

Electoral Institutions, Hometowns and Favored Minorities Evidence from Japanese Electoral Reforms¹

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Abstract

This paper presents evidence that electoral institutions affect the geographic distribution of both candidate electoral support and government resources. I exploit two electoral reforms in Japan to identify the effect of institutional incentives: 1) the 1994 electoral reform from a multi-member district (MMD) system to a mixed single-member district/proportional representation (SMD/PR) system; and 2) the 1925 electoral reform from SMD system to a MMD system. Using several new datasets, the two main findings of this paper are: 1) the electoral support of Liberal Democratic Party (LDP) politicians is more concentrated around their hometowns in MMD as compared to SMD systems; and 2) intergovernmental transfers are more concentrated around LDP incumbents' home offices in MMD as compared to SMD systems. In addition to being consistent with the theoretical results in Myerson (1993), the findings in this paper highlight the connection between institutions and geographic patterns of representation.

1. Introduction

Why do legislators choose to represent particular constituencies and why do they support particular policies? The conventional wisdom in the literature is that these decisions are influenced by the incentives associated with particular electoral institutions.¹ However, despite the large literature linking electoral institutions and legislators' behaviors, there are surprisingly few empirical studies demonstrating the influence of electoral institutions on who legislators represent and what policies they support. Some studies of recent electoral reforms find little difference between candidates' electioneering behaviors before and after changes in various electoral systems, raising questions about the impact of electoral institutions on candidate behavior (e.g. Crisp and Ingall (2002); Otake (1998); McKean and Scheiner (2000)).

In this paper, I provide evidence that electoral institutions do affect the relationship between legislators and specific constituencies within electoral districts. The evidence is consistent with the logic developed in formal theoretical models by Myerson (1993) and Cox (1990). These models show that multi-member districts (MMD) provide incentives for legislative candidates to appeal to narrow sub-constituencies by reducing the vote share threshold that candidates need to secure a legislative seat. According to this threshold effect theory, if a candidate appeals to broad cross-sections of a multi-member district's electorate, she will leave herself vulnerable to challengers who can concentrate their efforts on the minimal subset of the constituency necessary to win a seat. Thus, candidates in single-member districts are expected to represent a broader cross-section of their district constituents than candidates in MMDs, which is what the findings in this paper demonstrate.

In addition to providing evidence consistent with the logic of the Myerson (1993) and Cox (1990) models, this paper also illustrates the impact electoral institutions can have on geographic patterns of representation. Although the geographic concentration of legislators'

¹Carey and Shugart (1995); Shugart (2000); Sartori (1976); Taagepera and Shugart (1989); Ames (1995, 2001); Katz (1980); Myerson (1993, 1999); Cox (1990, 1987); Lizzeri and Persico (2001)

electoral support has been observed in various MMD systems in Europe, Latin America and Asia (Ames (1995, 2001); Crisp and Ingall (2002); Curtis (1971); Sacks (1976)), there has been no evidence connecting vote concentration to electoral institutions. The evidence in this paper shows that changes in electoral institutions are associated with changes in the geographic concentration of legislators' electoral support and the allocation of public expenditures.

To identify the effect of institutions on representation, I exploit two unique electoral reforms that occurred in Japan. In 1994, the electoral system changed from a multi-member district single non-transferable vote system (MMD/SNTV) to a mixed electoral system with a single member district single non-transferable vote component and a proportional representation component (SMD/SNTV/PR). In 1925, the electoral system changed from an SMD/SNTV system to a MMD/SNTV system.

In addition to having these two electoral reforms, Japan is an ideal case for testing the threshold effect theory since Japanese legislators are known to have appealed to geographically defined sub-constituencies under the old MMD system. Since these sub-constituencies are observable, I can measure whether Japanese legislators continued to appeal to the same geographically defined sub-constituency after the change in electoral institutions or whether they represented a more geographically diffused constituency. To my knowledge there has been no work examining whether this geographic concentration of Japanese legislators' electoral support is a response to the institutions or is a feature of Japanese political culture independent of the institutional arrangements.

To estimate the relationship between electoral institutions, representation and geography, I utilize several new data sets that I have assembled. In particular I use a new data set identifying the location of candidates' home areas and the geographic concentration of candidates' electoral support and public expenditures around the candidates' home areas within districts. I also use a new data set of pre-World War II election returns aggregated at the sub-district level.

The results of this analysis for the 1994 electoral reforms are consistent with the thresh-

old effect claim that MMD/SNTV systems provide incentives for LDP legislators to target narrow sub-constituencies. More specifically, the results show that both the LDP legislators' vote shares and public expenditures were geographically concentrated around the LDP legislators' home areas under the MMD/SNTV system. As the threshold effect would predict, under the new SMD/SNTV/PR electoral system, both LDP legislators' vote concentration and public expenditures became more geographically diffused relative to the pre-reform period. The relationship between institutions and vote concentration is also found to exist following the 1925 electoral reforms.

The remainder of this paper will be divided into eight sections. The next section briefly reviews the logic underlying the threshold effect argument. Section 2 provides a review of the literature on Japanese legislators' electioneering behaviors under both the pre- and post-1994 electoral systems. The following section presents electoral maps to illustrate how the concentration of legislators' electoral support changed after the 1994 electoral reform. Section 4 presents the data, methods and results which support the prediction that electoral support becomes more diffuse after the 1994 electoral reforms. Section 5 presents some evidence regarding relationship between the geographic concentration of candidate electoral support. Section 6 presents further evidence concerning the influence of institutional change using the pre-World War II electoral reforms. Section 7 presents the data, methods and results which support the prediction that the distribution of targeted subsidies (i.e. pork) would also become more diffused after the electoral reforms. The final section concludes.

2. The Threshold Effect and Favored Minorities

In this section I elaborate on how the electoral incentives facing legislators in multi-member district (MMD) systems differ from the electoral incentives in single member district (SMD) systems. MMD are electoral systems in which more than one seat is elected from each electoral district. Although votes in MMD systems are often cast for party lists, in some MMD systems votes are cast for individual candidates.

The recent theoretical literature argues that MMD electoral systems in which votes are cast for individual candidates provide strong incentives for candidates to appeal to narrow sub-constituencies. Cox (1987, 1990) show that in MMD/SNTV systems with uni-dimensional spatial competition, candidates have an incentive to choose positions dispersed along the policy space away from the median voter. This dispersion increases as the vote share threshold for winning a seat decreases. Myerson (1993) shows that in MMD/SNTV systems where candidates can promise public goods to voters, candidates will have an incentive to promise more goods to narrower sub-constituencies as the threshold for winning a seat decreases.

The logic behind the threshold effect theory is best illustrated by the simplified model presented in Myerson (1999). First the following assumptions are made. There are N seats in the district and voters prefer candidates who can provide them with the largest allocation of goods. Candidates can promise voters to either provide them with a share of the budget or to purchase some public good on their behalf. The budget is large enough to allocate \$1 to each voter, but the public good gives each voter a benefit, $B > \$1$. $Q^* = \frac{1}{N+1}$ is the maximum number of votes a candidate can receive and still not be guaranteed to win.²

Under these assumptions, Myerson (1999) shows that a symmetric equilibrium exists where all candidates promote the public good when $B \geq \frac{1}{Q^*}$. No candidate can offer to the minimum set of voters necessary to guarantee winning a seat, an allocation of the budget that is larger than the benefits these voters would receive from the public good offered by competing candidates. However, when $B < \frac{1}{Q^*}$ and the other candidates promote the public good, then candidates have an optimal strategy to offer $$(B + \epsilon)$ of the budget to $\frac{1}{B+\epsilon}$ of the voters, where ϵ is such that $B + \epsilon < \frac{1}{Q^*}$. Since we know that $B + \epsilon < \frac{1}{Q^*}$, it follows that the candidate will win more than the Q^* necessary to secure a seat. In other words, these$

²Myerson (1999) calculates $Q^* = \frac{1}{K}$ where K is the number of candidates. Since the number of candidates is usually not known for certain in advance, the above example present the case where there is minimal competition. If candidates knew for sure that there would be more candidates then the threshold, Q^* , would be even smaller.

candidates win because they promise voters more through budget allocations than what the voters would receive from the other candidates promoting the public good. This simple example shows that as the district magnitude increases, thereby decreasing the threshold, Q^* , the candidates will appeal to a smaller subset of the electorate by promising them more benefits.

