Do Individual Representatives Influence Government Transfers? Evidence from Japan[1]

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Abstract

Although the conventional wisdom is that representatives to the Japanese Diet are "pipelines" between the national treasury and local constituents, who have great influence over the distribution of central government transfers to and within their districts, the systematic empirical evidence that this influence exists is relatively weak. This paper uses two identification strategies to estimate how much individual Lower House Liberal Democratic Party (LDP) incumbents influence the distribution of government transfers during the period 1977 to 1992: 1) the exogenous change in representation following the midterm deaths of Japanese representatives; 2) the discontinuity surrounding elections where LDP candidates win or lose by very narrow margins. Overall, the influence of politicians on central-to-locality transfers is relatively small. However, the presence of a marginal LDP incumbent leads to about a 10% to 30% increase in per capita central government transfers to the municipalities where the incumbent has substantial electoral support.

1. Introduction

Academics, politicians and the popular press often claim that national representatives use public expenditures to increase their re-election prospects. Japanese politicians are especially notorious for being "pipelines" between the central government transfers and their constituents (Fukui and Fukai 1996).[1] The high speed rail-line line from Tokyo to Niigata is often viewed as an example of how former prime minister Tanaka Kakuei was able to influence central government funds to benefit his constituents.[2] Understanding that politicians serve as "pipelines" between the national treasury and local constituents is often believed to be central to understanding Japanese politics.[3] This paper attempts to estimate how much individual representatives are able to "pipeline" central government funds to their constituents.

Despite this popular perception, there is reason to believe that individual representatives have only limited influence over public expenditures. First, Japanese political parties seeking to maximize the electoral fortunes of the party as a whole may regulate the distribution of government resources to each representative's constituency (McCubbins and Nobles, 1995; Reed, 1986).[4] Second, a more traditional view suggests that the bureaucracy, which is perceived to have control over policy making, may shield the allocation of government funds from the demands of politicians.[5] Finally, the empirical studies of Japanese public expenditures find decidedly mixed evidence that individual politicians, or even political parties, influence public expenditures (Tamada, 2006; Doi, 2001; Horiuchi and Saito, 2003; Kobayashi, 1991).

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[1]In describing the activities of former prime minister Nakasone, Thayer (1969, p94) writes "Nakasone is called upon by the towns and villages to assist them in obtaining funds from the government for the construction of new facilities or the repair of existing facilities....Each of these projects in the countryside stands as concrete testimony of the effectiveness of Nakasone as a member of the Diet. The secretaries are not at all hesitant about pointing these landmarks out."

[2]See Johnson (1986) and Schlesinger (1997).

[3]This "pipeline" is a common explanation for the LDP's electoral dominance (Hirose 1981; Scheiner 2006). Fukui and Fukai (1996, p268) write, "There is a solid consensus among students of Japanese politics about the centrality of pork barrel politics in both parliamentary (Diet) and local elections in Japan."

[4]McCubbins and Noble (1995, p66) write, "Within PARC divisions and committees, backbenchers naturally press constantly for expanded spending in their policy areas, but the real decision-making power is in the hands of a relatively small group of chairmen and vice-chairmen. And for all the talk of subgovernments, one of the key criteria by which these committee leaders are judged in the contest for top government and party posts is breadth of experience and ability to overcome particularism."

[5]Johnson (1982, p20-21) writes, "the elite bureaucracy in Japan makes most major decisions, drafts virtually all legislation, controls the national budget, and is the single source of all major policy innovations in the system."

This paper contributes to the broader debate over whether public expenditures are allocated according to the effort and ability of individual politicians or to the centralized plan of political party elites or bureaucrats.[6] Much of the empirical literature of distributive politics outside Japan focuses whether and how centralized political parties influence the distribute funds and less on the influence of individual representatives (Denemark, 2000; Dahlberg and Johansson, 2002; Dasgupta et. al., 2004; Case, 2001). Even in the United States, where political parties have traditionally been viewed as weak organizations, there is evidence that public expenditures are directed to the parties' electoral bases (Ansolabehere and Snyder, 2003; Levitt and Snyder, 1995), and mixed evidence that individual U.S. congressmen direct federal outlays.[7] Thus, Japan is a good test of the influence of individual politicians because based on popular perceptions, we should observe individual representatives having a large impact on central government spending in their local districts.

