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Abstract

This paper, using individual data from Japan, explores how the circumstances of where a person resides is related to the degree of their investment in social capital. Controlling for unobserved area-specific fixed effects and various individual characteristics, I found: (1) Not only is the rate of homeowners in a locality positively related to investment in social capital, but the rate of homeownership there increases an individual's investment in social capital. (2) The effect of local neighborhood homeownership is distinctly larger than that of an individual's when endogeneity bias is controlled for using instruments such as land price and the rental price of an apartment.

Keywords: Social Capital, Rate of homeowner.

JEL classification: D71, R11, R23.

1. Introduction

Recently, there has been a growing number of regional studies focusing on the issue of social capital (e.g., Glaeser and Redlick 2008; Kilkenny 2006; Westlund 2007). Glaeser et al. (2002). These studies have applied an investment model for analysis of social capital formation. In this model, the accumulation of social capital depends on an individual's decision making concerning investment in social activities. Based on this individual decision making, from the view point of the spatial dimension, empirical studies have attempted to investigate how and the extent to which social capital is accumulated. These studies make it evident that homeowners are more likely to invest in social capital because of their lower mobility rates (DiPasquale and Glaeser 1999; Hilber 2007).

On the other hand, a household's social ties with neighbors, which can be considered a kind of social capital, lead to benefits for residents through the reduction of transaction costs and through non-market reciprocal behavior[1]. Residents get benefits from the community services provided by community member's collective action. Monitoring and sanctioning free riders is important to resolve the free rider problem when collective action is required. The larger the social capital is, the more effective and stronger monitoring and sanctioning are through ostracism or opprobrium, resulting in greater benefits. Social capital can be regarded as local public goods and so only community members get the benefits from this social capital (Hayami 2001)[2].

[1] Social capital was found to improve health status through non-market personal interaction (Kawachi et al. 1997, 1999).

[2] Because of the disappearance of this benefit when a household moves from the current address where larger social capital is accumulated, the incentive for moving is reduced leading to low residential mobility (Kan 2007).

Furthermore, sanctioning and monitoring mechanisms strengthened by lower population mobility lead people to invest in social capital[3].

Not only an individual's characteristics, but also those of their neighbors are expected to have an important effect on a resident's behavior concerning investment in social capital[4]. However, the level of homeownership among neighbors has not been investigated, with the exception of DiPasquale and Glaeser (1999)[5]. Furthermore, although investment in social capital appears to depend on socio-economic conditions, there are few investigations outside those conducted in Western countries. To compare the results from Western countries with the rest of world, it is necessary to analyze how social capital is accumulated in countries other than Western ones.

For instance, comparative studies have shown that the influence of surrounding people on individual behavior is greater in Japan than in United States (e.g., Benedict 1946, Ames 1981, Yamagishi 1988a, 1988b). In addition, the importance of social capital on the process of economic development in Japan is increasingly recognized (e.g., Yamamura, 2008a, 2008b, 2008c, 2009a). These reports suggest that individual investment in social capital is significantly affected by the character of neighbors in Japan, thereby affecting economic performance. From a comparative viewpoint of

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[3] Benabou and Tirole (2006) develop a theoretical model in which social reputation or pressure from other individuals such as neighbors' influences motivation for prosocial behavior.

[4] People are found to be less inclined to cooperate to resolve collective problems in more heterogeneous communities (Alesina & La Ferrara, 2000; Yamamura 2008b).

[5] DiPasquale and Glaeser (1999) explored the effects of individual homeownership and neighbor's homeownership on social capital formation. This work, however, focused mainly on effect of individual homeownership rather than that of neighbor's homeownership.

regional development, Japan as a case study is thought interesting. This paper uses individual level data from Japan to investigate the effects of individual homeownership and that of neighbors; I then compare the former with the latter.

The organization of the remainder of this paper is as follows: In section 2, the characteristics of Japanese society are outlined to provide a back ground for the study and highlight the features of social capital in Japanese society. Section3 describes data, methods of analysis and estimation strategies. The results of the estimations and their interpretation are provided in section 4. The final section offers concluding remarks.

2. Features of Japanese society

Japan appears characterized by a racially and economically homogeneous society with long-term interpersonal relationships, resulting in an abundance of accumulated social capital (Fukuyama 1995). In line with this view, the classical work of Kawashima (1963) focuses on Japan's cultural preference for informal mechanisms of dispute resolution and asserts that the harmonious nature of Japan discourages people from litigation. Contrary to this view, a number of works have argued that the reluctance for litigation in Japan can be explained by individualistic reasons rather than a harmonious nature when people are confronted with conflict (e.g., Ginsburg and Hoetker 2006, Haley 1978, Ramseyer 1988, Ramseyer and Nakazato 1989, 1999). Monitoring and sanctioning each other's behavior plays a greater role in improper actions such as free-riding in a tightly knitted community (Hayami 2001). Monitoring and sanctioning improper behavior is considered to be stronger in Japan than in the United States (Ames 1981). Such mechanisms can theoretically be explained by game theory, which is in line with individualistic behavior (Grief 1993, Kandori 1992). These

facts lead us to conjecture that the “harmonious nature” assigned to the Japanese is heavily based on the monitoring and sanctioning system and is not inconsistent with rational individuals.

The classical work of Benedict(1946) points out that the cultural collectivism in Japanese society is “externally” sustained by a system of mutual monitoring and sanctioning rather than “internally” sustained by an internalized value system. According to Yamagishi (1988a, 1988b), Japanese society provides a system of mutual monitoring to reduce the incentives for free riding. However, Americans have a higher level of generalized trust than Japanese in situations where mutual monitoring and sanction do not exist (Yamagishi and Yamagishi 1994, Yamagishi et al 1998). This is contrary to the seemingly general view of trust among Japanese (Fukuyama 1995). What comes out of these works is that Japanese people are more likely to be affected by long-term interpersonal relationships even if they are more individualistic than Western people. Social norms stemming from monitoring and sanctioning within the Japanese community are considered a crucial factor enhancing collective actions such as responding to a census (Yamamura 2008 b) and voting behavior (Yamamura 2008 e).