The two predictions from the threshold models most relevant for this paper are: 1) Candidates in MMD/SNTV systems will target resources to appeal to narrow subconstituencies; and 2) The electoral support of candidates in MMD/SNTV systems will be very concentrated in narrow subconstituencies.

Myerson (1993) does not specify how the constituencies that are targeted by particular candidates are defined. Although candidates in MMD systems could potentially divide district constituencies along a number of different dimensions, the geographic concentration of candidate electoral support is a pattern commonly observed in MMD systems. In the next section I discuss how Japanese politicians have traditionally cultivated geographic defined constituencies under the old MMD system. In particular I discuss how hometowns were focal points around which politicians built their electoral support bases and how an older literature claims that this is a product of Japanese political culture.

3. Institutions and Electioneering: The Japan Case

The goal of this section is to describe Japan's old MMD/SNTV and new SMD/SNTV/PR electoral systems and to review the literature on Japanese electioneering behavior under the two systems. The descriptive accounts of Japanese electioneering behavior under the MMD/SNTV system document legislators' efforts to cultivate geographically defined electoral support bases. Some descriptive accounts of electioneering under the new SMD/SNTV system suggest that Japanese legislators have attempted to attract a much broader constituency than under the previous system. These descriptions suggest that legislators are behaving in manner consistent with logic of the threshold effect models.

Electioneering Under the MMD/SNTV System

Japan's MMD/SNTV was originally adopted in Japan in 1900 by the Meiji oligarchs who believed the intra-party electoral competition would prevent any one power from winning enough seats to control the government (Ramseyer and Rosenbluth (1993, 1995); McCubbins and Rosenbluth (1995)). Aside from two brief periods of hiatus, one in 1919 to 1925 and another in 1946, Japan has maintained the MMD/SNTV system until 1994.³ The two defining characteristics of the MMD/SNTV electoral system are: 1) Multiple legislators are elected from each electoral district; and 2) Each voter has a single vote that can be cast for one specific candidate on the ballot in her district. In 1990, the Japanese Lower House elections were divided into 130 MMDs, and between two to six legislators were elected from each district, with a total of 511 Lower House members elected in total.⁴

As the Meiji oligarchs predicted, the MMD/SNTV system presented coordination problems for all parties with ambitions to control the government (Ramseyer and Rosenbluth (1993, 1995)). In order to win a majority, the parties would on average have to win approximately two seats per district. The LDP used its control of the government to provide its candidates with resources to cultivate reputations necessary to differentiate themselves from competing LDP candidates (Cox and Niou (1994)). As a result of the LDP's strategy, Japanese electioneering has become an infamous example of candidate-centered politics. Reed and Thies (2000) write, "Japan has often been cited as holding down the extreme end of candidate-based personalistic politics."⁵ A large body of literature documents the extreme amounts of effort and resources LDP legislators in particular directed towards cultivating personal reputations under the old system (Thayer (1976); Curtis (1971, 1988); Bouissou (1999); Iwai (1990)). Two characteristics of Japanese electioneering under the MMD/SNTV that are particularly relevant for this paper are: 1) LDP candidates used large amounts of resources to differentiate themselves from other LDP candidates; and 2) LDP legislators'

³Section 5 examines the effect of the 1919 to 1925 institutional change.

⁴The one exception is the Anami Islands which is a single member district.

⁵Reed and Thies (2000), p390

resource allocations and electoral supports were very geographically concentrated.

LDP candidates are particularly notorious for investing large amounts of effort in two types of electioneering activities: constituency services and targeting subsidy (pork) allocations. The constituency services, which are organized through the candidates' personal support networks (*koenkai*), provide a wide range of events for the constituents such as local fund raisers, study groups, cultural events (such as sumo matches), tours of the Diet, celebrations, and in some cases trips to hot springs. LDP candidates are also expected to perform personal favors for their constituents, such as providing monetary gifts at weddings and funerals, helping with job or school placement, and mediating disputes between constituents. *Koenkai* usually have large permanent staffs that help provide the Diet members' particularistic constituency services. In the late 1980s, Lower House members were estimated to have spent 120 million yen in off election years and more than double that in election years (Iwai (1990)).

The pork provision is another important resource LDP legislators provide to their constituents. Fukui and Fukai (1996) write, "There is solid consensus among students of Japanese politics about the centrality of pork barrel politics in both parliamentary (Diet) and local elections in Japan."⁶ According to McCubbins and Rosenbluth (1995), a greater proportion of Japanese government expenditures can be earmarked to specific constituencies than in Great Britain or United States. LDP Diet members are viewed as pipelines for local politicians to extract resources from the national government (Fukui and Fukai (1996); Curtis (1982)). Although there is some debate over whether legislators use pork for direct electoral benefits, the popular perception among the Japanese public and media is that LDP politicians are responsible for the pork provided to their districts for which they receive electoral, as well as financial, rewards.⁷ Horiuchi and Saito (2001) present some evidence that

⁶Fukui and Fukai (1996), p268

⁷Woodall (1996) argues that pork provision is mainly to receive the contributions from special interests necessary to support *koenkai* activities for constituents. However, this argument does not preclude the simultaneous use of this same pork to benefit LDP legislators' own constituencies as well as the special interests.

inter-governmental transfers do appear to be influenced by political factors.⁸

Tanaka Kakuei is often cited as the extreme example of a candidate using constituency services and pork provision to cater to his electorate. One of Tanaka's final activities while in office was to take 11,000 people to Nukumi hot springs in Yamagata prefecture at a cost of \$1.4 million.⁹ He is also known for bringing Japan's high speed rail line to his home prefecture, a project that took 11 years to build at a cost of millions of dollars per kilometer. Four of the eight bullet train stops are in Tanaka's home prefecture and two of the stops are less than 14 miles apart.¹⁰

The second characteristic of Japanese electioneering relevant for this paper is the division of district constituencies into sub-constituencies in order to solve the coordination problem for both legislators and voters. In the absence of some way to divide constituencies, LDP members could potentially find themselves using resources to compete for the same sub-constituency when they could receive higher electoral returns from their resources by targeting separate sub-constituencies. Voters with partisan preferences need a secondary cue to allocate their vote to a specific candidate from their preferred party. In the absence of secondary cues to divide partisan votes, voters would have difficulty casting their votes to maximize the number of seats their preferred party could win.

Japanese legislators have traditionally used their hometowns, known as *jimoto*, as a way to divide the electorate into geographically defined sub-constituencies, known as *jiban*. Curtis (1971) writes, "[a]n LDP Diet member often has support in his district concentrated in a limited geographical area of which his home town is the center...Even within counties there is a tendency for the vote to decrease the further the town from the candidate's native town or village."¹¹ Candidates would cultivate electoral support in their *jiban* by

⁸Horiuchi and Saito (2001) show that with the reapportionment that accompanied the electoral reforms came a redistribution of public finance. Areas where votes were disproportionately weighted received more subsidies from the central government.