One of the challenges to identifying the causal link between individual politicians and public expenditures separate from political parties or other factors is the absence of exogenous variation in individual representatives. Each geographic region is assigned a fixed number of representatives, so in normal circumstances there is no variation in the number of representatives. Even if we assume that certain types of representatives have greater influence over public expenditures, making causal inferences is difficult since elections, in general, are not random assignment mechanisms.[8] Factors such as shocks to the local economy are likely to affect both electoral outcomes and public expenditures.

The main innovation of this paper is the use of two different identification strategies to separate the effect of individual politicians on government transfers from unobservable factors that may affect both representation and government transfers. Both strategies take

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[6]This debate has a long history in American politics. See Weingast and Shepsle (1994) and Levitt and Poterba (1999) for a review of this literature. The recent literature suggests that individual Congressmen may maximize their re-election prospects by allowing party elites to make decisions that increase the collective good of the party (Kiewiet and McCubbins, 1991; Cox and McCubbins, 1993).

[7]The lack of evidence that individual U.S. Congressmen influence public expenditures is reflected in this quote from Levitt and Snyder (1997, p961): "There is far less evidence that committee membership allows representatives to increase the total amount of resources directed to their district (Ray 1982 is an exception). The relationship between congressional seniority and federal outlays also appears to be weak."

[8]This is an issue often raised in the literature on the distribution of expenditures in America (e.g. Levitt and Snyder, 1997; Fiorina 1981; Rivers and Fiorina 1989; Stein and Bickers 1995).

advantage of variation in representation that is close to being randomly assigned. The paper focuses on the period from 1977 to 1992 when Japanese politicians were perceived to have significant influence on government transfers.

The first identification strategy uses the panel structure of government transfers and the exogenous shock to representation following the passing away of Japanese politicians who are not replaced during their term in office.[9] I use the variation in deceased representatives to identify whether certain characteristics of the representatives, such as partisan affiliation, seniority and previous electoral support, also influence the allocation of government transfers across and within electoral districts.

The second identification strategy uses the discontinuity in representation inherent in close elections. Under certain assumptions, focusing on districts where candidates win or lose by very narrow margins also addresses some of the issues of non-random assignment of representatives. The basic intuition is that if there is no difference in candidates' vote shares, then the winner would be determined at random. Thus, the outcome of extremely closely elections can be attributed to the randomness in vote outcomes (Lee, 2005; Lee, Moretti and Butler, 2002; Linden, 2004; Miguel and Zaidi, 2003).[10] This research design is used to estimate the impact of a marginal LDP incumbent on government transfers.

The two analyses complement one another. The analysis of deceased representatives allows us to examine the effects for electorally safe and unsafe representatives from any party, but the sample size is small for any particular group. In contrast, the second analysis provides a larger sample of marginal representatives which are the type of incumbents that the first analysis suggests should have an effect on government transfers. However, focusing on close elections does not allow us to make inferences about electorally secure representatives,

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[9]A few papers have also used the passing of politicians as an exogenous shock to estimate the effect of representation on public policy (Jones and Olken, 2005; Roberts 1990). Jones and Olken (2005) examine how the death of leaders affected national economic conditions. Roberts (1990) examines how the death of senator Henry "Scoop" Jackson affected the stock prices of companies related to his home state of Washington. Johnson, Magee, Nagarajan and Newman (1985) examines the impact of CEO deaths on firm performance. However, this is the first paper that uses the death of legislators to estimate the impact of representatives on public expenditures.

[10]This design is particularly suitable for the pre-1994 multi-member district single non-transferable vote system (described in section 2) since the coordination issues in these systems are likely to increase the randomness of electoral outcomes.

for which we rely on the results from the deceased representative analysis. In addition to checking the robustness of the results from the first analysis, the close election analysis investigates how characteristics of marginal representatives correlate with government transfers.

The analysis of deceased representatives shows that overall, individual Lower House representatives do not have much of an effect on the allocation of government transfers either across or within electoral districts. The one exception is LDP incumbents who are elected by a small margin in the previous election. The municipalities where these marginal LDP representatives had high vote shares in the previous election have between 10% to 30% lower national treasury disbursements after the representative passes away. The close election analysis confirms that the election of marginal LDP representatives have a positive effect on national treasury disbursements to the representatives' core electoral support municipalities. This finding that marginal representatives direct transfers to their electoral base is consistent with theoretical predictions (Cox and McCubbins, 1986; Myerson, 1993) as well as previous empirical findings (Hirano, 2005).