The characteristics of neighbors influence the degree to which a community functions well. Neighbors are thus expected to play a major role in an individual’s decision making concerning investment in social capital. Hence, Japanese society is considered as an ideal case to analyze how and the extent to which the presence of neighbors has an influence on investment in social capital when an individual’s characteristics are controlled for. Furthermore, it is interesting to compare the effects of individual homeownership and neighbor homeownership on the formation of social capital in Japan.

3. Data and Methods

3.1. Data

This paper uses JGSS data, which are individual level data[6]. The JGSS surveys adopted a two-stage stratified sampling method and were conducted throughout Japan in 2003. JGSS was designed as the Japanese counterpart to the General Social Survey in the United States. This survey asks standard questions concerning an individual's and his/her family characteristics through face-to-face interviews. This data covers information related to one's marital and demographic (age and gender) status, annual income[7], years of schooling, age, number of children, kind of residence, characteristics of respondent's residential area[8], size of residential area, and prefecture of residence. According to the population size of a geographical area, sampling points were divided into three groups; (1) large cities, (2) other cities, and (3) villages and towns. Data were collected on 3663 adults, between 20 and 89 years-old. The variables used for regression

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[6]Data for this secondary analysis, "Japanese General Social Surveys (JGSS), Ichiro Tanioka," was provided by the Social Science Japan Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, The University of Tokyo.

[7] There are 19 income categories. (1) None, (2) Less than 700,000 yen, (3) 700,000– 1 million yen, (4) 1– 1.3 million yen, (5) 1.3 – 1.5 million yen, (6) 1.5– 2.5 million yen, (7) 2.5– 3.5 million yen , (8) 3.5 – 4.5 million yen, (9) 4.5– 5.5 million yen, (10) 5.– 6.5 million yen, (11) 6.5– 7.5 million yen, (12) 7.5– 8.5 million yen, (13) 8.– 10 million yen, (14) 10– 12 million yen, (15) 12 – 14 million yen,(16) 14– 16 million yen, (17) 16– 18.5 million yen, (18) 18.5 – 23 million yen, (19) 23 million yen or over.

[8] There are 5 area categories; (1) Area where a number of factories are located, (2) Area where a number of stores and offices are located, (3) Old residential area (residential area from the pre-war period), (4) New residential area (including new towns developed after the war), (5) Farming/fishing village.

estimations are shown in Table 1, which provides definitions and basic statistics. I see from this that over half of the sample was collected from the medium-sized cities. One fourth of the sample is from villages and towns. Respondents did not respond completely to all questions, and therefore, the number of samples used for the regression estimations range between 1693 and 1545.

DiPasquale and Glaeser (1999) defines the local group as each city-size category in each state, and calculate the local homeownership by calculating average homeownership rate in each group. Following DiPasquale and Glaeser (1999), I define the local group as follows[9]: As explained above, sample points consist of 47 prefectures. Sample points were also divided into 3 groups categorized by population size. Hence, prefecture-population groups can be divided into 141, which are defined as local areas in this paper. Nevertheless, actually large cities exist only in 12 prefectures. One prefecture (Tokyo) does not contain town and village. Hence, there are 105 prefecture-population groups. Based on these groups, the rate of homeowners is calculated. Table A1 in APPENDIX presents the rates of homeowners in each group.

Putnam (2000) indicates that social capital is defined as the features of a social organization such as networks and norms, and that social trust facilitates coordination and cooperation. Hence, social capital can be interpreted in various ways; thereby causing ambiguity and criticism about it measurement and the definition (e.g., Paldam 2000; Durlauf 2002a, 2002b). It is necessary to use various indexes of social capital when analyzing the formation of social capital. DiPasquale and Glaeser (1999) examined the impact of homeownership using various variables to

[9] It should be noted that a local group as defined in this paper does not reflect a geographical scale. Considering a geographical scale is beyond the scope of this paper. This is an issue remaining for future work.

capture investment in social capital[10]. Comprehensive analyses such as that of DiPasquale and Glaeser (1999) are thus ideal. Conversely, the interpretation of results provided by such comprehensive analysis can be undertaken in various ways, making it difficult to clearly understand the implications of the results. Accordingly, for an in-depth study, it is important to focus on one aspect of social capital.

Apprehension of bad behavior such as criminal acts depends on the watchfulness of citizens (Huck and Kosefeld, 2007). Neighborhood watches are likely to be more effective if the members are involved in community activity, resulting in a decrease in criminal acts and thereby raising benefits for residents. In the case of Japan, it has been reported that community involvement increases the benefit for community members by decreasing victims of natural disasters (Yamamura 2008d) and crimes (Yamamura 2009b). These suggest that involvement in ones community has a critical role in Japanese society. Hence, this paper concentrates on community involvement to examine investment in social capital. Thus, social capital was measured based on the question "Are you actively involved in the activity of a neighborhood association?" Responses were scored as 1 (Yes) or 0 (No). The questionnaire included the following question concerning a respondent's residence, "In which of following do you live?" In this paper, a homeowner is defined by the respondent choosing "Own house" from the possible responses[11].

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[10] Indexes of investment in social capital used in DiPasquale and Glaeser (1999) are as follows; (1) membership of non-professional organizations, (2) knowing the names of local political leaders, (3) participation in solving local problem, (4) voting in local elections, degree of leisure activities, (5) gun ownership, and (6) church attendance.

[11] The possible responses to the question were "(1) Own house", "(2) Own condominium (apartment)", "(3) Rented house owned by a private company", "(4) Rented apartment house owned by a private company," "(5) Company house or house for government

As referred to later, this paper employs a two-stage model. 1975　In this mode, the 1975 prices (per m^2) for land and the rental price (per $3.3m^2$) of an apartment for a month　are used as instrumental variables. These variables are at the average values at a prefectural level. There are several factors concerning land prices in a prefecture; therefore, mean values are used here as the land price. The data used to calculate land price is available through the web pages of the Ministry of Land, Infrastructure, Transportation and Tourism[12]. The rental price of an apartment was obtained from the Index Corporation. (2006).