⁹Richardson (1997), p28

¹⁰Schlesinger (1997), p104

¹¹Curtis (1971), p87

concentrating their resources in the areas around the candidates' hometowns. Thayer (1976) writes, "[t]he traditional method by which a conservative politician puts together enough votes to win a Diet seat is to work intensively on his birthplace and a few other specially selected areas."¹² Candidates' *koenkai* were often located in the candidates' hometowns and the *koenkai* activities were directed towards candidates' *jiban* constituencies.¹³

The importance of *jiban* in Japan is also often argued to be a reflection of Japan's "parochial political culture". Unlike the U.S. "friends and neighbors" effect, where local interests are secondary to national partisan divisions, in Japan, national partisan divisions are often believed to be secondary to local interests.¹⁴ Flanagan (1968) writes, "In Japan *jimoto* [hometown] consciousness is a general election phenomenon which transcends rather than substitutes for party labels."¹⁵ Up to 40 percent of the Japanese electorate saw local interest representation as the basis for their vote and just as many, if not more, voters turned out for local versus national elections outside the major metropolitan areas.¹⁶ Local

¹²Thayer (1976), p98

¹³In describing *koenkai* locations, a reporter from the *Mainichi Shimbun* stated "Most of them center on the Dietman's birthplace and few other pockets in the district." (as cited in Thayer (1976) p103).

¹⁴In describing Alabama politics in the 1930s and 40s, Key writes:

Almost any local leader with any prospects at all who aspires for state office can cut into the strength of established state leaders or factions within his own immediate bailiwick. He gains support, not primarily for what he stands for or because of his capacities, but because of where he lives. A more or less totally irrelevant appeal - back the hometown boy - can exert no little influence over an electorate not habituated to the types of voting behavior characteristic of a two-party situation.

In Key's "friends and neighbors" analysis, hometowns matter to voters only to the extent that there are no strong partisan or factional divisions.

¹⁵Flanagan (1968) p402. Parentheses added by author. Flanagan and Richardson (1977) write, "What we find among many Japanese voters is a parochial and particularistic political outlook - a local rather than a national consciousness, an emphasis on special benefits for one's local area (*jimoto rieki*) and a preference for identifying with proximate candidates and personalities rather than more distant and intangible political objects such as national party labels, ideological issues and national leaders." (p52)

¹⁶Richardson (1997) p32, Horiuchi (1999) describes this "turnout twist" in detail.

politicians and social elites, who are often argued to strongly influence voting behavior, tend to have stronger connections with hometown candidates because their candidates are believed to have greater understanding and sympathy for the local political concerns.¹⁷

McCubbins and Rosenbluth (1995) present an alternative hypothesis for how the coordination problem is solved. They argue that candidates signal policy expertise through their committee assignments to claim credit for particular policies. Their evidence is that the committee assignments differ significantly from what would be expected if committee assignment were made at random. Inoguchi and Iwai (1987) present evidence that candidates with policy expertise, *zokugijin*, have been on the rise since the 1970s. However, they argue and present evidence that LDP legislators' interest in policy affairs is not to produce electoral security, but rather is a result of electoral security. Legislators who are electorally secure will be more willing to spend time on policy issues.¹⁸ While the importance of policy differentiation as an additional means to solve the coordination problems is intriguing and deserves further research, this paper focuses on geographic differentiation of candidates, which is a well documented feature of electioneering under the old electoral system.

Electoral Reform in the 1990s

By the early 1990s there was a widespread belief among academics, journalists, politicians and the general public that the pathologies of candidate-centered electoral competition, such as corruption, money politics and special interest influence, were related to Japan's MMD electoral system. In 1993 several groups of Diet members defected from the LDP in protest of the LDP's inability to pass political reform legislation. The leader of the largest group of LDP defectors, Ozawa Ichiro, wrote, "[T]he multi-seat electoral district system...is also

¹⁷Flanagan (1991); Richardson (1967, 1997); Steiner (1965); Cox, Rosenbluth and Thies (1998)

¹⁸According to Curtis (1982), LDP incumbents who lose an election are more likely to win the next election because they can spend more time campaigning in the district and do not have to be engaged in activities in Tokyo. Tatebayashi and McKean (2001) present a theory and evidence for why LDP candidates may differentiate themselves along policy dimensions only when they cannot differentiate themselves along geographic lines.

at the root of our ‘money-politics’ problem...reform that does not transform the electoral system itself will not have the backbone needed to change the nature of politics.”¹⁹ The reformers stated that they hoped to reform the electoral system so that competition would be based on party platforms and specific issues.

The LDP defectors, in coalition with former opposition parties, formulated legislation to change the electoral system. In 1994, Japan’s Lower House MMD/SNTV system was changed to a SMD/SNTV/PR system. Under the new system, only one Diet member is elected from each SMD. The PR Diet members are also elected off the party lists in proportion to the number of PR votes the parties receive. Voters were given two votes, one to cast for an SMD candidate and one to cast for a party in the PR system. The 130 Lower House MMDs are divided into 300 SMDs, with 43 of the SMDs containing areas from at least two former MMDs. The 200 PR seats are divided between eleven geographic blocs and voters are given a single non-transferable PR vote.²⁰ SMD candidates could also have a place on the PR lists.

Carey and Shugart (1995) and Shugart (2000) provide some theoretical justifications for the Japanese reformers’ claims that changing the electoral system would reduce candidate-centered politics. Carey and Shugart (1995) and Shugart (2000) rank order the electoral systems based on the incentives to cultivate personal reputations. According to their rank ordering, Japan’s MMD/SNTV has the strongest incentives for candidates to cultivate personalistic ties. Carey and Shugart (1995) write, “of all the systems in which parties control nominations, this is clearly the most personalistic.”²¹ According to the Carey and Shugart (1995) and Shugart (2000) rankings, the incentives to cultivate personal reputations are weaker in SMD/SNTV/PR systems, as compared to MMD/SNTV systems. Thus, it was not unreasonable that the Japanese public would believe that the new system could reduce candidate-centered electoral politics.

The descriptive accounts of candidate electioneering suggest that the electoral reforms have had little immediate impact on candidate-centered politics (Otake (1998); McKean and

¹⁹Ozawa (1994), p68

²⁰This was later reduced to 180 in the 2000 Lower House election

²¹Carey and Shugart (1995), (p429)

Scheiner (2000); Christensen (1998)). Candidates in SMDs are still making personalistic rather than policy oriented appeals to voters and local organizations. Conservative candidates, in particular, are still relying on their *koenkai* to build personal support in their districts. However, the descriptive accounts do suggest that candidates are trying to cultivate ties with organizations they had not been connected to in the past (Christensen (1998)).²² Also, LDP incumbents who were redistricted are known to have exchanged lists of their *koenkai* members with the LDP candidate running in their former *jiban*. This movement away from cultivating narrow subconstituencies to cultivating broader cross sections of voters is consistent with the predictions of the threshold effect models.

