 1984, 1986, 1988, 1991, 1993, 1994, 1996, 1999, 2001, 2003, and 2006 have no data. Data for FY 1964 and 1966. Data for FY 1965 → FY 1967. Data for FY 1968 → FY 1967. Data for FY 1970 → FY 1969. Data for FY 1971 → FY 1972. Data for FY 1974 → FY 1973. Data for FY 1977 → FY 1976. Data for FY 1979 → FY 1978. |

	pieceworkers (*naishokusha*) and family workers divided by the population	sons and family workers spends much money on elderly welfare in order to help elderly people who are not supported by social networks.	Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2002 and 2007. *Jinkō suikei nempō.* Kōsei-shō or Kōsei-rōdō-shō. edit. Various years. *Kokumin seikatsu kiso chōsa.*	Data for FY 1980 → FY 1981. Data for FY 1982 → FY 1983. Data for FY 1985 → FYs 1984 and 1986. Data for FY 1987 → FY 1988. Data for FY 1990 → FY 1991. Data for FY 1992 → FY 1993. Data for FY 1995 → FYs 1994 and 1996. Data for FY 2000 → FYs 1999 and 2001. Data for FY 2004 → FY 2003. Data for FY 2005 → FY 2006.
Social network	No occupation: The number of people who are fifteen years old and over and who have no occupation divided by the population	A municipal or prefectural government whose area has a low percentage of people without occupation spends much money on elderly welfare in order to help elderly people who are not supported by social networks.	Number of self-employed persons and number of family workers: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Shūgyō kōzō kihon chōsa hōkoku.*	FYs 1964, 1966, 1967, 1969, 1972, 1973, 1976, 1978, 1981, 1983, 1984, 1986, 1988, 1989, 1991, 1993, 1994, 1996, 1998, 1999, 2001, 2003, 2004, and 2006 have no data. Data for FY 1965 → FYs 1964 and 1966. Data for FY 1968 → FY 1967. Data for FY 1970 → FY 1969. Data for FY 1971 → FY 1972. Data for FY 1974 → FY 1973. Data for FY 1977 → FY 1976. Data for FY 1979 → FY 1978. Data for FY 1980 → FY 1981. Data for FY 1982 → FY 1983. Data for FY 1985 → FYs 1984 and 1986. Data for FY 1987 → FY 1988. Data for FY 1990 → FYs 1989 and

Variable	Definition	Source	Notes
Social network	A municipal or prefectural government whose area has a high percentage of in-migrants and out-migrants spends much money on elderly welfare in order to help elderly people who are not supported by social networks.	Population: Sōri-fu, Sōmu-chō, or Sōmu-shō. edit. Various years. *Kokusei chōsa hōkoku.* Sōmu-shō. edit. 2003. *Waga kuni no suikei jinkō.* Sōmu-shō. edit. 2002 and 2007. *Jinkō suikei nempō.*	1991. Data for FY 1992 → FY 1993. Data for FY 1995 → FYs 1994 and 1996. Data for FY 1997 → FY 1998. Data for FY 2000 → FYs 1999 and 2001. Data for FY 2002 → FY2003. Data for FY 2005 → FYs 2004 and 2006.
Migration	The number of in-migrants who moved into municipalities and the number of out-migrants who moved out to other municipalities. The total number is divided by the population.	Number of in-migrants and out-migrants: Kokudo chiri kyōkai. 2008. *Jūmin kihon daichō jinkō yōran.* Sōri-fu. 1971–1980. *Jūmin kihon daichō jinkō idō hōkoku nempō.* Sōri-fu. Various years. *Jūmin kihon daichō ni motozuku jinkō idō hōkoku nempō.* Sōri-fu. Various years. *Jūmin tōroku jinkō idō hōkoku nempō.* Population: Kokudo chiri kyōkai. 2008. *Jūmin kihon daichō jinkō yōran.*	

Table 2 shows the dependent variables for the multiple regression analysis and the variables for the principal component analysis. The three groups of variables for the principal component analysis are aging, finance, and social network. The table includes the hypotheses relating to the variables for the principal component analysis.

