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Effects of social norms and fractionalization on voting behavior in Japan

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Abstract

This paper uses prefecture-level panel data from Japan, spanning the period 1989–2003, to examine the influence of social norms and fractionalization on voting behavior. The key findings obtained from analysis via the fixed effects estimation, which controls for unobserved prefecture-specific fixed effects, are as follows: (1) the voter turnout is higher in close-knit communities, indicating that social norms enhance voting; (2) fractionalization, from both economic and generational standpoints, lowers the voter turnout; and (3) a lack of social capital can lead to the distribution of votes being spread thinly among the competing parties.

Running title: Voting behavior

Keywords: Voter turnout · Distribution of votes · Social norms · Fractionalization

JEL Codes D70, D72, Z13

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I. INTRODUCTION

Literature in the field of social science is increasingly concerned with the influence of social heterogeneity on various human behaviors such as trust (Alesina and La Ferrara, 2002; Bjørnskov, 2006; Leigh, 2006 a, b), conflict (Montalvo and Reynal-Querol, 2005), redistribution (Lind, 2006), leaning from neighbors (Yamamura, 2008a) and collective action (Alesina et al., 1999; Alesina and La Ferrara, 2000; Costa and Kahn, 2003; La Ferrara, 2002; Miguel and Gugerty, 2005; Vigdor, 2004, Yamamura, 2008b). It is acknowledged that a socially and culturally homogeneous society can produce cohesiveness and collective action; the gaining of a benefit from collective action is a common result within society (Vigdor, 2004, Yamamura, 2008b). Kaniovski and Mueller (2006) attempted to explore how heterogeneity affects voter turnout, and found that linguistic heterogeneity has a significant negative effect on voter turnout.

The fact that the attitudes and conduct of others can influence a person's behavior is evident among neighbors and colleagues in schools and workplaces (Manski, 1993). This interactive mechanism also applies to a person's voting behavior (Calabrese et al., 2006; Nelson, 1994). Interactions among people, through conversations and discussion concerning an election, can work alongside publicized election information to draw attention to the election, thereby causing people to vote: a person is more likely to vote if those around them are interested in the election. Furthermore, people appear to have a greater tendency to consider voting as a civic duty in a society in which political activity is pervasive. Such an interactive mechanism is plausibly associated with the cohesiveness of society (Putnam, 2000). Knack (1992) considered voter participation as a form of collective action and suggested that voter turnout in large elections is positively associated with the social norm via social sanctions.

If a person does not participate in a community activity that is beneficial to the community as a whole, he or she may feel embarrassed and thereby experience the psychological cost of not participating in the activity. The psychological cost of failing to vote depends on voting social norms that are shaped by local interactions (Funk, 2005; 2007). For example, neighborhood watch is likely to be more effective if the community members are closely related. Individuals prefer to interact with others who are similar to themselves in terms of features such as income, generation, and race (Alesina and La Ferrara, 2000). The cost of not voting is therefore higher in a relatively homogeneous community. As suggested above, social cohesiveness and heterogeneity appear to play a crucial role in voting behavior. Nonetheless, little is known about the mechanism of voting behavior in a relatively racially homogeneous society such as Japan¹.

The degree of heterogeneity of a social structure can be considered not only from a linguistic viewpoint (Kaniowski and Mueller, 2006) but also from generational and economic viewpoints; however, few researchers have addressed the impact of economic and generational heterogeneity upon voting behavior.

The process of voting can be described as follows. First, an individual might be interested in a candidates or particular issues². Second, he or she might assess the net benefit of voting and then determine whether or not to vote. As such, voting behavior is a two-step system, yet few studies analyze voting behavior in this way; consequently, the aim of this paper is to ascertain the determinants of voting participation and the distribution of votes among the competing parties.

¹ The proportion of Japanese within the population of Japan is 99% (Asahi shinbunsha, various years).

² For instance, it is widely acknowledged that the question of voter reaction to tax changes has been a central concern (Gibson, 1994).

Until now, cross-section estimations have been used to investigate voting behavior, but it appears that these types of estimation results omit variable bias due to unobserved individual specific effects. Jordahl (2006) attempted to assess the determinants of voting behavior after controlling for unobservable fixed effects using panel data from Sweden. Following these results, the present study uses prefecture-level panel data from Japan and employs fixed effects estimations³ to ascertain the determinants of the voter turnout and distribution of votes. It is also important to consider whether the outcomes of policy reflect the individual vote and the extent to which a vote being cast is dependent upon the degree of political representation, measured by the per capita representation. For this reason, political representation is taken into account to avoid omitted variable bias (Atlas et al., 1995; Meyer and Naka, 1999). Nevertheless, the index of political representation is affected by institutional and demographic change and is therefore flawed. To remove this bias, Kawaura's (2003) relative representation index is used.

The remainder of this paper is organized as follows. A literature review is presented in Section II. Section III surveys voting in Japan and advances a testable hypothesis. Section IV presents a simple econometric framework, and Section V discusses the results of the estimations. The final section offers concluding observations.

II. RELATED LITERATURE

Since the seminal work of Downs (1957), a number of researchers have

³ A number of researchers have employed fixed effects model to examine the relationship between resource allocation and legislative representation (Atlas et al., 1995; Meyer and Naka, 1999; Kawaura, 2003).

attempted to investigate the paradox of election turnouts in which people vote even though their marginal gain is zero (e.g., Greene and Nikolaev, 1999; Matos and Barros, 2004; Kaniovski and Mueller, 2006). To help explain this paradox, Downs (1957) stated that social factors such as a civic duty embed the individual in a social relationship, thereby resulting in such actions.

Matos and Barros (2004) considered each individual as an element of a social network, and suggested that ethical values or social norms might influence the direction of an individual's voting attitude. This view supports the argument that voting turnout will be higher in cases of stronger interpersonal interactions and stronger community networks (Uhlaner, 1989). Taking both individual rationality and social network into account, the extent of an individual's voting participation depends on their personal characteristics, including education, income and property, and the features of the community to which he or she belongs, such as social norms, heterogeneity, and degree of economic inequality.