3.2. Econometric Framework and Estimation Strategy

Figure 1 shows a positive association between the homeowner rate and the rate of participation in neighborhood associations, indicating that a homeowner is more likely than a non-owner to invest in social capital. This result is in line with an earlier report that barriers to mobility give individuals an incentive to investment in social capital (DiPasquale and Glaeser 1999; Hilber 2007).

I now explore how individual homeownership and the local circumstance of individuals, captured by neighbor homeownership, are related to individuals' investment in social capital. Following the model used by DiPasquale and Glaeser (1999), the estimated function takes the following form:

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employees", "(6) Company apartment house or apartment house for government employees", "(7) Rented public house of a public corporation", "(8) Rented public apartment of a public corporation", "(9) Other".

[12] http://www.land.mlit.go.jp/landPrice/AriaServlet?MOD=0&TYP=0 (accessed at November 27, 2009). There are various categories of land, such as land for business district, land for industrial district…etc. In this paper, the price of land for housing is used as the land price.

$$SC_{im} = \alpha_0 + \alpha_1 HOME_{im} + \alpha_2 AVHOME_m + \alpha_3 AVLIVE20_{im} + \alpha_4 MALE_{im} + \alpha_5 AGE_{im} +$$

$$\alpha_6 EDU_{im} + \alpha_7 MARRI_{im} + \alpha_8 CHILD_{im} + \alpha_9 MCITY_m + \alpha_{10} TOWN_{im} + u_{im},$$

where SC_{im} represents the dependent variable in resident i, and area m. α's represents regression parameters. SC_{im} takes 1 if one participates in the neighborhood association, otherwise takes 0. Hence, The Probit model is employed to conduct estimations. u_{im} represents the error term.

It is reasonably to assume that observations might be spatially correlated within a given economic region, as neighborhood involvement of one agent might well relate to the involvement of another agent in the same neighborhood. In this study, such regions correspond to the 105 functional economic areas defined previously. To consider such spatial correlation in line with this assumption, I use the Stata Cluster command and report robust z-statistics. The advantage of this approach is that the magnitude of spatial correlation can be unique to each area.

The individual homeownership dummy, HOME, is used to capture the homeowner effect. If a homeowner tends to invest in social capital, the anticipated sign of HOME is positive. As discussed by DiPasquale and Glaeser (1999), HOME is possibly correlated with the unmeasured factors included in u_{im}. HOME is thus thought to be an endogenous variable, resulting in estimation bias. Assuming that a high rate of homeownership makes a region more stable and tightly knitted, AVHOME can be also considered as an endogenous variable. This is because an individual who tends to participate in neighborhood associations is likely to live in a stable community with a high rate of homeownership[13]. Hence, in added to the Probit estimation, I also conduct a

[13] DiPasquale and Glaeser (1999) regard the average group homeownership rate as an exogenous variable and use it as an instrument variable. Though they fail to consider the possibility of the endogeneity of average group homeownership.

two-stage Probit estimation using the instrumental variables of HOME and AVHOME. In the first stage where HOME and AVHOME are dependent variables, HOME is a dummy variable and so Probit estimation should be employed; whereas AVHOME is not a dummy variable and so OLS estimation can be used. By conducting these estimations, the predicted values of HOME and AVHOME can be obtained and then used as independent variables in the second-stage Probit estimations.

The rate of neighborhood homeownership can be regarded as the degree of local population immobility, since homeownership creates a barrier to mobility. It seems plausible for homeowners that better relations with neighbors increases the long-term benefits through interpersonal interactions since homeowners are less likely to move. Accordingly, homeowners have a tendency to invest in social capital for the purpose of maintaining good relationships or creating better associations among neighbors (DiPasquale and Glaeser 1999). Therefore, the sign of HOME is anticipated to become positive.

Monitoring and sanctioning mechanisms are not effective an area where interpersonal relationships are fragile, which leads to the free-rider problem and so makes collective action difficult. As a result, residents are less likely to invest in social capital. Furthermore, a lack of collective action reduces the benefit from the investment in social capital. To put it differently, if there is only a small amount of social capital in an area, the benefit obtained from participation in neighborhood association activity is reduced. Hence, a scarcity of social capital in an area reduces the incentive to invest in social capital. The corollary of this is that abundant social capital enhances an individual's investment in social capital and increases the benefit. Neighborhood

homeownership is measured by group average HOME rate (AVHOME)[14]. I see from Table 2 that the average HOME rate is lower in the larger areas mainly because land prices are higher in more urbanized areas. Furthermore, Table 2 shows that SC is larger in the smaller areas, presumably because the higher homeowner rate leads residents to invest in SC, which is consistent with the argument above. These lead us to expect AVHOME to take positive signs.

In addition to HOME and AVHOME, several control variables are included to capture individual characteristics: male's dummy, age, years of schooling, number of children marital status. Furthermore, the size of the residential area is captured by MCITY (medium-size cities) and TOWN (town and village). The group living in large-size cities is the reference group.

3.3. Instrumental Variable

It is reasonable to argue that whether individual becomes a homeowner depends on land prices. On the other hand, land prices are not related to the determinants of participation in neighborhood associations. Accordingly, the land price can be used as an instrumental variable of homeownership. Furthermore, as the decision to purchase has been made at an earlier time, it is more appropriate to use a land price in the past, rather than the current price. As well, historic average land price data at the prefecture level are available. Thus I used the average prefecture land price for 1975, LAND75, as an instrumental variable. Figure2 (a) shows the negative relationship between the land price in 1975 and the rate of home ownership in 2003, which is consistent with basic

[14] To exclude an individual i' s effect from i' s local group average, i' s sample is omitted from the samples when local average values are calculated.

economic theory. In addition, the rental price of a private apartment is thought to reflect the land price and so its value in 1975, APART75, is employed as instrumental variables. On the other hand, an apartment is considered a substitute for a home. If this is true, higher prices for apartments lead to a higher rate of home ownership. The fact that the rental price of an apartment in 1975 reduces home ownership in 2003 is seen in Figure2 (b), suggesting that the rental price of an apartment reflects the land price.