IV. Results

Tables 3 and 4 as well as Figures 1–6 indicate the results of the principal component analysis and the multiple regression analysis.

As Table 3 shows, each fiscal year has three or four extracted components. Figures 1–4 show that the factor loadings of some variables are unstable during FYs 1964–2007. Marked changes of the factor loadings are seen in the second half of the 1960s and in the 1970s. The societies in Japan underwent conspicuous changes during that period. The 1960s were the period of rapid economic growth, whereas the beginning of the 1970s started the period of low economic growth. The factor loadings can reflect this transition.

Figure 1 has a clear change between FYs 1975 and 1976. Component 1 has high factor loadings of *Municipal Tax*, *Prefectural Tax*, and *Migration* but low factor loadings of *Percentage of the Elderly*, *Family*, *Owned House*, and *the Self-Employed* in FYs 1964–1975. However, the factor loadings of *Municipal Tax*, *Prefectural Tax*, and *Migration* are low, but the factor loadings of *Percentage of the Elderly*, *Family*, *Owned House*, and *the Self-Employed* are high in FYs 1976–2007. Component 1 has two parts. One is *Minor Problems of the Elderly, Good Municipal and Prefectural Finance, and Weak Social Networks* in FYs 1964–1975. The other is *Major Problems of the Elderly, Bad Municipal and Prefectural Finance, and Strong Social Networks* in and after FY 1976.

Figure 2 has a point of the conversion in the middle of the 1970s. Component 2 can be regarded as an element of *Weak Social Networks* by focusing on the factor indicators during and after the second half of the 1970s. The period has low factor loadings of *Family* and *Owned House* but high factor loadings of *Migration*. Component 2 can be labeled as *Weak Social Networks*.

Table 3.　Results of principal component analysis

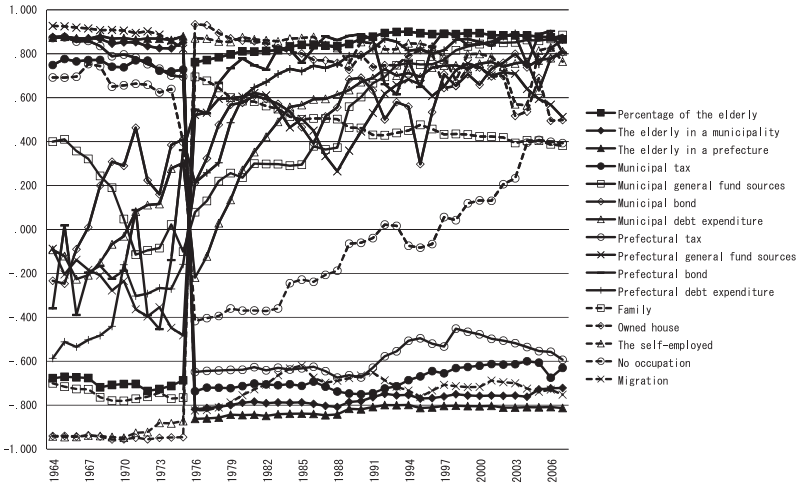| Fiscal year	Extracted components	Cumulative percentage of variance of eigenvalues	Fiscal year	Extracted components	Cumulative percentage of variance of eigenvalues
1964	4	84.032	1986	4	86.912
1965	4	83.669	1987	4	87.586
1966	4	84.412	1988	4	86.787
1967	3	76.875	1989	4	86.231
1968	3	77.489	1990	4	87.415
1969	4	84.335	1991	4	86.510
1970	4	83.834	1992	4	86.487
1971	4	84.112	1993	4	86.878
1972	4	84.341	1994	4	87.196
1973	4	84.093	1995	4	84.775
1974	4	84.062	1996	4	86.197
1975	4	84.119	1997	4	86.781
1976	4	85.734	1998	4	86.108
1977	4	86.139	1999	4	86.853
1978	4	86.429	2000	4	86.449
1979	4	86.790	2001	4	85.892
1980	4	87.178	2002	4	86.489
1981	4	86.385	2003	4	84.421
1982	4	86.005	2004	4	83.242
1983	4	86.637	2005	4	84.883
1984	4	87.117	2006	4	86.321
1985	4	86.684	2007	4	85.370