Earlier reports on the subject (Coleman, 1990; Shachar and Nalebuff, 1999) have stated that the interpersonal pressure to vote, depending on the social norm or a social network, is the critical determinant of voting participation. Put more precisely, the cost of social sanctions from co-citizens provide an incentive to vote as a civic duty (Knack, 1992; Opp, 2001). Table 1 summarizes the findings of Knack (1992) using Logit estimation showing that a churchgoer is more likely to vote while a newcomer is less likely to, which reflects the degree that individuals are integrated into a community and how they perceive pressure from other community members.

As suggested in the case of the participation of various communities (Alesina et al., 1999; Costa and Kahn, 2003), it seems appropriate to expect heterogeneity to

undermine collective action and thereby cause people to not vote. This would hold in the case of economic fractionalization, namely inequality (Alesina and La Ferrara, 2000; La Ferrara, 2002), and generational heterogeneity (Vigdor, 2004)⁴. The accumulated evidence is consistent with the assertion presented by Uhlaner (1989) that voting turnout will be higher when groups have higher levels of unanimity with regard to the candidates. As indicated in Table 1, the recent work of Kaniovski and Mueller (2006) used data for voter turnouts at a Norwegian school and made it evident through OLS and conditional median regression that the Herfindahl index of linguistic heterogeneity is negatively related to voter turnouts. The size of the electorate also has a negative influence on voter turnouts. The reason why, they argued, is that community size is related to the extent of heterogeneity in the community. Earlier research indicated that the electoral and voting systems affect voter turnout (Ansolabehere and Konisky 2006; Blais 2006). Funk (2007) assumes that community size is negatively related to the benefits that stem from avoidance of informal sanctions and so predict based on a signaling model that outcomes of voter turnout might be affected by the voting system. Consistent with the prediction, Funk presented evidence that voter turnout was more decreased in smaller communities after introduction of optional postal voting in Switzerland.

III. REVIEW OF VOTING IN JAPAN

General view

⁴ Barreto et al (2004) used the individual-level turnout data in counties of the USA to examine how the component ratio of society has a effect on turnout. They found that residing in a majority-Latino district has a positive influence on Latino voter turnout; by contrast, there was a negative impact on non-Hispanic voter turnout.

The National Assembly of Japan is made up of the House of Representatives, termed “Shugi-in”, and the House of Councilors, known as “Sangi-in”⁵. The system employed to elect the House of Representatives is a combination of the single-member constituency system⁶ and proportional party representation⁷. A proportion of the members from the House of Councilors are also elected using proportional representation; the remaining members are decided using a system whereby 2–8 seats are allocated to each prefecture. In general terms, members are elected from small districts using the single-member constituency system and elected from the nationwide constituency using proportional representation.

Data concerned with the results of the House of Representatives election are available separately for the single-member constituency and the proportional party representation. This study focuses upon collective action in the smaller districts and is not concerned with the outcomes of proportional representation. The following analysis is limited to the election of the House of Representatives.

Table 2 outlines the current voting trends in Japanese elections⁸. The first column shows temporal changes in the representation index, which illustrates the effect of an individual vote on the outcome of an election⁹. The values are declining

⁵ There are three types of elections in Japan: A General Election of the House of Representatives, Elections of the House of Councilors, and Local Elections.

⁶ In the single-member constituency system, each seat is allocated to an electoral district. The mixed-system took effect in the House of Representative during the 1996 election. Prior to 1996, the multi-member constituency system was used, with few seats being allocated. For further details of legislative representation, see Kawaura (2003), Meyer and Naka (1998, 1999).

⁷ The proportional representation rule states that a party gains seats in proportion to the number of total votes for the party.

⁸ I used data from the 1990 and 1993 elections, which were based upon the multi-member constituency system, as well as data from the 1996, 2000, and 2003 elections, based upon the single-member system.

⁹ Following the relevant literature (Atlas et al., 1995; Meyer and Naka, 1999), the representation index for prefecture i during year t is defined as follows:

over time, meaning that the impact of an individual vote is gradually decreasing. As noted by Kawaura (2003), the index is affected by changes in the number of legislators and the demography of voters. The marked difference in values between 1993 and 1996 appears to reflect a change in the electoral system from the multi-member constituency system to the mixed system. With the aim of controlling for institutional change, the relative representation index is shown in the second column¹⁰. This index is more stable over time. The third column records the fact that turnout has fallen steadily over time. Controlling for change in the electoral system, the combined results indicate that the impact of the individual's vote is not related to voter turnout. Column 4 reveals that the distribution of votes among the parties, as measured using the Herfindahl index, has become less dispersed over time. That is, votes have gradually become increasingly concentrated; therefore, the disparity of votes is likely to become more apparent.

In Japan, it is widely accepted that the ruling Liberal Democratic Party (LDP) has relied upon the agricultural sector for strong electoral support (Hayami and Godo, 2002)¹¹. That is, a reliable source of votes for the LDP is the agricultural cooperative. The Diet members of the LDP have established a large voting constituency in rural areas. Given that other parties also regard the support of the agricultural sector as being of utmost importance, the agricultural cooperative wields a tremendous amount of political power (Hayami and Godo, 2002). In other words, both the LDP and other

$$\frac{\text{Number of Seats}_{it}}{\text{Number of Population}_{it}}$$

¹⁰ Kawaura (2003) defined the Representation index as follows:

$$\frac{\text{Number of Seats}_{it}}{\text{Number of Population}_{it}} \bigg/ \frac{\sum \text{Number of Seats}_{it}}{\sum \text{Number of Population}_{it}}$$

¹¹ Since World War II, the LDP has governed every year except 1993 and 1994.

parties are likely to be influenced by the agricultural cooperative¹².