The remainder of this paper will be divided into 5 sections. Section 2 will discuss some relevant features of Japanese politics. Section 3 will discuss the specification and data. Section 4 will present the analysis using representatives who pass away during the pre-1994 electoral system. This section presents results for both the national and prefectural government transfers. Section 5 presents the results of the regression discontinuity analysis, for the pre-1994 system and also some initial results for the post 1994 system. Section 6 discusses the results from the two analyses and the conclusions.

2. The Japanese Case

Japan's politics have a number of features which are particularly important for this analysis: 1) the large amount of central-to-locality government transfers; 2) the electoral institutions; and 3) the LDP's control over the government.

Whether politicians influence the allocation of national government transfers to localities is a major issue in Japan in part because central-to-locality transfers make up a large amount of total government expenditures. Roughly 60% of general tax revenue goes to the national government and 40% goes to the local government. However, roughly 60% of government

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expenditures are at the local level and 40% are at the national level (Shirai, 2005).[11] Conventional wisdom is that LDP politicians manipulate the allocation of national government expenditures to the municipalities for their own electoral gains (Hirose, 1981).

About 90% of central government grants are transferred to localities in the form of *chiho kofuzei* (local allocation tax or LAT) or *kokko shishutsukin* (national treasury disbursements). The LAT is an unconditional, or non-earmarked, grant given to localities. These grants, which make up over 20% of local government revenue, are distributed according to a formula based on the localities' needs. The national treasury disbursements are conditional grants distributed by the central government. These grants, which make up roughly 14% of local government revenue, are used to fund several types of programs including compulsory education, disaster relief, health and welfare, and construction. Previous studies claim that LDP representatives have substantial influence on national treasury disbursements (Doi, 2001; Kobayashi 1991).[12] Thus, the analysis below will examine the combined central government transfers (LAT and national treasury disbursements) and also national treasury disbursements separately.[13]

In addition to the central government transfers allocated directly to localities, transfers that pass through the prefectures before being distributed to the localities are also included in the analysis below. Since national Diet representatives are known to have substantial political power in their home prefectures, some claim that they also influence the prefectural treasury disbursements, *ken shishutsukin* (Kobayashi, 1991).

Prior to 1994, Japan's unique electoral institutions provided strong incentives for individual politicians to influence the central government transfers. The electorate for the more powerful Lower House was divided into 129 multi-member districts.[14] Between two

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[11]Mochida (1997) shows that among OECD countries, Japan is unique in terms of high degree of government transfers from the central government to localities and the high proportion of local to total government expenditures.

[12]LAT has traditionally been perceived as being less open to political intervention on a year-to-year basis since it is based on a formula.

[13]Some claim that LAT is also politicized. An analysis of the LAT yields some mixed findings that are very sensitive to specification, and thus are not presented in this paper. Further research should be done on the politicization of LAT.

[14]Japan has a parliamentary system with an Upper and Lower House. Elections for the Lower House are held every four years, unless there is a vote of no confidence in the Diet. The Lower House is considered more powerful than the Upper House since it can pass legislation without Upper House approval.

to six representatives were elected from each district. Voters were given only one single non-transferable vote that could be cast for a specific candidate. The multi-member district single non-transferable vote system will be referred to as the MMD system. Political parties attempting to gain a majority in the Diet were forced to nominate more than one candidate in any given electoral district. Thus for many candidates the main electoral threats came from the candidates with whom they shared a common partisan affiliation.

MMD systems provide strong incentives for individual politicians to direct resources both to and within their electoral districts. Candidates in MMD systems who competed against members from the same party and have votes cast directly for candidates have strong incentives to cultivate their personal reputations which are separate from their party's reputation (Carey and Shugart, 1993). Providing central government transfers was perceived as one way for incumbents to build their personal reputations among their constituents.[15]

MMD systems also provide strong incentives to target their resources to narrowly defined sub-constituencies within their districts (Myerson, 1993). A candidate competing for one of N seats in a district can guarantee electoral victory by securing $(\frac{100}{N+1} + \epsilon)\%$ of the vote. Japanese politicians are known to have their electoral support concentrated in geographic bailiwicks known as *jiban*.[16] Figure 1 illustrates the geographic distribution of candidates' vote shares within Akita 2nd district in 1983 which was under the MMD system. This figure illustrates the geographic division and concentration of candidates' electoral support. The analysis below will test whether incumbents direct government transfers to their electoral bases.