Figure 1.   Factor loadings in Component 1
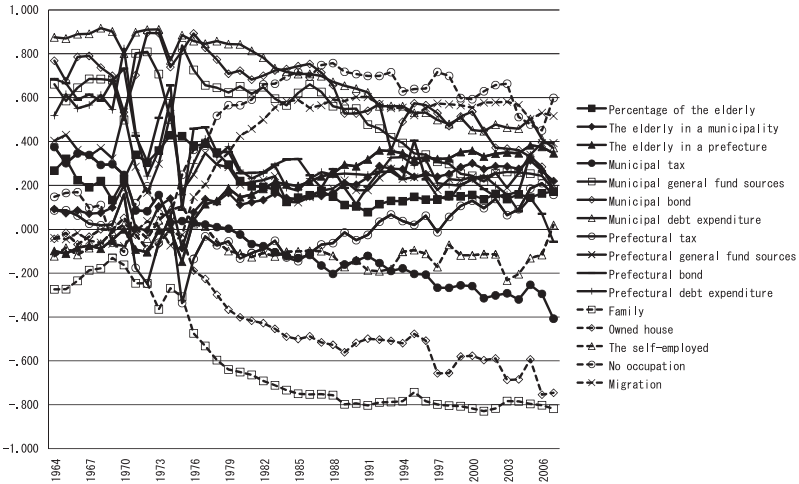
Figure 2.   Factor loadings in Component 2

Components 3 and 4 represent the financial conditions of the prefectural governments and the municipal governments, respectively.   As Figure 3 shows, the factor loadings of *Prefectural Tax* and *Prefectural General Fund Sources* are high in Component 3.   Figure 4 sets forth high factor loadings
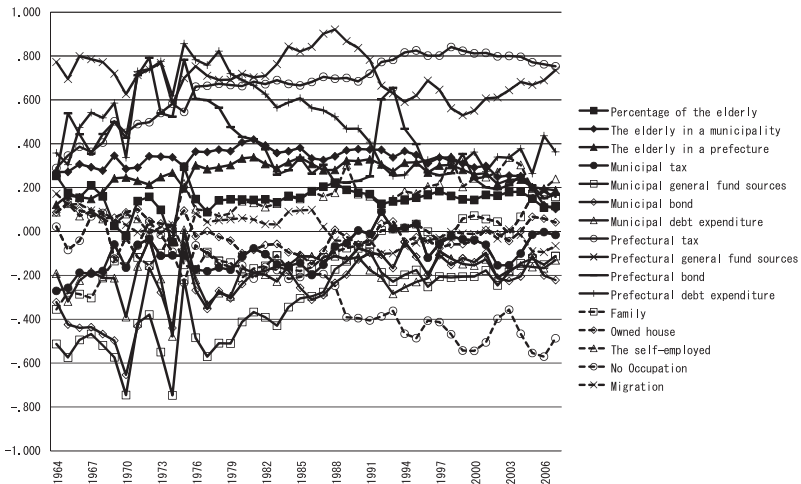
Percentage of the elderly
The elderly in a municipality
The elderly in a prefecture
Municipal tax
Municipal general fund sources
Municipal bond
Municipal debt expenditure
Prefectural tax
Prefectural general fund sources
Prefectural bond
Prefectural debt expenditure
Family
Owned house
The self-employed
No Occupation
Migration