An additional feature of the Japanese electoral system is that candidates rely heavily upon the “JIBAN”, which is a strongly supportive network limited to a particular area and used to gain the majority of the candidate’s votes (Miyake, 1989). Under an electoral system with a geography-based constituency (as in Japan), the local voter’s interest and benefit are crucial in terms of improving a politician’s chances of re-election. Each party attempts to direct budgetary resources into constituencies to maintain electoral position (Kawaura, 2003; Meyer and Naka, 1998, 1999). The supportive network “JIBAN” is made up of close-knit community members who are seeking to gain benefits through the election of their candidate. In other words, a reciprocal relationship is formed between the candidate and the electorate, with the aim of a successful candidacy, via long-term personal interactions. If a member does not vote or votes for other candidates, he or she is ostracized by the other members. When taking into account the long-term relationship within such a community, the cost of exclusion from the community is tremendously high (Hayami, 2001). Accordingly, the network informally requires that community members take collective action; that is, vote for the community’s candidate. This implies that social norms are indirectly associated with a cost-benefit analysis in terms of economics¹³.

Theoretical Framework and Testable Hypotheses

The economic model of voting decision holds that a rational individual computes

¹² It is generally acknowledged that LDP is a rural-based party (Meyer and Naka, 1998; Curtis, 1988; Reed, 1986); this is in line with the LDP’s strong ties to the agricultural cooperative.

¹³ The existing literature considers social norms or ethics as a psycho/sociological factor, and distinguishes them from rational decision making (e.g., Downs, 1957; Matsusaka and Palda, 1999).

expected benefits (EB) from voting and the direct cost of voting(C), and then votes only when expected benefits exceeded the cost¹⁴. The benefit-cost ratio becomes:

$$\frac{EB}{C}.$$

If one were to make a decision based on a benefit-cost calculation, few people would vote since their behavior would hardly affect the outcome of an election and therefore the expected benefit becomes very small. Nevertheless, actually, voter turnouts are inconsistent with this model. To account for actual voter turnout, many of works have been compiled and reported. The social pressure to vote, which is not taken into account in the rational voter model, appears to provide an incentive to vote. (Knack 1992; Schram and van Winden 1991; Funk 2006). To extend the rational voter model as above, Tollison and Willet (1973) provided a simple model that incorporated “sociological” benefits (SB), which come from the satisfying of a felt obligation or duty and response to social pressure to vote, into the benefit-cost calculation. According to his model, the benefit-cost ratio becomes:

$$\frac{EB + SB}{C}.$$

Recently, Funk (2006) developed a more sophisticated model where benefits come from social esteem from showing up at the voting booth, the avoidance of social sanctions, or being perceived as social cooperator. Funk argued that such effects are larger in more closely-knitted communities since “people know each other and gossip about who does do their civic duty and who does not” (Funk 2007, p.2). This paper assumes that individuals vote because they are expressing themselves to raise the sociological benefits within a community and then applies the framework of Tollison

¹⁴ The direct cost is affected by the voting system. For instance, voter registration raises the cost of voting, resulting in a decrease in turnout (Ansolabehere and Konisky 2006).

and Willete (1973) to the empirical analysis¹⁵.

As discussed in the previous section, the interpersonal pressure to vote seems to be negatively associated with the decay of social norm. Furthermore, more homogeneous societies are more closely knitted through interpersonal interactions, leading to the stronger pressure to vote. Lower pressure is expected to decrease “sociological” benefits (SB). Following this, I raise Hypothesis 1 concerning the affect of social norms on voting.

Hypothesis 1: Decay of norms and fractionalization result in a lower voter turnout.

The supportive network of the candidate is required to engage in collective action within the community, and is therefore more likely to be shaped to do so in a more organized society due to an abundant social capital (Putnam, 2000). In other words, the supportive networks are less likely to be cohesive when the social norm is highly undermined. For this reason, votes are less likely to given to the community-supported candidate when the social norm is less enforceable.

Putnam (2000) reports that the level of interest in political issues in the USA is distinctly different between generations. This tendency is also observed in Japan (Miyake, 1989). Although one of the characteristics of Japanese society is homogeneity in terms of race, this does not hold when heterogeneity is considered from an economic or generational viewpoint. Therefore, it is worth investigating

¹⁵ According to the expressive voting model, “individuals vote because they are expressing themselves about the candidate(s) and /or issues, not because they expect to alter the outcomes of the election.” (Copeland and Laband 2002, p.352). The expressive voting model shares the similarity with the model this paper based on (Copeland and Laband 2002; Cebulla 2004).

generational and economic heterogeneity in Japan.

In an election, a candidate declares campaign pledges that purport to benefit their supporters, all with the view of winning the election; however, they are likely to encounter difficulties in gaining the desired votes in a more heterogeneous community, as the interests of voters will be fractionalized. In other words, members' interests appear to be more alike in less heterogeneous communities, enabling candidates to design campaign pledges that gain the support of the majority. From the viewpoint of voters, a heterogeneous community is likely to experience a diverse range of campaign pledges among the candidates. As a result, voters will not concentrate on a particular candidate, making for a close election. In the case that the social norm is less rigorous or the community is heterogeneous, voters will not feel compelled to vote for the candidate whom their community supports. Based on this argument, I propose the following empirical hypothesis concerning the distribution of votes among parties.

Hypothesis 2: A generational fractionalization and the decline of social norms will result in votes being distributed widely among parties

IV. MODEL

Data

The data used as independent variables in the regression estimation were mostly sourced from the Asahi Newspaper (various years). The three exceptions were Gini Coefficient, number of farmers and the number of people who have graduated from university. The Gini coefficient of per capita income was sourced from the

Statistics Bureau of the Ministry of Internal Affairs and Communications. The number of farmers was obtained from Index Corporation (2006). The data of the number of graduates came from the Ministry of Internal Affairs and Communications, and the Ministry of Education, Culture, Sports, Science and Technology.