Of all the Japanese incumbents, we would expect the LDP members to have the greatest influence over public expenditures. The LDP has dominated the Japanese government since 1955, with the exception of one year between 1993 and 1994. The old MMD system required the LDP to nominate more than one candidate per district in order to maintain their control of the government. Thus, individual LDP incumbents had strong incentives to cultivate their personal reputations for influencing the allocation of central government transfers to

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[15]Campbell (1977, p280) writes "Japanese politicians tend to perceive voters as animated almost solely by particularistic, pork-barrel desires rather than by concern over issues of broad social policy."

[16]Hirano (2005) provides some empirical evidence that the geographic concentration of Japanese incumbents' electoral support and resource allocation is closely tied to electoral institutions.

and within their districts. The literature on the politics of Japanese public expenditures has concentrated almost exclusively on the LDP. There are numerous anecdotal accounts of LDP incumbents claiming to influence public expenditures on behalf of their constituents.[17] The research design using representatives who pass away will allow us to test whether LDP incumbents have a bigger influence on public expenditures than non-LDP incumbents.

Despite the perception that LDP politicians campaign on personal rather than party reputations, the LDP is a highly structured organization with a clear set of elites who maintain the party's policy positions and electoral fortunes (Sato and Matsuzaki, 1986). Thus, some claim that the party elite regulates local budgetary allocations in order to promote the interests of the party as a whole.

3. Data and Specification

This study focuses on the allocation of national and prefectural government transfers to localities between 1977 and 1992, during which time there were five elections for the Lower House of the Japanese Diet (1979, 1980, 1983, 1986 and 1990).[18] Two separate analyses are used to estimate the influence of individual politicians on central-to-local government transfers.

Specification using Legislators Who Pass Away

In the first analysis, we use the exogenous change in representation following the death of a legislator and the panel structure of the data to identify the effect of individual representatives on central-to-local government transfers. The basic specification is as follows:

$$S_{i_e t} = \alpha_{i_e} + \omega_t - \gamma \frac{D_{i_e t-1}}{N_i} + \epsilon_{i_e t} \tag{1}$$

where $S_{i_e t}$ is per capita central-to-local government transfers directed to district i in year t and legislative session e. $D_{i_e t-1}$ is an indicator variable for whether representative k in

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[17]Fukui and Fukai (1996, p268) write, "For much of the postwar period, but especially from the mid-1950s to the early 1990s, the role and performance of Diet members in pork barrel politics made or broke their political careers."

[18]Because of the political changes in 1993, we limit the sample to period 1977 to 1992. In 1993, the LDP lost control of the government for the first time after several members defected from the party.

district i dies at time $t-1$ of legislative session e.[19] N_i is the number of representatives for the district i. Since death is assumed to be exogenous, it is uncorrelated with observable and non-observable factors that may potentially influence both government transfers and electoral outcomes. Also since we are looking at the changes within legislative sessions, we can identify γ the general effect of losing a legislator, without assuming that LDP and non-LDP incumbents have different effects on public expenditures.

The fixed effect, α_{i_e}, varies by legislative session. This takes into account district characteristics that influence transfers but do not vary substantially between elections. Allowing fixed-effects to vary in this way should also take into account political changes that occur following each election, such as the partisan composition and seniority of the district's representatives.[20]

Furthermore, we can add additional characteristics of representatives into the specification to not only separate out the effects for LDP and non-LDP incumbents, but also to estimate whether incumbents who serve several terms or who are elected by narrow margins differ from other representatives. This specification is:

$$S_{i_et} = \alpha_{i_e} + \omega_t - (\gamma_1 + \gamma_2 T_{i_e} + \gamma_3 P_{i_e})\frac{LD_{i_et-1}}{N_i} - (\delta_1 + \delta_2 T_{i_e} + \delta_3 P_{i_e})\frac{OD_{i_et-1}}{N_i} + \epsilon_{i_et} \qquad (2)$$

P_{i_e} is whether the deceased incumbent has been elected for several terms. T_{i_e} is whether the deceased incumbent did poorly in the election to legislative session e. LD_{i_et-1} is whether an LDP representative passes away. OD_{i_et-1} is whether a non-LDP representative passes away. Although the conventional wisdom is that LDP representatives are the ones who manipulate government spending, some claim that opposition members may also influence these government transfers.[21]

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[19]We assume that legislators influence the subsidies distributed in period t through their activities at time $t-1$.

[20]There is an issue of what year the fixed effect should start for each legislative session. Since the fiscal years start on April 1st, the negotiations for the budget begin as far back as the summer in the previous fiscal year and budgets are submitted to the Diet in the few months before the March 31 deadline. Several supplemental budgets are introduced as late as the fall of the fiscal year. Thus, if an election occurred after October of fiscal year t, the newly elected representatives are assumed to affect the public expenditures in fiscal year $t+1$.