4. Estimation Results and their Interpretation

Table 3 reports results using a Probit model. In (columns 1) to (3), annual income dummies are incorporated, whereas in (4) to (6) annual income dummies are not included, leading to an increase of the sample size. Columns (1)-(4) in Table 4 and (1)-(3) in Table 5 present results including the annual income dummy. Columns (5)-(8) in Table 4 and (4)-(6) in Table 5 present results excluding the annual income dummy. The omission of income dummies is thought to cause omitted variable bias, but subdues the sample selection bias.

4.1. Probit model

Looking at the first row in Table 3 shows that HOME has positive signs in all estimations, and is statistically significant. This implies that a homeowner is more likely to invest in social capital, which is consistent with DiPasquale and Glaeser (1999). With respect to the neighbor effect, AVHOME produces the expected positive signs in all estimations and is statistically insignificant. It follows from this that a barrier to mobility caused by individual characteristics enhances social capital investment, which is congruent with the anticipation. On the other hand, contrary to expectation,

neighbor's characteristics do not influence social capital investment. However, these results are thought to suffer from endogenous bias and so I proceed to analyze results that control for this bias by instrumental variables.

4.2. Two-stage model

Table 4 presents results where the endogeneity of HOME or AVHOME is controlled for using an instrumental variable. In table 5, various sets of instrumental variables such as land price and the rental price of an apartment, and their squared values are used to estimate predicted values of HOME and AVHOME. In all results of the first stage estimations, the validity of two-stage estimations is shown in LR chi-square values in the Probit estimation for HOME and F-statistics in the OLS estimation for AVHOME.

With respect to Table 4, HOME yields the expected positive signs and is statistically significant at the 1 % level in all estimations. When the rental price of an apartment is used as an instrumental variable, the magnitudes of the coefficients of AVHOME are remarkably larger than those of HOME; showing that neighborhood homeownership has a greater role in the increase of investment in social capital than individual homeownership. On the other hand, AVHOME produces positive signs in all estimations, but these are not significant when land price is used as an instrumental variable. The unstable results of AVHOME are thought to suffer from an omitted variable bias because both HOME and AVHOME are not incorporated in the function at the same time. Concerning the first stage, the coefficients of land price and the rental price of an apartment show the anticipated negative signs.

I now turn to the results of Table 5 where both HOME and AVHOME are

simultaneously incorporated in the function as independent variables. In all estimations, HOME continues to exhibit significant positive signs at the 1 % level. On the other hand, it is interesting to observe that AVHOME yields, with the exception of column (5), significant positive signs. Four of six show that the degrees of the coefficients of AVHOME are larger than 1, whereas none of those of HOME are larger than 1. The degrees of the coefficients of AVHOME are, with the exception of column (5), distinctly larger than those of HOME. Thus it is evident that neighbor homeownership makes a greater contribution to increases in social capital formation than does individual homeownership.

The evidence from the United States provided by DiPasquale and Glaeser (1999) shows that the local homeownership rate does not significantly affect social capital investment, while their model predicts that local homeownership rates will affect investment in social capital[15]. Thus the evidence from the United States is contrary to that from Japan, consistent with this research. One reason why the neighbor effect is different between the United States and Japan might be that collective action in Japanese society is more likely to depend on sanctioning and monitoring than in the United States (Yamagishi 1988a, 1988b).

Significant negative signs for AGE, appeared in all estimations, seemingly reflecting

[15] As stated in the data section, JGSS, is designed as the Japanese counterpart of the General Social Survey undertaken in the United States, which is used in DiPasquale and Glaeser (1999). Hence, the variables used in this study, to a certain degree, correspond to those used in DiPasquale and Glaeser (1999). In the U.S. General Social Survey, respondents were asked the question whether they had ever actively participated in trying to resolve a local problem. DiPasquale and Glaeser (1999) used the response to this question as a proxy variable for social capital. This index is thought to correspond to the proxy of social capital in this paper.

that older people are less likely to acquire benefits from long-term relationships within a community because their “remaining life” is shorter. This suggests that the behavior of Japanese is individualistic and rational. According to EDU representing years of schooling, higher-educated people can work for higher wages, resulting in larger opportunity costs. This leads us to expect that a higher number of years of schooling reduces the incentive to invest in social capital because of the larger opportunity cost. Contrary to this expectation, EDU yields positive signs and is statistically significant at the 1 % level. Though this result might be open to discussion, I interpreted it as follows. Assuming that the benefit from social capital investment from a long term point of view is larger than the current opportunity cost, educated people are more able to anticipate this. MARRI representing married people yields significant positive signs in all estimations, implying that people with a spouse are more likely to get involved in neighborhood associations.

It is surprising to observe that the coefficients of MCITY and TOWN are negative and statistically significant at the 1 % level. This implies that compared with large cities (reference group), residents of medium-size cities, villages and towns are less inclined to invest in social capital, which is seemingly inconsistent with the argument presented thus far. What is more, the coefficient and z-statistics of TOWN are larger than those of MCITY. It follows from that observed in the results of MCITY and TOWN that people living in larger areas are more likely to invest in social capital, which is not in line with Table 2. I interpret these results as suggesting that those living in urbanized areas where people do not have an intimate acquaintance with neighbors are more likely to invest in social capital, if population immobility, which provides sanctioning and monitoring, is controlled for. That is, all else being equal, people living