As mentioned in Section II, this study presents outcomes from smaller districts and not to those of proportional representation. Data is, therefore, limited to the election of the House of Representatives¹⁶. The data are panel-structured, consisting of 47 prefectures and the date of the election year (1990, 1993, 1996, 2000, 2003)¹⁷. Hence, the raw data set includes various prefecture-level data on various variables. Gini coefficient data are scarce and can only be obtained every five years; for example, 1989, 1994, 1999, and 2004, meaning that Gini data were not available for the election years used in this study. To conduct the estimations, additional Gini data were generated by interpolation based on the assumption of constant changing rates between 1989 and 1994, 1994 and 1999, and 1999 and 2004.

Population Census (various years), as published by the Ministry of Internal Affairs and Communications, provided the numbers of people who graduated from universities every 10 years; for 1980, 1990 and 2000. The data were generated by interpolations based on the assumption of constant changing rates between 1980, 1990 and 2000. The data of 2002 was calculated by adding the annual number who graduated from university of 2001 and 2002 to 2000 data. The annual data of 2001 and 2002 was collected from the Basic Report for Schools (various years) published by

¹⁶ In this study, local elections are not considered.

¹⁷ Kaniovski and Mueller (2006) stress that data from a small electoral district must satisfy the criterion that the probability of a vote being decisive is close to zero. It should be noted that the size of the prefecture considered in the present paper is too large to satisfy this criterion.

the Ministry of Education, Culture, Sports, Science and Technology. .

Table 3 lists the descriptive statistics for all of the variables used in the regression estimation.

Econometric framework

To test the hypotheses raised in the previous section, I first examined how the social norm and social heterogeneity played a role in voting participation. I then considered whether they affect the concentration of votes to a particular party. The estimated function takes the following form:

$$\begin{aligned}
 VOTE_{its} = & \alpha_1 DSN1_{it-1} + \alpha_2 DSN2_{it-1} + \alpha_3 GINI_{it-1} + \alpha_4 HETGEN_{it-1} + \alpha_5 RI_{it-1} \text{ (or } \\
 & RRI_{it-1}) + \alpha_6 AGRI_{its-1} + \alpha_7 OWHOUS_{it-1} + \alpha_8 INCOM_{it-1} + \alpha_9 SINGL_{its-1} + \alpha_{10} UNIV_{it-1} \\
 & + \alpha_{11} VOTR_{it-1} + v_i + u_{it},
 \end{aligned}$$

where $VOTE_{its}$ represents the dependent variable, a voting rate, in prefecture i , t is the year in which the election was held, s is the sex of the voter, and α values represents regression parameters. Lagged values of all independent variables are used to control for endogeneity bias. In other words, all independent variables are the value for year $t-1$ ($t = 1990, 1993, 1996, 2000, \text{ and } 2003$, and $t-1 = 1989, 1992, 1995, 1999, \text{ and } 2002$). v_i, u_{it} represent the individual effects of i 's prefecture (a fixed effects prefecture vector) and an error term respectively. v_i is a time-invariant feature, while u is an error term. Special attention must be paid to the omitted variable bias stemming from unobservable individual specific effects. This can be controlled for via fixed effects estimation (Baltagi, 2005). In an attempt to estimate

the elasticity for comparing the magnitude of dependent variables, the function takes a linear form¹⁸. Accordingly, with the exception of dummy variables, dependent and independent variables are evaluated at the sample means, and therefore the coefficient values reported can be interpreted as elasticity¹⁹.

As shown in Table 3, it is noteworthy that the female voting rate is larger than that for males. My interpretation is that this can be partly explained by expressive voting since females are more likely to express that their right to vote is equivalent to that of males.

Matusaka and Palda (1999) propose that social norms are constant over time. Further, they suggested that voter turnout can be explained by a time-varying variable; therefore, time-invariant social norms cannot account for voting behavior. However, by employing fixed effects estimation, proxies present in this research can be used to estimate the effects of social norms on voting behavior, even after controlling for time-invariant features.

When estimating the determinants for the concentration of votes, the function form is the same as that shown above; however, the determinants cannot be obtained separately for male and female due to the limitations of the data. Therefore, the

¹⁸ Unfortunately, there is no theoretical model supporting the linear form. It is beyond the scope of this paper to theoretically justify the function form. This is an issue remaining for future study.

¹⁹ See more details for Greene (Greene1997, p.280).

In the linear model, $y = x' \beta + e$ the elasticity of y with respect to changes in x is

$$\gamma_k = \frac{\partial \ln y}{\partial \ln x_k} = \beta_k \left(\frac{x_k}{y} \right).$$

This values can be estimated by them at the sample means as

$$\lambda_k = \beta_k \left(\frac{\overline{x_k}}{\overline{y}} \right).$$

The standard error of the elasticity of y , γ_k , can be calculated by the delta method (Greene 1997, pp. 278-280).

sample size is 235, being half of those who voted (470). Furthermore, concerning *AGRI* and *SINGL*, to capture the feature of sex, I estimate not only the model using an aggregated value, but also ones using male and female values, respectively.

Proxies for social norms

The variables are discussed in this section of the paper, along with a description of the social norm that creates an informal social pressure concerning voting behavior. The cost of not taking collective action, namely free riding, depends on the social norms that are shaped by local interactions (Funk, 2005). Individuals are less likely to engage in collective action where the expectation of being ostracized by community members is lower due to a disorganized community and weak social norms.

According to Putnam (2000), social disorganization can be regarded as the engine of free riding, as such disorganization undermines social norms. It appears to be difficult to enhance collective action in areas in which population turnover is high, neighbors remain anonymous, and local organization is rare. The degree to which a person is integrated into their community depends upon the condition of the community. As argued by Putnam (2000), people that shift frequently have weaker ties within the community, meaning that mobile communities seem to have less interaction among neighbors than that in more stable communities. In other words, the more mobile a community, the less cohesive it becomes²⁰. Hence, *DSN1* and *DSN2*, denoting population turnover within a prefecture and the number of immigrants from

²⁰ Also of importance is the individual's plans to move from the present constituency soon after the election, as the expected long-term benefit of voting will be reduced in such a case (the Japanese electoral system is based on geographical-based constituencies). In contrast, the likelihood of a person voting increases with the length of time spent at the current address (Wolfinger and Resenstone, 1980). It follows from this that individuals scheduled to move will not vote.

other prefectures, respectively, can be considered as proxies for a decline in social norms. Accordingly, these coefficients are predicted to become negative when the voting participation rate is examined. It therefore seems reasonable that the supportive network for a candidate will become weaker within a mobile society. Following from this, it can be expected that the signs for *DSN1* and *DSN2* will become positive when their impacts on the distribution of votes among the parties are tested.