[21]Campbell (1977, p117) writes that "local areas governed by opposition parties perhaps are not greatly

The logic for including P_{i_e} is that in general, representatives who serve several terms, hereafter referred to as senior representatives, are believed to have more influence over policy, including budget allocations.[22] Chairmen of committees and cabinet minister positions are assigned according to seniority (see Brady *et. al.* (1997)).[23] P_{i_e} is simply an indicator variable for whether deceased candidate in district i of legislative session e served more than three terms. P_{i_e} is assumed to be constant throughout each legislative session.

The rationale for including T_{i_e} is that incumbents who do especially poorly in the previous election may behave differently than those who are more electorally secure. In the United States, electorally insecure congressional representatives are known to allocate more resources to their constituents.[24] T_{i_e} is an indicator variable for whether the representative came in last place in the MMD (*e.g.* in the four member district, T_{i_e} equals one when deceased incumbent has the fourth highest vote shares in election preceding e). The candidates with the lowest winning vote share is referred to as being marginal.[25] T_{i_e} is constant through each legislative session.

It is important to note that the above specification does not separate the direct effect of the incumbent on government transfers from the effect of the incumbent on the other candidates' behaviors. We can only capture the total effects.[26]

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disadvantaged in the allocation of central government funds, though they may lose some marginal appropriations, and opposition Dietmen have also been known to petition successfully for local interests."

[22]Fukui and Fukai (1996, 279) write, "of the two districts into which Okayama Prefecture was divided under the old multiseat lower house election system, Okayama-2, represented by Hashimoto and another veteran LDP legislator- Mutsuki Kato, is known to have received considerably more financial help from the national government than Okayama-1, which was represented by much younger and less known Diet members."

[23]LDP Diet members could expect to receive a committee chairmanship during their fourth or fifth term in office.

[24]Bickers and Stein (1995) find some empirical evidence that congressional representatives who do poorly in a given election allocate have more government projects allocated to their electoral district.

[25]Marginal only refers to the candidate's position in the last election and not to the candidate's position in policy making.

[26]We might expect a bias away from finding an effect if the other incumbents increase their efforts in response to legislator who passes away. This may occur if the other incumbents now see an opportunity to attract some of the supporters of the deceased legislator. Alternatively, the other incumbents may be worried that the death may spark a number of challengers to enter the next election. There is reason to believe that the remaining incumbents' behavior may not change significantly since in almost all of the cases being examined, the incumbent who passed away was replaced in the next election, but not before, by a relative or a member of their staff whom we expect would appeal to the same electoral base as the deceased incumbent. In addition, Fukunaga Kenji of Saitama 5th district is an example where there were no remaining LDP incumbents after he passed away. The change in subsidies to Fukunaga's district was not different from

We can also use municipality level data to test whether representatives allocate more government transfers to their electoral bases. The specification for this analysis is as follows:

$$S_{i_e mt} = \alpha_{i_e m} + \omega_t - \gamma \frac{D_{i_e t-1}}{N_i} - \delta C_{i_e m} D_{i_e t-1} + \epsilon_{i_e mt} \tag{3}$$

where $C_{i_e m}$ is an indicator variable for whether municipality m was one of the deceased incumbent's core support areas in the election to legislative session e.[27] In Section 2, we discussed why candidates in MMD systems have an incentive to concentrate their resources in narrow geographically defined constituencies. Thus, we might also expect the biggest decline in public expenditures in areas where the incumbent had a large number of supporters. Municipalities are coded as being part of the candidates' core electoral base if the candidate received more than 30% of the vote in the locality.[28]

As in equation (2) above, γ and δ can be expanded to examine how particular characteristics of representatives, such as their seniority and their rank in the previous election, can influence the allocation of government transfers within districts.[29]

Specification using Close Elections

The estimation for the analysis of close elections in Section 5 uses a similar, but slightly different, specification in equation (3). Since the analysis focuses only on competition for the last seat in the district, the estimated effect is only for those who do relatively poorly in the previous election – *i.e.* where T_{i_e} equals one. The specification is as follows:

$$S_{i_e m} = \alpha_{i_e} + \theta_1 C_{i_e m} + \theta_2 C_{i_e m} W_{i_e} + \epsilon_{i_e m} \tag{4}$$

where W_{i_e} is an indicator variable for whether LDP candidate won the last seat in district i in the election to legislative session e. $\gamma \frac{\sum_{j=1}^{N_i} W_{ije}}{N_i}$ and ω_e are absorbed into α_{ie}. θ_1 measures

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the patterns observed for the districts with remaining LDP incumbents. Furthermore, we do not observe an unusually large number of the remaining incumbents losing the next election in the districts of deceased representatives, which we might expect to see if incumbents became more vulnerable.