in urban areas are more likely to make an acquaintance with a stranger and attempt to build new personal relationships with strangers. Conversely, people living in a tightly-knit community are more likely to maintain or improve relationships with acquaintances or colleagues in the neighborhood, but are less likely to interact with strangers. These suggest that the amount of accumulated social capital increases the incentive to improve or maintain existing well-established relationships within a community, but decreases the incentive to become acquainted with strangers and construct intimate relationship with them. Yamagishi and Yamagishi (1994) define a well-established relationship as mutually committed relationships where the partner's cooperation is assured. What is more, they present the distinction between trust and assurance as "*Trust requires social uncertainty, and assurance requires the lack of it*" (Yamagishi and Yamagishi 1994, p.160). Following this definition, "what is conventionally considered to characterize Japanese society is mutual assurance derived from the stability of interpersonal and/or interorganizational relations (Yamagishi and Yamagishi 1994, p.160)". In this paper, investment in social capital is captured by participation in neighbor associations. Such investment enhanced by individual and neighbor homeownership is associated with *assurance*, rather than *trust*. On the other hand, investment in social capital, which is larger in urban areas than others, can relate with *trust*. If this is the case, the urbanized section of Japanese society can be characterized by trust, rather than assurance. Concerning this, urban Japan has changed from what could be described as traditional Japanese society to have characteristics that are shared with western society.

5. Conclusions

Features of Japanese society concerning social capital appear to be different from those of Western societies, since Japanese people are more likely to be affected by long-term interpersonal relationships. Previous studies have well explored how and the extent to which the incentive to invest in social capital increases when individuals own their home. However, few works attempt to investigate the effects of a neighbor's homeownership on individual investment in social capital. In particular, the neighborhood effect stemming from population immobility is thought to have a greater effect in Japanese society than western ones, since monitoring and sanctioning mechanisms are more effective in Japan. This paper investigates how the circumstances of where a person resides are related to the degree of their investment in social capital using data of 1693 adult participants in the 2000 JGSS survey. Using instrumental variables to control for endogenous bias, I find the following;

(1) Not only that an individual's homeownership is positively related to his/her investment in social capital, but that the rates of homeownership in a locality increase an individual's investments in social capital.

(2) The effect of local neighbor homeownership on investment in social capital is distinctly larger than that of an individual's homeownership.

(3) Residents in larger cities are more likely to invest in social capital than those in smaller ones.

This study, by controlling for endogenous bias, showed that that the impact on social capital formation of a neighborhood's immobility is larger than that of an individual's when a person makes a decision regarding investment. What was highlighted in this exploration was that not only an individual's characteristics but also the positive externality stemming from neighborhood immobility make a contribution to the

formation of social capital and hence should be considered in studies related to social capital. The evidence provided thus far, however, does not support the argument that Japanese people are more likely to behave based on some posited harmonious nature. The fact that residents in rural areas are less likely to invest in social capital than those in urban areas, after controlling for homeownership effects, suggests that traditional Japanese society is rather individualistic and rational when sanctioning and monitoring are not effective.

This study did not control for unobservable individual characteristics although these are thought to cause estimation bias. To control for these, a panel data set needs to be used for estimations. That the local group defined in this work does not reflect the geographical scale, and so there is a possibility of measurement errors regarding the rate of homeowners in a locality, needs to be considered. This study was limited to Japan and the findings provided cannot be easily generalized. For the purpose of better verifying the generality of the arguments presented here, a study comparing results from other countries with different socio-cultural backgrounds would be required to be conducted using larger sample sizes. These are issues remaining to be addressed in future studies.

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Table 1

Variable definitions and descriptive statistics related to respondents to survey

Variables	Definition	Rate or mean
SC [a]	Takes 1 if one participates in the neighborhood association, otherwise takes 0.	0.35
HOME [a]	Takes 1 if one is a homeowner, otherwise takes 0.	0.76
AVHOME	Average value of HOME within an area. (Total HOME in the locality minus own HOME)/(Number of samples minus 1)	_____
MALE [a]	Takes 1 if a person is male, otherwise takes 0.	0.43
AGE [b]	Ages of respondents.	53.0
EDU [b]	Years of schooling of respondents.	11.6
MARRI [a]	Takes 1 if a respondent has a spouse, otherwise takes 0.	0.86
NCHILD	Number of children	1.72
MCITY [a]	Takes 1 if a respondent lives in medium-sized city, otherwise takes 0.	0.57
TOWN [a]	Takes 1 if a respondent lives in town and village, otherwise takes 0.	0.24
LAND75 [b]	Land price in the prefecture of one's current residence in 1975 (m^2).	14.6
APART75 [b]	Rental price of private apartment for a month in the prefecture of one's current residence in 1975 ($3.3m^2$).	0.51

Note: [a] Rate

[b] Mean values

[c] Thousands of yen

Table 2

Relationship between the rate of homeowners and that of participation in neighborhood association

	homeowner	SC
Large-sized city	0.53	0.30
Medium-size city	0.76	0.37
Town and village	0.91	0.37

Table 3

Determinants of investment for social capital: Probit model.

	(1)	(2)	(3)	(4)	(5)	(6)
HOME	0.08*		0.08*	0.09**		0.09**
	(2.16)		(2.01)	(2.71)		(2.60)
AVHOME		0.11	0.06		0.10	0.03
		(0.96)	(0.47)		(0.87)	(0.30)
MALE	0.04	0.04	0.04	0.06**	0.06**	0.06**
	(1.63)	(1.51)	(1.59)	(2.43)	(2.33)	(2.43)
AGE	0.001	0.001*	0.001	0.001	0.001	0.001
	(1.05)	(1.78)	(1.06)	(0.65)	(1.59)	(0.66)
EDU	0.02**	0.02**	0.02**	0.02**	0.02**	0.02**
	(3.95)	(4.23)	(3.99)	(4.31)	(4.61)	(4.33)
MARRI	0.22**	0.21**	0.22**	0.23**	0.22**	0.23**
	(4.10)	(3.94)	(4.09)	(4.88)	(4.68)	(4.86)
NCHILD	0.02*	0.02*	0.02*	0.02*	0.03**	0.02*
	(1.91)	(2.16)	(1.93)	(2.23)	(2.53)	(2.24)
MCITY	0.03	0.02	0.02	0.04	0.04	0.03
	(0.62)	(0.40)	(0.42)	(0.85)	(0.70)	(0.69)
TOWN	0.01	-0.01	-0.01	0.02	0.004	0.01
	(0.17)	(-0.24)	(-0.15)	(0.39)	(0.07)	(0.16)
Income dummy [a]	YES	YES	YES	NO	NO	NO
Area dummy [b]	YES	YES	YES	YES	YES	YES
Pseudo R- square	0.06	0.06	0.05	0.05	0.05	0.05
Sample size	1545	1545	1545	1693	1693	1693