Fractionalization

As discussed in the previous section, the sign of *GINI*, representing the Gini coefficient, represents economic inequality²¹. *GINI* will be negative, as income inequality is expected to lower voting participation rates. *HETGEN*, denoting a Herfindahl-type index of age heterogeneity, is considered as a proxy for the degree of heterogeneity in age. *HETGEN* will also become negative, as fractionalization will lead to a reduction in the voting participation rate due to declining collective action²². Furthermore, if Hypothesis 2 is valid, the signs will become positive in the estimation of the distribution of votes.

²¹ It should be noted that the Gini coefficient is associated with various disadvantages as a measure of inequality. For instance, ‘it is useful to be able to decompose inequality into “between” and “within” components...the Gini coefficient is not decomposable, or at least not without hard-to-interpret residual terms’ (Deaton 1997, p.140).

²² Following the general index of fractionalization (Alesina and La Ferrara, 2002), fractionalization (heterogeneity) can be written as

$$FRA = 1 - \sum_{i=1}^I \left(\frac{n_i}{N}\right)^2$$

Where n_i is the number of people in the i^{th} age group, N is the population, and I is the number of age groups in the prefecture. Age groups are divided into 5-year categories, from 0–4 years to 80 years and over. There are 17 categories in total (I is 17).

Representation index

RI represent per capita political representation in the Legislature; that is, the representation index. The existing literature provides evidence that per capita transfers from central to local governments are positively associated with *RI* (Atlas et al., 1995; Meyer and Naka, 1999). Inevitably, *RI* is also seen to represent the influence of voters upon the allocation of resources; however, it is more accurate to state that the degree of such transfer depends on voting participation, as the allocation of resources will not reflect voters' interests if people do not vote. In other words, political influence is potentially brought about through voting participation. If a voter has the potential to politically influence the likelihood of any benefits, then people will be more inclined to vote in order to realize this potential and reap any benefits. As a consequence, *RI* is expected to take a positive sign when voting participation is examined.

To control for a bias in *RI* arising from changes in demography and size of the Legislature, Kawaura (1999) developed *RRI*, the relative representation index. In fact, as discussed above, annual changes in *RI* and *RRI* can be marked, presumably due to institutional changes such as a change in the number of seats. Therefore, both *RI* and *RRI* are incorporated to capture the degree of benefits of voting participation²³.

Control variables

As stated above, the agricultural sector of Japan has a tremendous influence over the allocation of budgetary resources through their interest groups such as the

²³ Previous studies used population as a denominator (Meyer and Naka, 1999; Kawaura, 2003). To avoid measurement error, I replaced population with the number of people entitled to vote; however, the estimation results presented below are unchanged when calculated using the indices employed in previous studies.

agricultural cooperative (Meyer and Naka, 1998). The agricultural sector's political power arises from its ability to encourage its members to vote. That is, the members of the agricultural sector have a strong incentive to vote, as the benefit of doing so outweighs any cost. For this reason, the predicted sign of *AGRI*, representing the number of farmers, is positive for voting participation. In addition, the LDP is indebted in part to the agricultural sector for being voted in as the ruling party. From this, the inference can be made that members of the agricultural sector have a tendency to vote on a reciprocal basis with LDP members, resulting in a concentration of votes²⁴. As such, the sign of *AGRI* is predicted to be negative when the distribution of votes is examined.

OWHOUS and *INCOM*, representing the rates of home owners and per capita income, respectively, are the control variables used to capture the economic conditions. DiPasquale and Glaeser (1999) argued that homeowners have an incentive to improve the community in which they live to protect their investment; home ownership is a barrier to moving out. This argument leads to the prediction that being a homeowner increases the desire to improve the community by voting. The value of time spent in voting will generally be greater for higher than for lower income individuals. Hence, simple economic theory would indicate that there would be less voting by higher income individuals because of the higher cost to them. On the other hand, Frey (1971) argues that voters with high-income jobs will receive higher-quality electoral information; this in turn will induce them to vote²⁵. More precisely, individuals with

²⁴ According to Schram (1992), social groups appear to play an important role in the choice of party (schram 1992, p428).

²⁵ Recent works support the positive effect of income (Greene and Nikolaev, 1999; Barreto et al., 2004). This is in line with the results of cross-national studies (Blais, 2006).

larger human capital can receive the higher income, indicating that high-quality information would be as a result of the large human capital, rather than the high income. Accordingly if the human capital effect is controlled for as shown in the function, *INCOM* will take a negative sign in estimating voters' participation. *SINGL* and *UNIV* are the number of single individuals and people who graduated from university, respectively. Those who are married and living with spouses can share the costs of voting, such as going to the poll booth. *SINGL* will take the negative sign in the estimation of voting participation²⁶. According to existing reports (Campbell et al. 1960; Greene and Nikolaev 1999; Nie et al. 1996; Wolfinger and Rosenstone 1980), a tertiary education makes people more likely to vote. *UNIV* is incorporated to include the human capital effects. Only *AGRI* and *SINGL* can be obtained separately as male and female; therefore, other independent variables take the same value for male and female.

V. RESULTS

I prefer the model using *RRI* to *RI* since *RRI* is modified index as mentioned in the previous section. Further, in order to capture the difference between male and female, I prefer the model incorporating *MALE DUMMY* in Table 4 and ones using male and female values for *AGRI* and *SINGL* in Table 5. Therefore, the result presented in column (4) is the most preferable in Table 4 and 5.