[27]Since core electoral support is specific to a candidate, $D_{i_e t-1}$ is not divided by N_i when interacted with $C_{i_e m}$.

[28]The statistical significance of the results are not sensitive to changes in the cut-off as shown in Table 5 of section 4.

[29]The full specification including the characteristics of the representatives becomes $S_{i_e mt} = \alpha_{i_e m} + \omega_t - (\gamma_{1L} + \gamma_{2L} T_{ike} + \gamma_{3L} P_{i_e}) \frac{LD_{i_e t-1}}{N_i} - (\delta_{1L} + \delta_{2L} T_{i_e} + \delta_{3L} P_{i_e}) C_{i_e m} LD_{i_e t-1} - (\gamma_{1O} + \gamma_{2O} T_{i_e} + \gamma_{3O} P_{i_e}) \frac{OD_{i_e t-1}}{N_i} - (\delta_{1O} + \delta_{2O} T_{i_e} + \delta_{3O} P_{i_e}) C_{imke} OD_{i_e t-1} + \epsilon_{i_e mt}$

the difference in government transfers that municipality m receives from being part of LDP candidate's core support in district i as compared to other municipalities in the district.[30] Since the discontinuity design in Section 5 focuses on the competition for the last seat, θ_2 should be of relatively similar size as δ_2 in equation (4).

For this analysis, we restrict the sample to those where the difference between the winner of the last seat and first runner up is very small. In these narrow elections, whether the LDP candidate wins or loses can be due to random variability in election outcomes. Thus, W_{i_e} could be considered to be orthogonal to the observable and non-observable factors that may potentially influence both government transfers and electoral outcomes.

Additional covariates for district or municipality characteristics are included in the specifications estimated below. Although $D_{i_e t-1}$ and W_{i_e} should in theory be orthogonal to these covariates, they help with the precision of the estimates of interest. The three additional covariates are the proportion of the work force engaged in first-tier industries, the proportion of the population considered to be dependent, and the income per capita.[31]

The municipality level economic, demographic and transfer data were gathered from the *Nikkei NEEDS* database and various issues of the *shichosonbetsu kessan jyokyo shirabe*. All the nominal monetary variables are converted into real terms. The electoral data comes from JED-M. Some of the district level information about elections comes from Steven Reed's Election CD. There are over 3,000 municipalities within Japan's 47 prefectures. This data is aggregated to the district level for some analyses. In this paper, I focus on the period between 1977 to 1992. Prior to 1977, this data on fiscal transfers is not readily available at the municipality level. The period after 1992 is excluded because of the changes in the political system after 1992. A brief analysis of the period following the 1994 electoral reforms is presented in section 5.

4. Legislators Who Pass Away In Office

Since multiple members represented the same geographic district under the old MMD

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[30]This is absorbed into α_{im} in equation (3).

[31]These are not available on a year-to-year basis but rather on a 5-year basis. The inter-years are simply linearly imputed. Future version of this paper will also include a measure of municipality fiscal strength (required revenue/required expenditures). A preliminary analysis with this variable does not yield any substantive changes in the results.

system, there was less urgency to fill vacated seats as the other representatives of the district could insure that the district's interests continued to be represented in the Diet. Under the old MMD system, special elections were primarily reserved for situations where a district lost two Diet members due to death or retirement.[32] The fact that most Diet members who passed away while in office were not replaced allows us to test the impact of losing a representative on the distribution of central government transfers.

The research design also relies on existence of a significant number of exogenous deaths of legislators while in office. The data on LDP deaths was gathered from various issues of the *Seiji Handobukku*, the *Kokkai Binran*, and the *Asahi Shimbun*. Figure 2 shows the number of Diet members who passed away while in office during the period 1958 to 1995. The downward trend in the number of Diet members who die while in office most likely reflects the improvement in health care.