Notes: Numbers are marginal effects. Numbers in parentheses are z-statistics calculated by using robust standard errors. Stata cluster command is used to address spatial autocorrelation within community members. Local areas consist of 105 groups which are identical to groups shown in Appendix (Table A1). A constant term is included when an estimation was conducted but its result is not reported to save space. * and ** indicate significance at 5 and 1 per cent levels, respectively.

a.YES means that dummy variables are included to control for annual income level, NO means that those are not included. There are 19 income's categories.

b.YES means that dummy variables are included to control for area specific effects, NO means that those are not included. There are 5 area's categories.

Table 4

Determinants of investment for social capital: Two-stage estimation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Second stage (Probit)				
HOME	0.80**		0.97**		0.91**		1.04**	
	(3.12)		(3.93)		(3.81)		(4.55)	
AVHOME		1.07		1.83**		0.94		1.73**
		(1.59)		(4.50)		(1.46)		(4.58)
MALE	0.05*	0.02	0.06*	0.009	0.07**	0.05*	0.07**	0.04
	(2.05)	(0.75)	(2.13)	(0.29)	(2.77)	(1.72)	(2.84)	(1.39)
AGE	-0.004*	0.001	-0.006**	0.001	-0.006**	0.001	-0.007**	0.001
	(-2.03)	(1.48)	(-2.67)	(1.28)	(-2.74)	(1.35)	(-3.30)	(1.12)
EDU	0.01	0.02**	0.01	0.02**	0.01*	0.03**	0.01	0.03**
	(1.58)	(4.39)	(1.26)	(4.68)	(1.75)	(4.76)	(1.48)	(5.06)
MARRI	0.29**	0.20**	0.30**	0.19**	0.30**	0.21**	0.31**	0.21**
	(4.58)	(3.74)	(4.84)	(3.60)	(5.70)	(4.44)	(5.95)	(4.33)
NCHILD	-0.001	0.03*	-0.007	0.03**	-0.07	0.03**	-0.005	0.03**
	(-0.10)	(2.28)	(-0.46)	(2.41)	(-0.10)	(2.60)	(-0.37)	(2.75)
MCITY	-0.07	-0.20	-0.09	-0.37**	-0.08	-0.16	-0.10*	-0.34**
	(-1.02)	(-1.30)	(-1.48)	(-3.51)	(-1.35)	(-1.04)	(-1.80)	(-3.30)
TOWN	-0.11	-0.31	-0.13*	-0.46**	-0.12*	-0.26	-0.14*	-0.44**
	(-1.41)	(-1.52)	(-1.88)	(-3.96)	(-1.72)	(-1.29)	(-2.14)	(-3.83)
Income dummy[a]	YES	YES	YES	YES	NO	NO	NO	NO
Area dummy[b]	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R- square	0.06	0.06	0.07	0.07	0.06	0.05	0.06	0.06
Sample size	1545	1545	1545	1545	1693	1693	1693	1693
				First stage (Dependent variable)				
	HOME *(Probit)*	AVHOME *(OLS)*			HOME *(Probit)*	AVHOME *(OLS)*		
LAND75	-0.002	-0.004*			-0.001	-0.003*		
	(-1.30)	(-2.12)			(-0.97)	(-2.01)		

	LRchi ^{2}=339.9 Prob> chi ^{2}=0	F=85.7 Prob> F=0			LRchi^2=383.2 Prob> chi ^{2}=0	F=218.4 Prob> F=0		
			HOME *(Probit)*	AVHOME *(OLS)*			HOME *(Probit)*	AVHOME *(OLS)*
APART75			-0.03* (-1.75)	-0.06** (-3.25)			-0.02 (-1.54)	-0.06** (-3.28)
			LRchi^2=341.2 Prob> chi ^{2}=0	F=93.5 Prob> F=0			LRchi^2=384.6 Prob> chi ^{2}=0	F=239.3 Prob> F=0

Notes: Numbers are marginal effects. Numbers in parentheses are z-statistics calculated by using robust standard errors. Stata cluster command is used to address spatial autocorrelation within community members. Local areas consist of 105 groups which are identical to groups shown in Appendix (Table A1). A constant term is included when an estimation was conducted but its result is not reported to save space. * and ** indicate significance at 5 and 1 per cent levels, respectively.

a. YES means that dummy variables are included to control for annual income level, NO means that those are not included. There are 19 income's categories.

b. YES means that dummy variables are included to control for area specific effects, NO means that those are not included. There are 5 area's categories.

Table 5 Determinants of investment for social capital: Probit model (two-stage).