Results of voter turnout

²⁶ Wolfinger and Rosenstone (1980) assert that married people are more likely to vote than single people.

Both Tables 4 and 5 list the results of the fixed effects estimations. Table 4 presents the results concerning voting participation, while the results regarding the distribution of votes are listed in Table 5. As mentioned earlier, the values are elasticity, and those in parentheses are t-values calculated using the delta method. The results of a Hausman test, which is concerned with the null-hypothesis that there is a systematic difference between the fixed and random effects estimators, is presented in the bottom row. 'Yes' suggests that there is systematic difference between the models. This means that the fixed effects model can be justified in all cases; therefore, it is employed instead of the random effects model (Hsiao 1986).

This section concentrates on the results presented in Table 4. With respect to the decline in social norms, both *DSN1* and *DSN2* are close to displaying the significant negative signs predicted in the previous section. This tells us that a decline in social norms has resulted in people not voting. As for economic and generational heterogeneities, the signs for *GINI* and *HETGEN* are consistently negative and almost statistically significant. As a whole, the coefficients on norms and fractionalization are very stable and robust against differing specifications. This suggests that both income and generational fractionalization impede voting participation. When compared to proxies for norms such as *DSN1* and *DSN2*, the heterogeneity variables are significantly larger in absolute values. In particular, the values for *HETGEN* are distinctly larger. This indicates that fractionalization, especially generational fractionalization, has a greater detrimental effect on voting participation than does the decay of norms. I interpret these results as follows. Japan experienced unprecedented economic growth in the post-war period, which presumably led to differences in preference among generations. The influence of

generational heterogeneity is likely to reflect the differences in experiences among generations. When combined, these results are sufficiently robust to support Hypothesis 1.

With respect to political representation, the coefficients of *RI* produced a positive sign, as predicted, and were statistically significant at the 1% level in all estimations. Contrary to expectations, the signs of *RRI* are negative in columns (3) and (4). Furthermore, the coefficients of *RI* are four times larger by absolute value than *RRI*, implying that *RI* has greater elasticity than *RRI*. The institutional and demographic changes seem to account for the difference between *RI* and *RRI*. Given that it is more appropriate to use *RRI* for the estimation, the *RRI* result represents the true effect of political presentation. The combined results (of *RI* and *RRI*) suggest that the nominal political representation, not the actual representation, enhances voting participation.

AGRI produced the expected result, with positive coefficient signs that are statistically significant and that indirectly reflect the strong influence of the agricultural sector on the outcomes of elections. The absolute values of coefficients are about 0.22, implying that an increase of number of farmers by 1 % leads to increase of voting rates by 0.22 %. As a result, the accepted characteristics of the political system in Japan are statistically supported. *OWHOUS* does not yield the expected positive sign, but is statistically insignificant. This result implies that owing your own home does not create a supportive network among residents and does not play a role in voting participation. Consistent with the prediction, *INCOM* produced negative signs in all estimations, despite being statistically insignificant. Its absolute coefficient values of *INCOM* are slightly less than 0.01²⁷.

²⁷ This is supported by the argument of Kawaura (2003) that wealthy areas may

As expected, *SINGL* possesses a negative sign in all estimations. From this result, I propose that single people have are less likely to vote. The signs of *UNIV* are positive and stable in all estimations. This result is consistent with the results of earlier studies (e.g., Knack, 1992; Greene and Nikolaev, 1999). Its absolute values are approximately 0.03. That is, human capital is positively related to voting participation and the increase in the number of graduates by 1 % results in a 0.03 % increase in voting rates. The signs of *MALE DUMMY* are different between columns (2) and (4), suggesting that there is no difference between sexes after controlling for various factors.

Results of the distribution of votes

The following is a discussion of the estimation results concerning the distribution of votes amongst the parties, as shown in Table 5.

In all estimations concerned with the decline in social norms, both coefficients of *DSN1* and *DSN2* produced the expected positive signs. Furthermore, *DSN1* is statistically significant in all estimations. The magnitudes of *DSN1*, which are between 0.15 and 0.18, are approximately two times larger than those of *DSN2*. It follows from this that population turnover within a community has a more serious detrimental effect upon the voting than does immigrants from outside the community. These results, which are stable and robust to alternative specifications, illustrate that the decline in social norms leads to a reduction in the level of voting. This is consistent with expectations and strongly supports Hypothesis 2.

Focusing now on economic heterogeneities, all signs of *GINI* are negative but are

benefit from budget allocations to a lesser extent, meaning that the benefit of voting for this group is slight.

statistically significant only in column (1). The results related to generational heterogeneity, recorded as *HETGEN*, produce a negative sign in all estimations and are statistically significant at the 1% level in columns (1), (2), and (3). Further, the value of *HETGEN* is extremely large. This implies a concentration of the votes of a heterogeneous community, especially age heterogeneity, to a single party, which is contrary to predictions. As a consequence, the results concerning the effects of social norms are in line with Hypothesis 2, while those of fractionalization are not. In other words, these results are partly consistent with Hypothesis 2.²⁸ Although this result is puzzling and requires further discussion, an explanation for this is that the role of the sense of ‘civic duty’ in the decision to vote or abstain is related to the act of casting a vote *per se*, but does not play a role in the individual party choice decision (Schram 1992).

In terms of political representation, the signs for the coefficients of *RI* and *RR1* are negative, with the absolute values of *RI* being larger than those for *RR1*. Furthermore, *RI* is statistically significant at the 1% level whereas *RR1* is insignificant in all estimations. The results for the distribution of votes are equivalent to those for voting participation. This suggests that voters with a high level of political representation have a tendency to vote for a particular candidate. The nominal political representation (*RI*) is more elastic than the actual representation (*RR1*).