During the relevant period for this study, 1977 to 1992, sixty-seven Lower House Diet members passed away while in office. Forty-seven of these Diet members were affiliated with the LDP. Fourteen were affiliated with the Japan Socialist Party. The remainder were affiliated with the Democratic Socialist Party (5) or the New Liberal Club (1). The estimated effects are identified with only a subset of these observations since those who pass away just before an election year do not provide any additional information for the analysis.[33]

Since the research design of this paper relies on deaths being exogenously determined, we want some confirmation that the deaths were not related to the allocation of government transfers. Information about specific deaths of the candidates was gathered from the Diet members' obituaries found in various issues of the *Asahi Shimbun*. Table 1 lists the various causes of the death among the Diet members. Some type of heart-related illness was the most common cause of death among the Diet members followed by cancer. Currently,

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[32]There are some exceptions where representatives were replaced even though there was only one representative who passed away. Urano Sachio of Aichi 4th District was replaced on January 21, 1977. Urano died on January 16, 1977, a little over a month after being elected to office on December 5, 1976. The other was Tamaki of Kyoto 2nd District. Tamaki died on December 26th, 1978.

[33]The analysis presented in this paper makes a strict assumption that any impact of a deceased legislator in legislative session e will disappear in the election year to legislative session $e + 1$. The assumption is that the newly elected representatives will immediately be able to compensate for the previous absence of a representative. The results are not sensitive to relaxing this assumption.

cardiovascular diseases and cancer are the two leading causes of death within the Japanese population as a whole.[34]

Another concern is that the incumbents who died may be different from other incumbents, in particular, that they are much older than other incumbents so their passing should not be considered a sudden exogenous shock. This could bias away from finding an effect if politicians who are expected to pass away soon are given a smaller share of government transfers. This could bias towards finding political influence if the older politicians have greater influence over public expenditures. Figure 3 plots the age of death by year for the Diet members who passed away while in office. This figure also plots the average life expectancy of Japanese at birth for each 5 year period between 1975 to 1995. The age of death of the Diet members who passed away while in office tended to be lower than the average age of death for the general population. The relatively young age of the Diet members who passed away suggests that many of the deaths were not likely to have been expected based on age alone.

The simple summary statistics in Table 2 reveals that transfers to municipalities were higher where an LDP member passed away which is the opposite of what we expect. These municipalities also tended to be low-income, have a high proportion of the work force in first tier industries and have a high proportion of their population under 15 or over 65, which are municipality characteristics commonly associated with support for the LDP.[35] The simple summary statistics show that the transfers are lower in the municipalities where a non-LDP member passes away than other municipalities.

The district level estimates of equations (2) and (3) from section 3 are presented in Table 3. Three types of transfers are examined in this table. The first is the aggregate central government transfers, LAT plus national treasury disbursements. The second is national treasury disbursements. The third is prefectural treasury disbursements. Columns (1), (3), and (5) presents the results separating LDP and non-LDP politicians. Finally columns (2), (4), and (6) examine whether the effect differs for senior and/or marginal LDP

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[34]There is the possibility that heart-related diseases, suicides and murders may not be exogenous. Removing them from the analysis does not substantively change the results.

[35]It is not so surprising that the areas with more LDP members are also more likely to have an LDP representative pass away while in office.

representatives. The political variables are all divided by the number of seats in the district.[36]

There is no statistically significant evidence that losing any type of Diet member affects the overall amount of transfers directed to particular electoral districts. The partisan affiliation of incumbents who passed away also does not appear to have affected their ability to influence government transfers to their home districts. As the coefficients in all of the columns indicate, neither LDP nor non-LDP incumbents who passed away appeared to have a statistically significant impact on the overall transfers to their districts. The magnitudes of the coefficients are also small. The coefficients on the indicator for whether an LDP member died is negative for the national transfers as expected. The coefficients in columns (2), (4), and (6) provide no statistically significant evidence that the senior LDP incumbents, those who win more than three elections, or the marginal LDP incumbents, those who had the lowest winning vote share in the previous election, affected the distribution of national or prefectural transfers to their districts.

The municipality level results presented in Table 4 do not provide much evidence that incumbent Diet members affected the distribution of government transfers within their districts except in the case of national treasury disbursements to marginal LDP members. The only statistically significant drops in national treasury disbursements were to the municipalities where the marginal LDP incumbents drew a large amount of electoral support.