4. Visual Evidence of Threshold Effects

Electoral maps visually illustrate the changes in legislators' electoral support after the electoral reforms that are predicted by the threshold effect models. The electoral map of Akita 2nd District in the 1983 Lower House (LH) Election illustrates the relationship between candidates' hometowns and *jiban* when the candidates' hometowns are geographically separated. This district consists of thirty-five rural towns/villages and four small cities. Three LDP candidates, two JSP candidates, and one JCP candidate competed in this election. As Figure 1 illustrates, the three LDP candidates, Muraoka Kanezo, Sasayama Tatsuo, and Nemoto Ryutaro, divide the district into thirds, with the Muraoka *jiban* in the southeastern section, the Sasayama *jiban* in the southwestern section, and the Nemoto *jiban* in the northern section. Similarly, the two JSP candidates, Kawamata Kenjiro and Hosoya Akio, divide the district roughly in half with the Kenjiro *jiban* in the southwestern section and the Hosoya *jiban* in the northeastern section. The circles indicate the location of the candidates' hometowns. Both the LDP and JSP candidates' hometowns coincide with the

²²Christensen (1998) describes how in the 1996 election, former Socialist members would cultivate constituencies, such as construction firms and veterans organizations, that traditionally voted for conservative candidates.

approximate location or at least direction of the areas where the candidates have relatively high vote shares. The JSP candidates' jiban and LDP candidates' jiban show a significant amount of overlap, as would be expected if the hometown effect acted mainly as a voting cue between candidates from the same party.²³

The diffusion of candidates' vote shares can be seen in Figure 2, the electoral maps for the LDP incumbent, Muraoka Kanezo, in the first two elections under the new electoral system. Although Muraoka's vote concentration appears to remain slightly higher around his hometown in 1996, by the 2000 election his electoral support has spread relatively evenly throughout the district.

Miyagi 6th District is an example of a district in which the incumbents' electoral support became more diffused after the electoral reforms. In this district there are two effective candidates, a six term LDP incumbent, Kikuchi Fukujiro, and a three-term New Frontier Party (NFP) incumbent, Oishi Masamitsu. Prior to becoming an NFP member, Oishi was affiliated with the LDP. As Figure 3 illustrates, in the 1996 LH election, although the candidates still appear to be dividing the district as they did in the 1993 LH election, the candidates' vote shares are no longer as concentrated around their hometowns as they were in the elections under the MMD/SNTV system.

Indicators of the geographic concentration of candidates' vote shares, such as Mizusaki's RS index, also illustrate the sharp decrease in geographic concentration of LDP incumbents' vote shares between the old and new electoral systems (see Figure 4 for the results and

²³The jiban were relatively stable over time despite changes in electoral competition. Electoral maps the candidates' vote shares for the 1986 Lower House election in the same Akita 2nd District after one of the LDP candidates retired and a new conservative replaced him. The new conservative candidate, Minorikawa Hidefumi, has the same hometown and jiban as the retired LDP candidate Nemoto Ryutaro. Although Minorikawa ran as an independent, he received factional support from the LDP faction leader Abe Shintaro, so it was clear that he was essentially an LDP candidate. The three conservative candidates and two JSP candidates all have the same configuration of hometowns and jiban in the 1986 LH election as in the 1983 LH election. Electoral maps of the 1980 and 1990 LH elections reveal continued stability in candidates' jiban patterns.

definition of the Mizusaki RS index). LDP incumbents are now picking up much higher vote shares in areas of the district where they had won relatively few votes in the past. Thus, if the hometown is simply a cue to divide the votes and/or candidates are successfully altering their electioneering away from their hometowns, then we should expect little if any evidence for the hometown effect under the new system.

5. Estimating the Threshold Effect on Vote Concentration

This section presents empirical evidence that the threshold effect influenced the concentration of legislators' electoral support. The results in this section provide further evidence that electoral support is concentrated around the LDP candidates' hometowns under the MMD/SNTV system. The results also suggest that the same LDP legislators' vote shares are less concentrated in the elections after the electoral reforms. These results are consistent with the predictions of the threshold effects models. This section will be divided into three subsections. The first subsection will present the data and measurement issues. The second subsection examines how the electoral support of LDP candidates evolved across the four elections between 1990 and 2000. The third subsection examines how the patterns of electoral support for the LDP candidates compared to candidates from other parties.

Data and Measurement

The analysis in this section uses data aggregated at the municipality-level. In Japan, the 47 prefectures are divided into over 3,300 municipalities (i.e. city, ward, town, and village). In 1995 the municipalities ranged in population from under 200 to over one million people. Thus, the electoral districts vary in the number of municipalities they contain. The municipality level electoral data for the Lower House elections comes from the *Japan Election Data-Base* by Mizusaki Version 2.0 *JED-M* version 2.0. This dataset contains candidate vote totals for elections under the MMD/SNTV system and both candidate and PR vote totals for elections under the SMD/SNTV/PR system.

Additional electoral data on the proportional representation (PR) vote in the 1995 Upper House election is also used in the measure of the normal vote. The normal vote is a measure of partisanship in a particular region.²⁴ It is the vote share a candidate can reasonably expect to receive just from her partisan affiliation. The upper house PR data comes from the Asahi Newspaper *asahi.com de miru '98 saninsen no subete*. The PR vote from the 1995 Upper House election is included because the PR votes from the 1996 and 2000 elections are likely to be correlated with the SMD vote for the same elections. There are potential issues of split ticket voting and differences in choice sets between the PR and SMD districts which could reduce the accuracy of the PR vote as a measure of the normal vote.²⁵

The electoral data are supplemented with data on candidates' hometowns. Since a hometown is an abstract concept, it can be proxied using several different measures, such as a candidate's current residence, birthplace, family members' residences, or home-office location. For the first analysis in this section, I use the municipality of the candidate's residence as a proxy for the hometown. This data is taken from the CD-ROM *asahi.com de miru '96 sosenkyo no subete*, compiled by Asahi Newspaper. For the second analysis I use the municipality of the incumbent legislators' home offices as the proxy for the hometown. This data was gathered from various issues of the *Seiji Handobuku*.

Finally, a measure of the distance from candidates' home municipality needs to be calculated. Again there are a number of ways to measure the distance between municipalities. For the purposes of this analysis I use the simplest measure, which is the distance in kilometers

²⁴The PR Vote could be dropped and the substantive findings would remain the same.

²⁵The choice set issue would not be a problem if all the voters who vote for parties not represented in the SMD election vote for a non-LDP party. To determine whether the choice set difference had a large effect on the coefficients on the distance variables, the 16 districts that where the SMD choice set consisted of an LDP candidate, an NFP candidate and a JCP candidate are examined for 1996. The PR vote for the non LDP parties who are on the PR ballot but not in the SMD are included. If voters are voting sincerely then the LDP should simple receive a certain fraction of the PR vote for the non-LDP parties not represented in the SMD. Including these PR covariates do not significantly change the magnitudes of the coefficients of interest.

between the centroids of each municipality. The centroids are mean distance latitude and longitude within the district. The distance data is calculated using ERSI GIS shape and boundary files.

LDP Candidates Before and After 1994 Reform

To estimate the change in vote patterns, I examine how LDP incumbents' vote shares changed with distance from the incumbents' hometowns for incumbents who ran in the 1990, 1993, 1996 and 2000 elections. I examine the candidates' vote shares only in the municipalities that are consistently part of the incumbents' electoral district across the four elections.²⁶ Only incumbents whose post-reform electoral districts contain more than four municipalities and whose SMD boundaries contain only one old MMD district are included in this analysis. 59 LDP candidates and 1057 municipalities (5-40 municipalities/district) are included in this analysis. The major metropolitan areas are excluded.