Figure 3.　Factor loadings in Component 3

Percentage of the elderly
The elderly in a municipality
The elderly in a prefecture
Municipal tax
Municipal general fund sources
Municipal bond
Municipal debt expenditure
Prefectural tax
Prefectural general fund sources
Prefectural bond
Prefectural debt expenditure
Family
Owned house
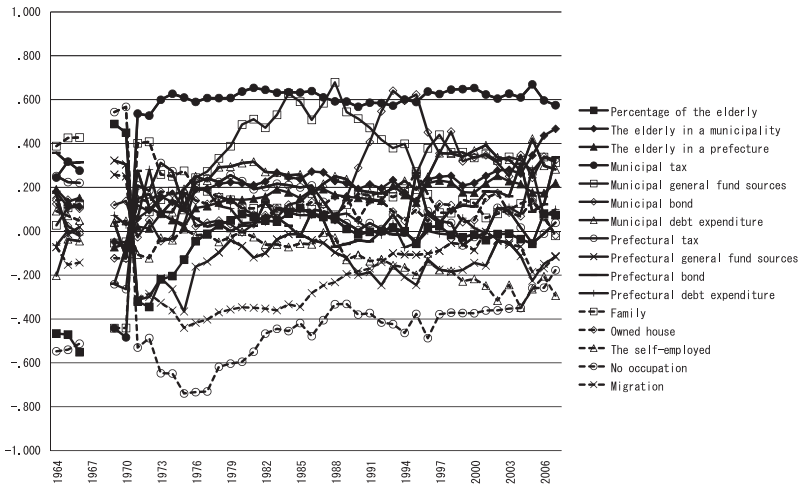The self-employed
No occupation
Migration

Figure 4.　Factor loadings in Component 4

of *Municipal Tax* in Component 4.　Components 3 and 4 are the indicators of the prefectural governments' finance and the municipal governments' finance, respectively.

　Table 4 and Figures 5 and 6 show the results of the multiple regression

Table 4.　Results of multiple regression analysis

Fiscal year	Municipal expenditure		Prefectural expenditure		Fiscal year	Municipal expenditure		Prefectural expenditure	
	Adjusted R square	ANOVA sig.	Adjusted R square	ANOVA sig.		Adjusted R square	ANOVA sig.	Adjusted R square	ANOVA sig.
1964	.575	.000	.604	.000	1986	.715	.000	.679	.000
1965	.518	.000	.282	.001	1987	.765	.000	.663	.000
1966	.327	.000	.244	.004	1988	.788	.000	.560	.000
1967	.274	.001	.323	.000	1989	.774	.000	.556	.000
1968	.135	.028	.328	.000	1990	.786	.000	.650	.000
1969	.290	.001	.584	.000	1991	.776	.000	.579	.000
1970	.158	.025	.637	.000	1992	.753	.000	.553	.000
1971	.160	.024	.710	.000	1993	.764	.000	.472	.000
1972	.350	.000	.485	.000	1994	.754	.000	.517	.000
1973	.343	.000	.652	.000	1995	.796	.000	.518	.000
1974	.409	.000	.687	.000	1996	.696	.000	.589	.000
1975	.419	.000	.667	.000	1997	.678	.000	.588	.000
1976	.492	.000	.675	.000	1998	.647	.000	.509	.000
1977	.491	.000	.652	.000	1999	.634	.000	.549	.000
1978	.477	.000	.692	.000	2000	.381	.000	.513	.000
1979	.440	.000	.685	.000	2001	.408	.000	.418	.000
1980	.451	.000	.661	.000	2002	.461	.000	.342	.000
1981	.470	.000	.636	.000	2003	.428	.000	.404	.000
1982	.525	.000	.651	.000	2004	.445	.000	.390	.000
1983	.571	.000	.634	.000	2005	.465	.000	.401	.000
1984	.606	.000	.637	.000	2006	.432	.000	.490	.000
1985	.658	.000	.717	.000	2007	.480	.000	.524	.000