	(1)	(2)	(3)	(4)	(5)	(6)
			Second stage (Probit)			
HOME	0.67**	0.68**	0.65**	0.81**	0.81**	0.79**
	(2.66)	(2.76)	(2.62)	(3.67)	(3.78)	(3.55)
AVHOME	1.31**	0.84*	1.44**	1.18**	0.55	1.32**
	(3.13)	(1.94)	(3.30)	(3.16)	(1.48)	(3.29)
MALE	0.03	0.04	0.02	0.05*	0.06**	0.05*
	(0.96)	(1.27)	(0.85)	(2.00)	(2.33)	(1.92)
AGE	-0.004*	-0.004*	-0.004*	-0.005**	-0.005**	-0.005*
	(-1.80)	(-1.82)	(-1.78)	(-2.73)	(-2.69)	(-2.64)
EDU	0.01*	0.01*	0.01*	0.01*	0.01*	0.01*
	(2.17)	(2.03)	(2.25)	(2.30)	(2.14)	(2.40)
MARRI	0.27**	0.27**	0.26**	0.29**	0.29**	0.29**
	(4.16)	(4.25)	(4.10)	(5.38)	(5.46)	(5.31)
NCHILD	0.006	0.004	0.006	0.004	0.003	0.005
	(0.37)	(0.27)	(0.42)	(0.30)	(0.21)	(0.38)
MCITY	-0.36**	-0.25**	-0.38**	-0.34**	-0.20*	-0.37**
	(-3.53)	(-2.35)	(-3.69)	(-3.47)	(-1.97)	(-3.61)
TOWN	-0.43**	-0.33**	-0.45**	-0.42**	-0.27*	-0.44**
	(-3.73)	(-2.52)	(-3.87)	(-3.71)	(-2.13)	(-3.82)
Income dummy [a]	YES	YES	YES	NO	NO	NO
Area dummy [b]	YES	YES	YES	YES	YES	YES
Pseudo R- square	0.07	0.07	0.07	0.06	0.06	0.07
Sample size	1545	1545	1545	1693	1693	1693
			First stage			
			Dependent variable =HOME: (*Probit)*			
LAND75	-0.0008	0.01		-0.0004	0.01	
	(-0.28)	(1.10)		(-0.14)	(1.29)	
LAND75 [2]		-0.0003			-0.0003	
		(-1.52)			(-1.66)	
APART75	-0.02		0.005	-0.02		0.002
	(-0.79)		(0.05)	(-0.77)		(0.02)
APART75 [2]			-0.008			-0.006

			(-0.38)			(-0.31)
	LRchi^2=341.4 Prob> chi ^{2}=0	LRchi^2=343.6 Prob> chi ^{2}=0	LRchi^2=341.4 Prob> chi ^{2}=0	LRchi ^{2}=348.6 Prob> chi ^{2}=0	LRchi^2=388.0 Prob> chi ^{2}=0	LRchi ^{2}=384.7 Prob> chi ^{2}=0
	Dependent variable =AVHOME: *(OLS)*					
LAND75	-0.001	0.01		-0.001	0.01	
	(-0.44)	(1.44)		(-0.39)	(1.55)	
LAND75 ^{2}		-0.0004*			-0.0004*	
		(-2.15)			(-2.26)	
APART75	-0.05		-0.09	-0.05*		-0.09
	(1.64)		(-1.26)	(-1.70)		(-1.22)
APART75 ^{2}			0.008			0.007
			(0.45)			(0.41)
	F=91.4 Prob> F=0	F=89.9 Prob> F=0	F=90.9 Prob> F=0	F=224.6 Prob> F=0	F=221.6 Prob> F=0	F=223.7 Prob> F=0

Notes: Numbers are marginal effects. Numbers in parentheses are z-statistics calculated by using robust standard errors. Stata cluster command is used to address spatial autocorrelation within community members. Local areas consist of 105 groups which are identical to groups shown in Appendix (Table A1). A constant term is included when an estimation was conducted but its result is not reported to save space. * and ** indicate significance at 5 and 1 per cent levels, respectively.

a. YES means that dummy variables are included to control for annual income level, NO means that those are not included. There are 19 income's categories.

b. YES means that dummy variables are included to control for area specific effects, NO means that those are not included. There are 5 area's categories.

APPENDIX

Table A1 Rates of homeowners

	Prefecture	total	large	medium	Town and village
1	Hokkaido	0.66	0.49	0.70	0.80
2	Aomori	0.91		0.87	1
3	Iwate	0.82		0.80	0.85
4	Miyagi	.78	0.63	0.83	0.89
5	Akita	0.91		0.86	0.98
6	Yamagata	0.93		0.94	0.90
7	Fukushima	0.87		0.88	0.84
8	Ibaragi	0.83		0.74	0.96
9	Tochigi	0.85		0.81	0.92
10	Gunma	0.88		0.86	0.92
11	Saitama	0.73	0.61	0.70	0.92
12	Chiba	0.75	0.53	0.76	0.85
13	Tokyo	**0.50**	0.47	0.58	
14	Kanagawa	0.66	0.63	0.68	0.72
15	Niigata	0.94		0.91	0.99
16	Toyama	0.97		0.97	0.97
17	Ishikawa	0.81		0.81	0.81
18	Fukui	0.92		0.90	1
19	Yamanashi	0.90		0.92	0.88
20	Nagano	0.93		0.91	0.95
21	Gifu	0.90		0.88	0.95
22	Shizuoka	0.83		0.82	0.85
23	Aichi	0.70	0.36	0.77	0.93
24	Mie	0.92		0.89	0.98
25	Shiga	0.81		0.73	0.92
26	Kyoto	0.82	0.71	0.96	0.88
27	Osaka	**0.51**	0.40	0.53	0.93
28	Hyogo	0.70	0.62	0.68	0.92
29	Nara	0.76		0.66	1
30	Wakayama	0.82		0.79	0.87
31	Tottori	0.70		0.56	1
32	Shimane	0.80		0.62	1
33	Okayama	0.88		0.87	0.94
34	Hiroshima	0.82	0.71	0.88	0.87
35	Yamaguchi	0.81		0.75	0.96
36	Tokushima	0.86		0.76	0.95
37	Kagawa	0.94		0.90	1
38	Ehime	0.81		0.76	0.90
39	Kochi	0.82		0.74	0.92
40	Fukuoka	0.68	0.44	0.78	0.91
41	Saga	0.80		0.64	0.94
42	Nagasaki	0.65		0.65	0.64
43	Kumamoto	0.82		0.75	0.92
44	Oita	0.79		0.76	0.84
45	Miyazaki	0.87		0.83	1
46	Kagoshima	0.75		0.70	0.81
47	Okinawa	0.57		0.43	0.85