Limiting the analysis to 59 LDP incumbents presents potential sample selection issues. In particular, the sample of legislators is biased towards rural areas, since most districts in major metropolitan areas consist of less than five municipalities. The hometown effect, or *jiban*, is often argued to be strongest in rural regions, so we might estimate an unrepresentatively large hometown effect under the MMD/SNTV system. However, if this bias exists, the bias should be present in the new system as well, in which case the *jiban* should be evident even after the electoral system has changed. The sample size can be increased to 106 candidates by examining only the 1993 and 1996 elections. The substantive results presented below hold for the larger sample as well.

A simple linear specification is used to estimate the hometown effect for LDP candidates in municipality j of district i (see Appendix A for binomial specification).

$$VoteShare_{ij} = \alpha_i + \alpha_1 Jimoto_{ij} + \alpha_2 Distance_{ij} + \alpha_3 Distance_{ij}^2 + \alpha_4 Partisanship_{ij} + \epsilon_{ij}$$

²⁶In all cases the comparisons are made across the boundaries of the SMDs since the SMDs boundaries most cases are a subset of an MMD. SMDs containing segments of more than one MMD are excluded from the sample.

α_i is a fixed effect for each district, which is included to account for candidate/district characteristics that do not vary across municipalities, such as the quality of the LDP incumbent relative to candidates from all the other parties. The $Jimoto_{ij}$ variable is an indicator variable for whether or not the municipality is considered the incumbent's hometown. We might expect the candidates to have an even larger advantage in their hometown municipality, $\alpha_1 > 0$. $Distance_{ij}$ is a measure of the distance between municipality j and the LDP incumbent in district i 's hometown municipality. The $Distance_{ij}^2$ term is included in the analysis to account for a potential non-linearity in the relationship between vote shares and distance from the hometown. $Partisanship$ is the average PR vote for the LDP in municipality j from the Upper House and Lower House elections. We would expect partisanship to have an effect both in the pre- and post-reform periods but it should explain more of the variance in the post reform period.

A simple ordinary least squares model is run for each year separately. The main variable of interest is the *Distance* variable.²⁷ If candidates' vote concentration is due to factors other than those determined by the electoral system, then we would expect the effect of *Distance* to be the same in both the old and new systems. However, if candidates' vote concentrations are due to factors related to the electoral system, in particular the threshold effect, then we would expect *Distance* to have a larger negative effect in the old system as compared to the new system.

The results of the 1990, 1993, 1996, and 2000 regressions are presented in Table 1. The regression results for the two elections under the old electoral system, the 1990 and the 1993 elections, are consistent with the descriptive accounts that LDP candidates concentrated their efforts and resources on geographically defined areas within their districts. The coefficient on the distance variable is negative and statistically significant in both the 1990 and

²⁷A least squares model with weights for the number of the voters in each municipality produces substantively similar results.

the 1993 regressions.²⁸ The difference between the coefficient on the *Distance* variable in the 1990 and 1993 regressions is statistically insignificant. The positive coefficient on the *Distance*² variable indicates that candidates' vote shares drop more rapidly close to the incumbents' hometowns.²⁹

The regression results for the two elections under the new electoral system, the 1996 and 2000 elections, are consistent with the predictions from the electoral system threshold effect. Although the coefficient on the *Distance* variable is still significant in the 1996 election, the point estimate of the magnitude of the coefficient drops to 15% of the size of the coefficient in 1993 election. The difference in the coefficients on the *Distance* variable between the two electoral systems is statistically significant. By the 2000 election, the coefficient on the *Distance* variable is even smaller in absolute magnitude than in the 1996 election and statistically insignificant.

The coefficient on the hometown indicator variable is statistically significant at the 5% level in the 1990 election. Incumbent LDP members' vote shares are 3.5 percentage points higher in their hometowns than could be explained by *Distance* alone. Why this additional boost in vote shares appears in only the 1990 election is unclear. The 3.5 percentage point rise could partly be explained by the larger magnitude of the negative coefficient on the *Distance* variable in the 1993 regression as opposed to the 1990 election.

The coefficient on the *Partisanship* variable is statistically significant under the old and new systems as expected. LDP legislators' personal electoral successes are closely tied to voters' partisan preferences. This is contrary to the view in the literature that the electoral support for LDP candidates comes primarily from their personal votes largely independent of partisan effects (e.g. Flanagan and Richardson (1977); Bawn, Cox and Rosenbluth (1999)).

Vote Concentration of LDP, JSP and CGP Incumbents

To compare the change in vote patterns across parties, I examine the relationship between

²⁸Statistical significance is taken to be the standard 5% level.

²⁹Distance starts to have a positive effect for municipalities farther than 140 km away from the hometown. These municipalities are for the most part small islands far from the mainland.

vote shares and distance from an incumbent’s home office for all LDP, Japan Socialist Party (JSP) and Clean Government Party (CGP) incumbents. As above, only the municipalities within the boundaries of a single member district that contains more than four municipalities are included in the analysis.

For ease of comparability across parties, I use a very simple linear specification to estimate the home office effect for incumbent k in municipality j of district i .³⁰

$$VoteShare_{ijk} = \alpha_{ik} + \alpha_1 Distance_{ijk} + \epsilon_{ijk}$$

Again, α_{ik} is a fixed effect for incumbent k in district i , which is included to account for candidate/district characteristics that do not vary across municipalities. $Distance_{ijk}$ is a measure of the distance between municipality j and the incumbent k ’s home office municipality.

The regression results for the 1983, 1986, 1990, and 1993 elections are presented in Table 2. The magnitude of α_1 for LDP incumbents is more than twice as large as for the JSP and CGP party incumbents. This illustrates that the high vote concentration under the MMD system is not a general phenomenon that affects incumbents for all parties. The relatively high concentration of LDP incumbents vote shares is consistent with the descriptive accounts that LDP incumbents use their resources to cultivate favored minorities.

Table 2 also provides further evidence in support of the threshold effect argument. The results show that even if we extend the sample to all LDP incumbents, the absolute value of the coefficient on the distance variable drops substantially following the 1994 electoral reforms. As the formal models predict, the LDP incumbents’ personal support in the MMD system is more geographically concentrated than in the SMD system.

6. Pre-World War II Electoral Reform

To test whether the diffusion of candidate electoral support is specific to the context sur-

³⁰A least squares model with weights for the number of the voters in each municipality produces substantively similar results.

rounding the 1994 electoral reform, I examine whether a similar change in the concentration of candidates' electoral support occurred around the 1925 electoral reforms. If the threshold effect argument holds then we would expect candidates' electoral support to become more concentrated in the areas that move from SMD to MMD representation. Thus, the change in vote concentration following the 1925 reforms should be in the opposite direction of the change in vote concentration following the 1994 reforms. The 1925 reform case will help rule out the possibility that the 1994 reforms coincided with various technological and cultural changes that would have made candidates vote concentration become more diffused independent of the changes in the electoral institutions.