The results for *AGRI (TOTAL)* reveal that its coefficients produced negative signs,

²⁸ As discussed above, the LDP has been the dominant party in Japan for some time and has been sustained by a supportive network that produces large numbers of votes. If this is true, the concentration of votes among the other parties is due in large part to the votes given to LDP. I examined the votes for LDP in the same manner as that described above and found that a decline in social norms is associated with a reduction in the number of votes for LDP, which is consistent with the inference. This result, which is not reported in this paper due to space limitations, is available from the author upon request.

while being statistically significant at the 1 % level. This mirrors the fact that the LDP depends upon the agricultural sector to maintain its position by gaining votes through its interest groups. It follows that the votes are likely to be concentrated on a particular party, namely the LDP; in fact, nearly half of all votes are cast for the LDP²⁹. When I disaggregate *AGRI (TOTAL)* into *AGRI (MALE)* and *AGRI (FEMALE)*, it is surprising to observe that *AGRI (MALE)* takes positive signs while *AGRI (FEMALE)* takes the opposite negative signs in all estimations. These values are distinctly large and statistically significant. This tells me that the behavior of females is out of line with the expectation. Further the values of *AGRI (MALE)* of about -3.30 are larger than those of *AGRI (FEMALE)* of about 2.80 so that the total effects become negative as shown above. I interpret this as reflecting a political gender gap, as noted by Funk and Gathmann (2007)³⁰.

The signs of *OWHOUS* and *INCOME* become positive. It is difficult to ascertain a logical causality for these results and so their interpretation is open to discussion.

SINGL(TOTAL) produced positive signs, indicating that the votes of single people are inclined to be dispersed. That is, single people are less likely to form a homogeneous community amongst themselves and vote for a particular party. The negative signs of *AGRI (MALE)* and the positive ones of *AGRI (FEMALE)* also mirror the political gender gap. This tells me that single males are apt to have similar opinions whereas single females are likely to have different ones. It is generally known that males are more likely to continue in full-time job than females in Japan; therefore, compared with males, there is a wider range of work conditions among

²⁹ Based upon the samples used in the present paper, the LDP gained 45% of all votes.

³⁰ Funk and Gathmann (2007) used the data from Switzerland to provide evidence that woman are more likely to support expenditure for public goods like environment, but oppose defense spending and subsidies for agriculture.

females, leading females to take more various opinions concerning policy issues.

With respect to *UNIV*, significant negative signs appear in all columns and take values between 0.11 and 0.15, implying that individuals graduated from university tend to be concentrated. This allows various interpretations. For instance, I would consider voters with large human capital accumulations from the viewpoint of fractionalization. Voters with a higher education seem to share a similar preference for a candidate, which is relevant in the discussion of fractionalization (Alesina and La Ferrara, 2000). That is, they seem to form a homogeneous community amongst themselves and to vote for a particular party; this conforms to previously suggested results of voting participation.

Various estimated results have been presented above. Taken together, the conclusion reached is that the estimation results are consistent with Hypothesis 1 and in part with Hypothesis 2. The results show that fractionalization has a positive effect on voting participation but a negative influence on the concentration of votes for a particular candidate; this is a puzzling effect.

VI. CONCLUSION

Voting participation is plausibly considered as collective action and appears to be affected by the social condition. Recent studies have shown that it is not only the decline in social norms that impedes collective action, but also social heterogeneity (Vigdor 2004; Yamamura 2008b). In Japan, where society is regarded as having a relatively low degree of heterogeneity, it appears that a candidate can gain votes through a social network shaped by long-term local interaction; however, few researchers have attempted to examine the extent to which these social factors affect

voting behavior in Japan. This paper examines the effect of social norms and fractionalization on voting behavior and presents joint evidence concerning voting participation and the distribution of votes among parties. Even after controlling for factors related to the individual's economic benefit and time-invariant fixed effects, the outcomes for voting behavior were influenced by social norms and fractionalization. The key findings obtained from an analysis based on fixed effects estimation are as follows.

- (1) The voter turnout is higher in a close-knit community; therefore, social capital enhances voting.
- (2) Economic and generational fractionalization results in a lower voter turnout.
- (3) a scarcity of social capital leads to a weak distribution of votes among parties.

In summary of the evidence presented above, this empirical study provides evidence that collective action is enhanced by social norms and low degrees of generational and income fractionalization. The results of this study explain one aspect of human nature related to social existence: the attitudes of others influence voting behavior. These findings, obtained using a fixed effects estimation, can bridge the relationship between voting participation and the distribution of votes among parties.

Both voting participation and the concentration of votes are considered as collective action in the case of an election; however, the results of this study demonstrate that the effects of social norms and fractionalization are not similar. This raises further questions that require additional investigation, especially as to why

fractionalization has an obvious effect upon voting participation but little impact upon the distribution of votes.

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Table 1 Results of existing research to ascertain voter turnout.

Authors	Sample	Methodology	Variables	Aims	Results
Kanioviski and Mueller (2006)	Norwegian school district referendums	OLS Conditional Median	Herfindahl index of linguistic heterogeneity The size of electorate	Examine effects of heterogeneity	Negative
Knack (1992)	Social Sanction Survey (USA) National Election Study (USA)	Logit	Regular Churchgoer New comer Social Sanction	Examine effects of norms and social sanction	Positive

Table 2 Temporal changes in voting rates and distribution of votes among parties.

Year	Representation index	Relative representation index	Turnout rate ^a	Herfindahl index of votes
1990	4.83*10 ⁻⁶	1.158	76.9	0.64
1993	4.72*10 ⁻⁶	1.150	70.7	0.72
1996	2.65*10 ⁻⁶	1.113	62.3	0.68
2000	2.64*10 ⁻⁶	1.119	64.8	0.65
2003	2.61*10 ⁻⁶	1.113	61.6	0.60

Notes: ^a %.

The values are simple averages of yearly values over the period 1988–2001. The data are sourced from *Minryoku*, edited by Asahi Newspaper.

Table 3 Definitions of variables, means, and standard deviations.