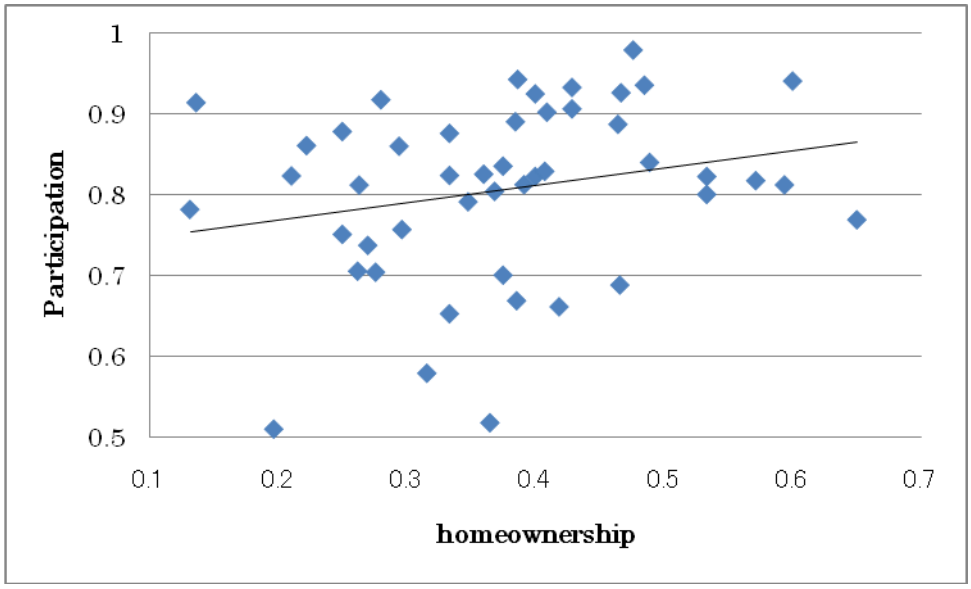
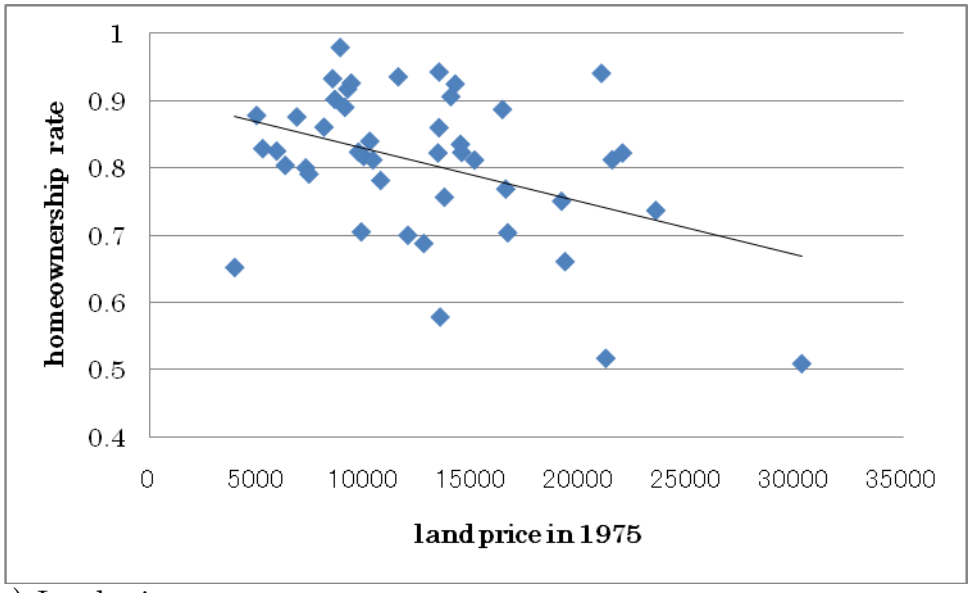
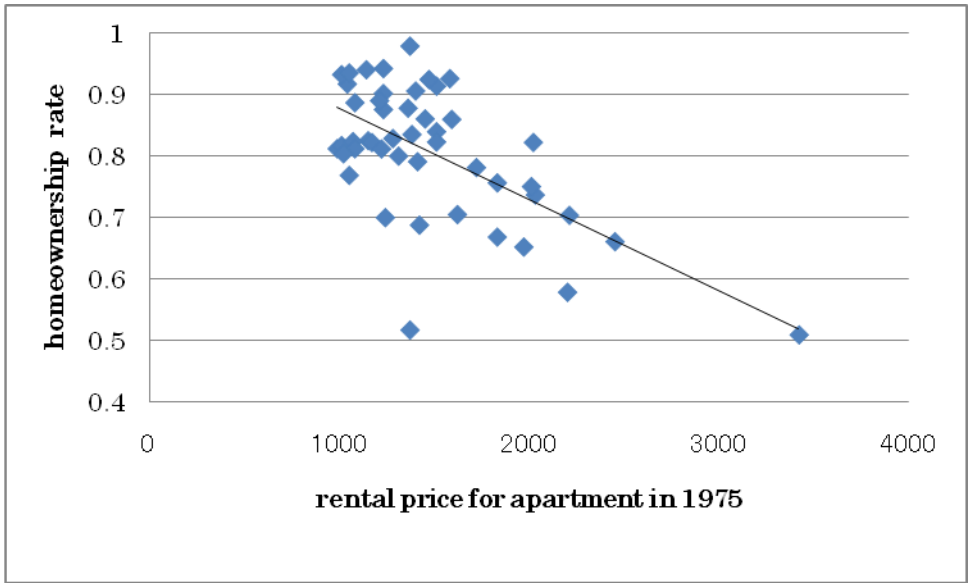


Figure1. Relationship between homeowner rates within an area and investment of social capital



(a) Land price



(b) Rental price for an apartment

Figure2. Relationship between land price (rental price for an apartment) and the homeowner rate