The 1925 Elections Act changed the Japanese electoral system from a system with 295 single-member districts, 63 two-member districts, and 11 three-member districts to one with 53 three-member districts, 38 four-member districts, and 31 five-member districts. According to Ramseyer and Rosenbluth (1995), three political parties, the Seiyukai, Kenseikai and Kakushin Club, viewed a MMD system as being more beneficial to them than the SMD system, since the MMD system would insure that they would be represented in the government and it would prevented some other party from gaining a majority of seats. Thus, these three parties formed a majority coalition to pass the 1925 Election Act in the House of Representatives.³¹

The descriptive accounts of post-1925 Japanese politics suggest that candidates under the new MMD system used their resources to cultivate favored minorities in a similar manner as the LDP candidates under the post World War II MMD system. Ramseyer and Rosenbluth (1995) write, "...the pre-war centrist parties such as the Seiyukai adopted strategies like the one the post-war Liberal Democratic Party (LDP) adopted: They divided their supporters by using private goods (generally pork or bribes) to induce them to join personalized support

³¹The change in the electoral institutions coincided with an extension of suffrage. In 1925, the tax qualification was abolished and the number of eligible voters quadrupled (Yanaga (1956)). The introduction of so many new voters should bias the results against finding an increase in the concentration of candidates' electoral support.

groups for individual candidates.”³² The description of candidates’ electioneering behavior is consistent with the predictions made by the threshold effect argument.

To test whether the 1925 institutional change had an effect on electoral concentration, I use a new data set of sub-district (*gun*) level electoral returns from the 1920 and 1928 Lower House elections. The 1920 election was held under the SMD system, while the 1928 election was held under the MMD system. The electoral data comes from the *Dai Jyuu Go Kai Shugiingiin Sousenkyo Ichiran* and the *Dai Jyuu Roku Kai Shugiingiin Sousenkyo Ichiran*.

Since the data is not disaggregated at a very low level and information about candidates’ hometowns is not available, I cannot use the same specification as in Section 5. Instead I use the measure of vote concentration discussed in section 4, the Mizusaki RS index, to illustrate the change in geographic concentration of candidates’ vote shares between the old and new electoral systems. Only those candidates who ran in both the old and new systems are included in the analysis.

On average, candidates’ vote shares tended to be more concentrated in the 1928 election as compared to the 1920 election. The difference in concentration is illustrated in Figure 5 which plots the vote concentration index, RS index, for candidates who ran in both the 1928 and 1920 elections. Individual candidates’ vote concentration indices tend to be larger in 1928, indicating higher vote concentration, for the 1928 election as compared to the 1920 election. This means that that SMD candidates’ electoral support tended to become more concentrated after the introduction of the MMD system. Again, this pattern is consistent with the threshold effect argument described in Section 2.

7. Estimating the Threshold Effect on Government Transfers

In this section I test whether the electoral reforms had the same effect on the distribution of central government transfers to municipalities as it did on the diffusion of candidates’ vote shares. There is empirical evidence that some political parties outside Japan do appear to

³²Ramseyer and Rosenbluth (1995), p52

distribute transfers from the national government to particular geographic localities at least partly for political reasons.³³ Ames (2001) and Crisp and Ingall (2002) find evidence that incumbents in MMD direct pork projects to their geographic subconstituencies within their districts. This section is divided into three subsections. The first subsection describes the data and measurement issues. The second subsection describes the model specification. The final subsection presents the results.

Data and Measurement

Just as in the section on diffusion of electoral support, this analysis uses data aggregated at the municipality level. The dependent variable, targeted subsidies (pork), is measured by per capita central-to-municipality government transfers, *kokko shishutsukin*. This data comes from the *Chiho Zaisei Kenkyukai*. The central-to-municipality government transfers include subsidies for general construction, compulsory education, disaster relief, livelihood protection, elderly care and child-care. Some of these transfers are a function of socio-demographic variables (e.g. compulsory education and elderly care), while other transfers are allocated according to more subjective standards (e.g. construction). This data is available from 1980 to 2002.³⁴

As in Section 4, the main variable of interest is the distance from each incumbent's hometown. Unlike the analysis of electoral diffusion where distance is measured relative to one legislators' hometown, the central-to-municipality government transfer levels are relative to the municipalities' distance from all LDP incumbents' home offices. Thus, the relevant distance of interest is the minimum distance to any LDP member's home office. To calculate these distances a dataset of all incumbents' home offices from 1983 until 2000 was created using the information in various issues of the *Seiji Handobuku*. Ideally the incumbents' home addresses would have made this analysis mirror the above analysis more closely, but the information on incumbents' home addresses is not readily available.

³³Wallis (1998); Levitt and Snyder (1995); Case (2001); Hird (2001); Ames (1995); Stein and Bickers (1994); Bickers and Stein (1996)

³⁴The subsidy and income data are adjusted to their real value in 2000.

Several additional independent variables are also included in this analysis, the first of which is the percentage of the workforce engaged in first tier industries (i.e. agriculture and fisheries).³⁵ Another independent variable is the percentage of the population that is considered dependent (i.e. over 65 or under 15). Since part of the welfare portion of the transfers is formulaic and to benefit children and the elderly, we would expect that the transfers to these areas would be higher simply because of demographic shifts. A third control variable is income. Since part of the transfers are used for the welfare of the economically poorer class, we would expect a rise in income to lead a drop in transfer distribution. This data comes from the *Minryoku 2000* CD-ROM.³⁶

Model Specification

To estimate the effect of hometowns on subsidy distribution, I examine how the subsidy levels of municipalities whose distance to the closest LDP incumbent changes after an election. As above, only municipalities which are part of electoral districts that contain more than four municipalities and are less than 150 kilometers from an LDP home office are included in the sample.³⁷ Election years are excluded from the sample to avoid measurement issues regarding when the legislators' involvement in subsidy allocation begins and the retiring legislators' involvement ends.³⁸

The degree to which the distribution of subsidies is affected by the electoral reform is estimated using a simple fixed effects model with both municipality and year fixed effects.

³⁵First tier industries have long been known to receive a disproportionate amount of pork (e.g. Thies (1998))

³⁶One of the measurement issues is that, unlike the central-to-municipality transfer data, population and a number of the control variables are not reported yearly. The data for population and agriculture workforce is only available for 1985, 1990, 1995 and 2000. The data for the Dependent Population variable is available for 1985, 1990 and 1994 to 1999. The missing data is assumed to have changed linearly between the observed data points. The data for income is available yearly but only for the period 1988 to 1999.

³⁷Municipalities greater than 150 kilometers from an LDP candidate's home office tend to be small islands far from the mainland.

³⁸Legislators can still adjust subsidies even after the fiscal budgets have been passed by through the supplemental budgets.

The municipality fixed effects are included to account for omitted variables that do not vary over time but may affect the distribution of subsidies.³⁹ The year fixed effects take into account inter-temporal fluctuations in the overall level of subsidies.

The following simple linear specification is used to estimate the hometown effect on subsidies for LDP candidates in municipality i in time t :

$$S_{it} = \gamma_i + \gamma_t + \alpha_1 D_{it} + \alpha_2 D_{it} O_t + \alpha_3 D_{it} R_i + \alpha_4 I_{it} + \alpha_5 A_{it} + \alpha_6 DP_{it} + \alpha_8 L_{it} + \epsilon_{it}$$

where S is the per capita government transfers to municipality i , D is the minimum distance from municipality i to an LDP candidates home office, I is per capita income, A is a measure of agricultural intensity, DP is the proportion of the population above sixty-five or below fifteen years of age, and L is the total LDP electoral support in municipality i . R is an indicator variable equal to one for the years after the 1994 electoral reforms and zero otherwise. O is an indicator variable for 1994, which is the one year in the sample that the LDP was not in control of the government.

If LDP legislators are directing government resources to their home areas under the MMD/SNTV system, then we would expect α_1 , the coefficient on D_{it} , to be negative. $\alpha_1 < 0$ indicates that municipalities farther from the candidates' home offices would be receiving fewer subsidies. If subsidies become less concentrated after the move to the SMD/SNTV/PR system, then we would expect α_2 , the coefficient on $D_{it} R_t$, to be positive. The municipalities farther from LDP home offices, which received fewer subsidies in the MMD/SNTV system, should be receiving more subsidies under the SMD/SNTV/PR system relative to the old system.