Variable	Definition	Mean	Standard deviation
<i>TURN</i>	Turnout rate(Total)	0.67	0.08
<i>TURN (MALE)</i>	Turnout rate(Male)	0.67	0.07
<i>TURN (FEMALE)</i>	Turnout rate (Female)	0.68	0.08
<i>DSN1</i>	Population turnover within prefecture ^a	7.19	8.58
<i>DSN2</i>	Number of immigrants from other prefectures ^a	6.36	7.97
<i>GINI</i>	Gini coefficient of per capita income	0.29	0.01
<i>HETGEN</i>	Herfindahl-type index of age heterogeneity	0.93	0.01
<i>RI</i>	Representation index (Atlas et al., 1995; Meyer and Naka, 1999)	0.46*10 ⁻⁵	0.18*10 ⁻⁵
<i>RRI</i>	Relative representation index (Kawamura, 2003)	1.13	0.20
<i>AGRI</i>	Number of farmers (Total) ^a	3.13	1.46
<i>AGRI (MALE)</i>	Number of farmers (Male) ^a	1.52	0.71
<i>AGRI (FEMALE)</i>	Number of farmers (Female) ^a	1.60	0.74
<i>OWHOUS</i>	rates of home owners.	0.67	0.8
<i>INCOM</i>	Per capita income ^b	2.83	0.41
<i>SINGL</i>	Number of single people (Total) ^a	6.12	6.83
<i>SINGL (MALE)</i>	Number of single people (Male) ^a	3.41	3.87
<i>SINGL (FEMALE)</i>	Number of single people (Female) ^a	2.71	2.97
<i>UNIV</i>	Number of people who graduated from university ^a	2.72	3.88

Notes: ^a In ten thousands.

^b In millions of Yen.

The values are simple averages of yearly values over the period 1988–2001.

Table 4 Regression results for the voting rate (fixed effects estimation).

Variable	(1)	(2)	(3)	(4)
<i>DSN1</i>	-0.04* (-2.08)	-0.04* (-2.08)	-0.03* (-1.66)	-0.03* (-1.66)
<i>DSN2</i>	-0.04* (-2.13)	-0.04* (-2.12)	-0.06** (-2.98)	-0.06** (-2.97)
<i>GINI</i>	-0.11 (-1.63)	-0.11 (-1.63)	-0.12* (-1.82)	-0.12* (-1.82)
<i>HETGEN</i>	-7.65** (-7.40)	-7.65** (-7.39)	-10.0** (-21.3)	-10.0** (-21.3)
<i>RI</i>	0.04** (2.59)	0.04** (2.58)		
<i>RRI</i>			-0.01 (-0.22)	-0.01 (-0.22)
<i>AGRI</i>	0.22** (9.61)	0.22** (9.32)	0.23** (10.4)	0.23** (10.1)
<i>OWHOUS</i>	-0.12 (-0.76)	-0.12 (-0.75)	-0.11 (-0.68)	-0.11 (-0.69)
<i>INCOM</i>	-0.08 (-1.47)	-0.08 (-1.46)	-0.09 (-1.64)	-0.09 (-1.62)
<i>SINGL</i>	-0.01 (-1.63)	-0.01 (-1.33)	-0.01 (-1.43)	-0.01 (-1.24)
<i>UNIV</i>	0.03** (2.39)	0.03** (2.36)	0.04** (3.20)	0.04** (3.18)
<i>MALE DUMMY</i>		-0.01 (-0.03)		0.03 (0.11)
Adjusted R square	0.83	0.83	0.83	0.83
Sample	470	470	470	470
Groups	47	47	47	47
Hasman-test	Yes	Yes	Yes	Yes

Notes: Numbers in parentheses are t-statistics obtained using the delta method. * and ** indicate statistical significance at the 5 and 1% levels, respectively (one-sided tests). 'Yes' suggests that there is systematic difference between the fixed effects and random effects model.

Table 5. Regression results for the distribution of votes (fixed effects estimation).

Variable	(1)	(2)	(3)	(4)
<i>DSN1</i>	0.18** (2.38)	0.16* (2.23)	0.17** (2.33)	0.15* (2.08)
<i>DSN2</i>	0.08 (1.19)	0.05 (0.80)	0.11 (1.62)	0.08 (1.13)
<i>GINI</i>	-0.33 (-1.53)	-0.38* (-1.79)	-0.30 (-1.39)	-0.35 (-1.65)
<i>HETGEN</i>	-10.4** (-3.06)	-9.75** (-2.92)	-3.53** (-2.36)	-2.80* (-1.91)
<i>RI</i>	-0.14** (-2.35)	-0.14** (-2.43)		
<i>RRI</i>			-0.08 (-1.18)	-0.10 (-1.49)
<i>AGRI</i> <i>(TOTAL)</i>	-0.35** (-4.06)		-0.40** (-4.85)	
<i>AGRI</i> <i>(MALE)</i>		-3.29** (-2.92)		-3.34** (-2.93)
<i>AGRI</i> <i>(FEMALE)</i>		2.82** (2.58)		2.81** (2.54)
<i>OWHOUS</i>	1.00* (1.92)	0.91* (1.76)	0.95* (1.81)	0.84 (1.61)
<i>INCOM</i>	0.10 (0.59)	0.09 (0.54)	0.15 (0.86)	0.15 (0.85)
<i>SINGL</i> <i>(TOTAL)</i>	0.23 (0.97)		0.11 (0.49)	
<i>SINGLE</i> <i>(MALE)</i>		-0.57 (-1.19)		-0.73 (-1.51)
<i>SINGLE</i> <i>(FEMALE)</i>		0.64 (1.47)		0.69 (1.54)
<i>UNIV</i>	-0.11** (-2.33)	-0.14** (-2.70)	-0.12** (-2.44)	-0.15** (-2.88)
Adjusted R square	0.31	0.33	0.29	0.32
Sample	235	235	235	235
Groups	47	47	47	47
Hausman-test	Yes	Yes	Yes	Yes

Notes: Numbers in parentheses are t-statistics obtained using the delta method. * and ** indicate statistical significance at the 5 and 1% levels, respectively (one-sided tests). 'Yes' suggests that there is systematic difference between the fixed effects and random effects model.