analysis.　The dependent variables are the expenditures on elderly welfare
of the municipal and the prefectural governments.　The independent vari-
ables are the principal component scores, which are obtained through prin-
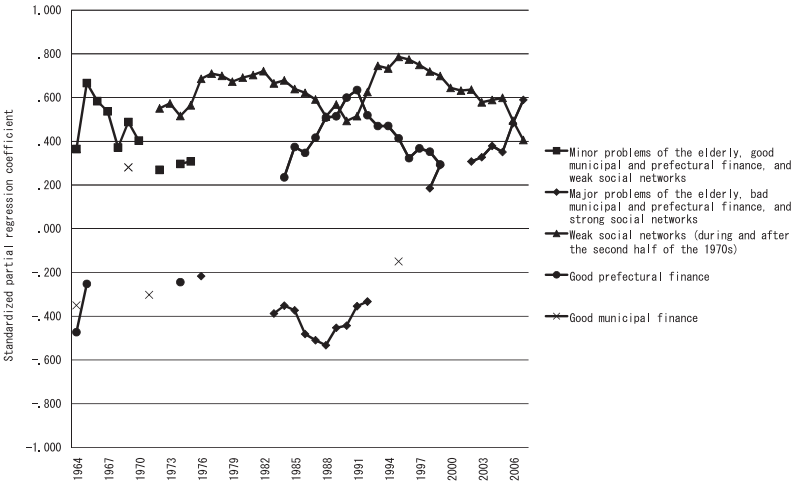
Figure 5.　Municipal expenditure on elderly welfare
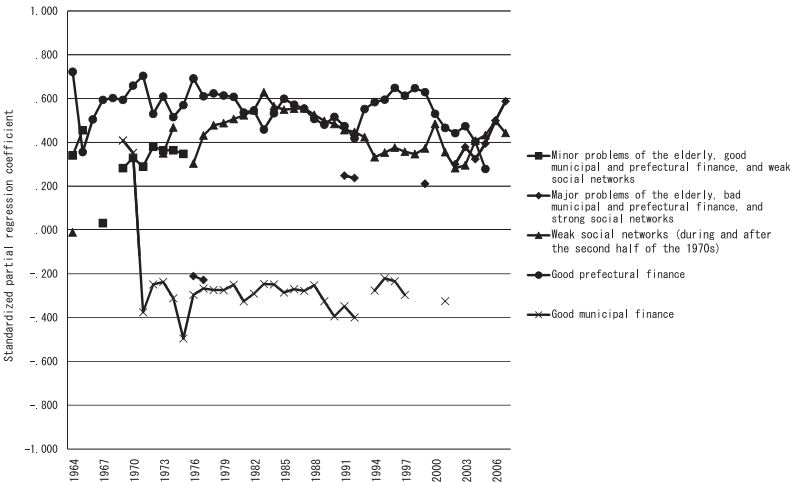

Figure 6.　Prefectural expenditure on elderly welfare

cipal component analysis.

　The dots on Figures 5 and 6 mean the dependent variables' standardized partial regression coefficients which are significant at the level of five percent.　As explained above, Component 1 has two parts.　The two parts

have opposite characteristics.   Therefore, the figures employs the different
shapes of dots for the dependent variable *Minor Problems of the Elderly, Good
Municipal and Prefectural Finance, and Weak Social Networks* and the
dependent variable *Major Problems of the Elderly, Bad Municipal and
Prefectural Finance, and Strong Social Networks*.

Figures 5 and 6 show that the dependent variable *Weak Social Networks*
has strong and positive relation with the expenditures for the elderly welfare
of the municipal and the prefectural governments during and after the 1970s.
The rapid economic growth in the 1960s caused urbanization and change in
the society.   The decline of social networks increased the importance of the
municipal and prefectural governments' welfare programs.   People whose
families or neighbors did not have sufficient support require public pro-
grams of welfare.   The strong relation between social networks and the
expenditures of municipal and prefectural governments was maintained until
FY 2007.

Figures 5 and 6 set forth a difference between the municipal and prefec-
tural expenditures.   As Figure 6 shows, the independent variable *Good Pre-
fectural Finance* has significant and positive regression coefficients.   This
means that prefectural governments whose finance is not sound are unwill-
ing to spend money on welfare for the aged.   However, there are no continu-
ously positive relation between municipal expenditures on elderly welfare
and the independent variable *Good Municipal Finance*.   Thus, noticeably,
existence of social networks rather than the financial standing of municipal
governments has more relevance to the municipal governments' welfare pro-
grams for the aged.

V.   Conclusion

The present study aimed at examining how Japan's municipal govern-
ments and prefectural governments have performed in the field of welfare
for the elderly.   The present study focused on whether social networks
have a correlation with the expenditures of municipal and prefectural
governments.

The multiple regression analysis revealed the common and different fea-
tures of the municipal and prefectural governments.   The two levels of the

government tend to spend more money on welfare for the aged if social networks are not solid in their areas.　However, prefectural governments tend to restrain their expenditure on elderly welfare if their financial standing is not good.

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