LDP electoral support, L , is included in the regression to test whether subsidy distribution is primarily given to areas which are LDP strongholds, as was found to be the case in the US (Levitt and Snyder (1995), Ansolabehere and Snyder (2003)). If the party, not the

³⁹For example, Horiuchi and Saito (2001) argue that the size of the municipality should matter because larger municipalities require more construction projects.

LDP incumbents, is distributing subsidy allocations, then we would expect LDP electoral support to strongly influence government transfers.⁴⁰

Two sets of regressions are run. The first treats each year observation separately. The second uses the average of the variables between elections. This second regression averages the variables within seven periods, 1984-85, 1987-89, 1991-92, 1994, 1995, 1997-1999, and 2001-2002.

Results and Interpretation

Most of the regression results, which are presented in Table 3, are consistent with the threshold effect model where candidates in MMD systems concentrate their resources on geographically defined sub-constituencies. Columns (2), (4), (6) and (8) present the results with all of the variables in logs. Columns (1), (2), (5), and (6) present the results for the period 1984 to 2002, while the columns (3), (4), (7) and (8) present the results for the period 1988 to 2002.⁴¹ The top half of the table presents results when each year is treated as a separate observation. The bottom half of the table presents the results averaging the variables for the years between elections.

The negative and statistically significant coefficient on the *Minimum Distance* variable in specifications (1)-(3) and (5)-(7) suggests that under the MMD/SNTV system subsidies were lower for municipalities farther from an LDP incumbent's hometown. This is consistent with what we would expect if LDP candidates were using pork provision to help solve the voters' coordination problems.

Similarly the positive and statistically significant coefficient on variable interacting *Minimum Distance* and *Post Reform* in specifications (1)-(3) and (5)-(7) suggests that after the electoral reforms, the municipalities far from LDP incumbents' home offices received more

⁴⁰Ideally the average LDP vote share across all offices should be used to measure of LDP support in a given municipality. Using multiple offices would reduce the influence of candidate specific or office specific effects.

⁴¹Since many of the control variables are not readily available for the period prior to 1988, including these variables in the model reduces the sample size.

subsidies after the electoral reforms. This is consistent with the threshold effect predictions that under the SMD/SNTV/PR system LDP legislators no longer need to cultivate geographic sub-constituencies.

In the regressions using the log of the variables and include all the control variables, columns (4) and (8), the coefficients on the *Minimum Distance* and the *Minimum Distance/Post Reform* interaction variables have the correct signs. However, the statistical insignificance of these coefficients suggests that the results are somewhat sensitive to specification.

The positive and statistically significant coefficient on the variable interacting *Minimum Distance* and *Out of Power* suggests that when the opposition gained control over the government it shifted subsidies away from the traditional support bases of LDP incumbents and distributed government transfers more broadly.

The coefficients on the various demographic and economic variables also have the predicted sign. The coefficient on *Income* is also statistically significant in all of the specifications. The coefficient on the *Dependent Population* variable is also positive and statistically significant in the regressions with the variables not averaged across years.

The coefficient on the *LDP Vote Share* variable is positive and statistically significant in three out of the four specifications ((4), (7), and (8)). This result is consistent with the finding that the parties tend to distribute resources to their electoral support bases.

8. Conclusion

The above analysis provides evidence that electoral institutions have a significant impact on representation. The evidence is consistent with the logic described in the formal models developed by Myerson (1993) and Cox (1990) concerning how candidate and voter behavior should respond to the incentives of different electoral institutions. As the models predict, both the distribution of candidates' electoral support and the distribution of government resource are found to be more concentrated in MMD systems than SMD systems.

These results also call into question the claims by a number of Japan observers that the 1994 reforms had little impact on legislators' electioneering activities. The results show that LDP legislators' electoral support and the policies used to cultivate this support changed when the electoral system moved from a MMD/SNTV to a SMD/SNTV/PR system in 1994. Both the electoral support and the distribution of resources became more diffused following the change in electoral institutions. The analysis of the pre-World War II electoral reforms, provide further support that the vote concentration observed around the 1994 reforms are most likely determined by the electoral institutions and not something unusual about the 1990s political context.

While this paper is meant to highlight the relationship between electoral institutions and representation, the findings also raise a number of other potential research questions related to the impact of electoral institutions. The results suggest that institutions may influence the types of cues voters use to make their decisions. The existing literature tends to focus on the relative salience of party versus personal cues. One potential area for further research is to understand why certain cues, such as hometowns, would become the focus of voter and candidate behavior in particular institutional contexts. The hometown cue is particularly interesting because it has been found to be salient in a number institutional contexts outside Japan's MMD system.

The results also suggests that changes to electoral institutions may have a broader impact on society beyond the impact on representation. The changes in voting patterns and resource allocation suggest that LDP candidates in the MMD system may have fostered social connections in particular geographic areas that may not be fostered by the LDP candidates in the SMD system. While such claims are beyond the scope of this paper, the patterns described above suggest that examining the broader connections between electoral institutions and society may be worth pursuing.

APPENDIX

Overdispersed Binomial Regression and Binomial Regression with Random Effects

Two specifications are used to confirm that the hometown effect exists. The first specification aggregates across districts with an overdispersed binomial generalized linear model (GLM) with fixed effects. The second specification applies a binomial generalized linear mixed model (GLMM) with district fixed effects and municipality random effects.

Following Wand et al. (2001) and Mebane and Sekhon (2004), the municipality level votes are treated as counts. This is done by estimating a binomial model for candidate k 's vote count, y_{ijk} , out of the m_{ijk} ballots in municipality i of district j . Each voter's vote for candidate k is assumed to be a random variable x_{ijk} which has a Bernoulli distribution with probability p_{ijk} . However, the expected value of the probability that a voter from municipality i in district j votes for the candidate from party k is simply the probability that the mean voter from municipality i in district j votes for the candidate from party k , $E(x_{ijk}) = \pi_{ijk}$. The variance of x_{ijk} is simply the Bernoulli variance. The variance can then be written as $var(x_{ijk}) = \pi_{ijk}(1 - \pi_{ijk})$. Since the vote for candidate k , y_{ijk} , is simply the sum of all the individual voters' votes for candidate k , the unconditional mean and variance of y_{ijk} can be expressed as follows:

$$\begin{aligned} E(y_{ijk}) &= m_{ijk}\pi_{ijk} \\ var(y_{ijk}) &= m_{ijk}\pi_{ijk}(1 - \pi_{ijk}) \end{aligned}$$

Thus, votes are modeled as counts of individual voters' decisions rather than as shares.

Although each individual voter's probability of voting for candidate k , p_{ijk} , cannot be recovered due to the well known ecological inference problem, the only thing needed to estimate the above model is the expected value of the probability that a voter in municipality i and district j will vote for party k , π_{ijk} . Since p_{ijk} needs to be bounded in the interval $[0,1]$, π_{ijk} is simply assumed to have a logistic form:

$$\pi_{ijk} = 1/(1 + \exp(-z'_{ijk}\beta))$$

where z_{ijk} is a vector of covariates specific to municipality i in district j . b is a vector of coefficients. By employing a logit link function, the model is making the independence of irrelevant alternatives assumption.

The linear predictor employed is similar to the OLS specification used in the main text:

$$z_{ij}\beta = \alpha_i + \alpha_1 Jimoto_{ij} + \alpha_2 Distance_{ij} + \alpha_3 Distance_{ij}^2 + \alpha_4 Partisanship_{ij}$$

where j indexes the municipality and i indexes the district. As in the OLS model the fixed effect is also used to account for the candidate/district specific effects that do not vary across municipalities. In order to take into account the heterogeneity in variances across the districts, a dispersion parameter is added to the variance term. Thus, the variance of the y_{ijk} votes becomes:

$$var(y_{ijk}) = \sigma^2 m_{ijk} \pi_{ijk} (1 - \pi_{ijk})$$

σ^2 , which is known as the dispersion parameter, allows for the variance of y_{ijk} to be different than the nominal binomial variance, $m_{ijk} \pi_{ijk} (1 - \pi_{ijk})$. $\sigma^2 > 1$ would indicate that the variance of y_{ijk} is greater than the nominal variance. $0 < \sigma^2 < 1$ would indicate that the variance of y_{ijk} is less than the nominal variance.⁴²

In the binomial regressions with random effects, a random parameter, b_i , is included with the above linear predictor to capture the variation between municipalities. The random effects are assumed to be independent between municipalities.⁴³ The random effects are drawn from a normal distribution with variance γ^2 , $b_i \sim N(0, \gamma^2)$. Numerical integration problems with estimating this model are avoided by employing the Gibbs Sampler, which is monte carlo markov chain technique (see Clayton (1996)).

Substantively the results match the OLS results, which suggests that the results are robust to different specifications.

⁴²McCullagh and Nelder (1989) provide a discussion of the problems with clustering and the use of overdispersion parameters to correct for the problem.

⁴³Spatial autocorrelation between municipalities within districts could be taken into account with the random effect. The district boundaries with different candidates running in each district makes the spatial autocorrelation more difficult to model. Spatial autocorrelation is not taken into account in this analysis.

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Table 1 Distribution of LDP Support Japanese Lower House Elections, 1990-2000				
	1990	1993	1996	2000
Hometown	0.035* (0.016)	0.019 (0.015)	0.015* (0.008)	0.012 (0.010)
Distance	-0.006* (0.0009)	-0.007* (0.0008)	-0.001* (0.0005)	-0.0003 (0.0004)
Distance2	0.00004* (0.000007)	0.00005* (0.000007)	0.000008* (0.000004)	-0.0000004 (0.000003)
Normal Vote	0.881* (0.090)	0.985* (0.089)	1.127* (0.044)	0.994* (0.029)
Observations	1057			
Groups	59			

Standard errors clustered by candidate are in the parentheses.

* = statistically significant at the .05 level.

District fixed effects included

**Table 2. Home Area Effect
for Incumbent LDP, JSP and CGP Candidates
Japanese Lower House Elections, 1983-2000**

	1983	1986	1990	1993	1996	2000
Liberal Democratic Party Incumbents						
Distance	−0.039* (0.004)	−0.035* (0.004)	−0.032* (0.005)	−0.034* (0.005)	−0.005 (0.003)	−0.002 (0.003)
Obs Groups	2551 142	2860 164	2458 147	2233 132	1974 116	2088 125
Japan Socialist Party						
Distance	−0.013* (0.004)	−0.011* (0.004)	−0.011* (0.003)	−0.004 (0.004)		
Obs Groups	1074 56	773 42	931 56	506 30		
Clean Government Party						
Distance	−0.006 (0.004)	−0.005 (0.003)	−0.005* (0.002)	−0.008 (0.004)		
Obs Groups	152 11	170 11	107 7	69 7		

Standard errors clustered by candidate are in the parentheses. * = statistically significant at the .05 level. Candidate fixed effects included. Distance variable is divided by 10.

Table 3. Distribution of Government Transfers (1984-2002)				
Not Averaged	(1)	(2)	(3)	(4)
Minimum Distance	−0.011* (0.004)	−0.024* (0.008)	−0.012* (0.006)	−0.008 (0.009)
Out of Power * Minimum Distance	0.026* (0.007)	0.047* (0.010)	0.024* (0.007)	0.029* (0.010)
Post Reform * Minimum Distance	0.016* (0.005)	0.028* (0.008)	0.012* (0.006)	0.007 (0.008)
Per Capita Income			−0.016* (0.005)	−0.225* (0.066)
First Tier Industry			0.049 (0.033)	0.055 (0.053)
Dependent Population			0.092* (0.039)	0.299* (0.141)
LDP Vote Share			0.004 (0.002)	0.034* (0.016)
RMSE	0.029	0.412	0.028	0.338
Obs	29737		22827	
Averaged	(5)	(6)	(7)	(8)
Minimum Distance	−0.017* (0.004)	−0.033* (0.008)	−0.017* (0.006)	−0.013 (0.009)
Out of Power * Minimum Distance	0.027* (0.008)	0.043* (0.010)	0.026* (0.007)	0.026* (0.010)
Post Reform * Minimum Distance	0.019* (0.005)	0.034* (0.008)	0.017* (0.006)	0.014 (0.009)
Per Capita Income			−0.014* (0.006)	−0.160* (0.075)
First Tier Industry			0.059 (0.042)	0.052 (0.061)
Dependent Population			0.083 (0.046)	0.242 (0.151)
LDP Vote Share			0.006* (0.003)	0.046* (0.017)
RMSE	0.028	0.374	0.026	0.357
Obs	15091		12834	

Standard errors clustered by municipality are in the parentheses. * = statistically significant at the .05 level. Municipality fixed effects included. Variables in models (2), (4), (6), and (8) are in logs. Distance variable is divided by 10 in regression (1),(3),(5), and (7). Regressions (1), (2), (5), and (6) include the years 1984 to 2002. Regressions (3), (4), (7) and (8) include the years 1988 to 2002.

Table A.1 Results from Overdispersed Binomial Regression Model and Binomial Regression with Random Effects Model				
	1990 Lower House Election		1993 Lower House Election	
	Overdispersed	R.E.	Overdispersed	R.E.
Hometown	0.075* (0.058)	0.097 (0.087)	−0.017 (0.055)	0.079 (0.078)
Distance	−0.035* (0.003)	−0.038* (0.003)	−0.037* (0.003)	−0.036* (0.003)
Distance ²	0.0003* (0.00003)	0.0003* (0.00002)	0.0002* (0.00002)	0.0002* (0.00002)
Normal Vote	5.160* (0.244)	4.637* (0.261)	5.416* (0.230)	5.001* (0.214)
Constant	−2.193* (0.158)	−1.645* (0.147)	−2.011* (0.145)	−1.687* (0.134)
σ^2	0.293*	(0.013)		0.241 (0.011)
Dispersion	452.63		397.43	
	1996 Lower House Election		2000 Lower House Election	
	Overdispersed	R.E.	Overdispersed	R.E.
Hometown	−0.0009 (0.027)	0.078* (0.037)	−0.012 (0.027)	0.072* (0.0358)
Distance	−0.008* (0.001)	−0.006* (0.001)	−0.005* (0.001)	−0.001 (0.001)
Distance ²	0.00005* (0.)	0.00004* (0.00001)	0.00003* (0.00001)	0.00000 (0.00001)
Normal Vote	5.372* (0.117)	5.267* (0.107)	4.625* (0.117)	4.662* (0.104)
Constant	−1.880* (0.067)	−1.815* (0.072)	−1.259* (0.064)	−1.273* (0.077)
σ^2		0.051* (0.002)		0.052* (0.002)
Dispersion	103.28		112.91	