Table 5 presents the results from focusing on the allocation of national treasury disbursements to core electoral support areas of marginal candidates varying the requirement for a municipality to be considered as part of a candidate's core electoral support between 20% and 35%. These areas, which were part of the marginal LDP incumbent's core support, have between 14% and 32% lower per capita government transfers after the LDP incumbent passed away, depending upon how the core electoral support is defined. These findings are consistent with the theoretical prediction that candidates will favor their core supporters in MMD systems (Myerson, 1993). The results on the bottom of Table 5, which does not log the variables, suggests that the death of a marginal LDP incumbent led to an average of 10000 to 27000 yen (in 1987 yen) decline in per capita government transfers to the incumbent's

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[36]The substantive results do not change significantly if the political variables are not weighted by the number of seats.

core support municipalities.[37]

The effect of losing a marginal LDP incumbent on central government transfers is illustrated in Figure 4, which plots the average of the log of national treasury disbursements (subtracting out the district and year means) for the core support municipalities of all LDP incumbents, senior LDP incumbents, and marginal LDP incumbents. This figure shows that the core electoral support municipalities of marginal LDP incumbents who pass away have the biggest drop in national treasury disbursements. This effect is most prominent in the first year after the incumbent passes away.

Contrary to the popular perception, there is no evidence that senior LDP incumbents had a statistically significant effect on the distribution of any type of transfer. This result is not sensitive to the number of terms used to indicate seniority. This is consistent with the idea that more powerful LDP incumbents tend to be more electorally secure so the incumbent and the political party have less incentive to direct year-to-year allocations to these these incumbents' core support areas. Senior LDP incumbents are known to have other means to cultivate their constituents that involve less effort and/or less uncertainty about claiming credit.[38] The possibility that senior incumbents influence other types government spending is discussed in the conclusion.

The data limitations leave several issues unaddressed, such as: 1) the robustness of the results since the sample of marginal LDP incumbents who pass away is rather small; and 2) whether senior marginal LDP have more of an effect on transfers as compared to the junior low-ranked members. The close election analysis in the next section addresses these issues.

5. Close Elections

This section focuses on the close elections where the LDP legislators compete for the last seat in a district. Political economists have increasingly been making use of the discontinuity around election outcomes to test the effect of winning office on various political outcomes.[39]

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[37]The magnitude of the coefficients in Table 5 reflect the fact that national treasury disbursements are divided by 1,000,000.

[38]We would expect that senior LDP members who accumulate more campaign contributions are able to fund more constituency service activities. See Curtis (1988) for a description of some of these activities.

[39]See Lee, 2005; Lee, Moretti and Butler, 2004; Linden, 2004; Miguel and Zaidi, 2003. Miguel and Zaidi use a regression discontinuity design to examine expenditures in Ghana.

Under certain conditions, whether a candidate wins this last seat in a very close election can be considered to be randomly assigned (Lee, 2005). This design is used to test the impact of an individual LDP candidate on government transfers.

This analysis of close elections is meant to complement the analysis of deceased representatives. Thus, in section, we focus on the effect of marginal LDP incumbents on the distribution of national treasury disbursements within districts. We discuss some other results briefly at the end of the section.

Since we are focusing on LDP candidates who compete for the last seat in a district, we exclude districts where non-LDP candidates hold both the last and runner-up positions. Only districts where either or both of these positions are occupied by the LDP are included in the analysis. Districts where LDP candidates occupy both of these positions are included since we are interested in comparing the allocation of transfers within the districts and not between districts.[40]

The close elections are analyzed in two ways. Both approaches focus on how national treasury disbursements to municipalities in LDP candidates' core electoral support differ depending upon whether the candidate is in office or not.[41] The first approach examines the average difference in transfers to these municipalities for elections where the difference in vote shares for the candidate winning the last seat and the first runner up is less than 2% or less than 1%.[42] The second approach uses all municipalities and includes polynomials of the vote difference as well as these polynomials interacted with an indicator variable for whether the LDP incumbent won.[43] Since we cannot include the district fixed effects in this analysis, the dependent variable and the three additional covariates are deviations from the district mean values for these variables, and the sample is limited to municipalities which

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[40]The results are substantively the same if we only focus on cases where an LDP candidate competes against non-LDP candidates for the last seat in the district.

[41]As above, the municipalities where a candidate receives more than 30% of the vote are considered to be part of the candidate's core electoral support.

[42]The 1% and 2% levels reflect the difference in the vote share for the winner of the last seat in the district minus the vote share for the first runner-up in the district. The results are the same even if a 0.5% threshold is used. However, there is a tradeoff with the reduction in the number of observations. This difference is smaller than the 4% window used in Lee, Moretti and Butler (2002).

[43]I use third order polynomials. The specification for the polynomial is $S_{imt} = \kappa_0 + \kappa_1 W_{ikt} + \sum_{z=1}^{3}(\kappa_{2z}V^z + \kappa_{3z}V^z W_{ikt}) + X_{imt}\beta + \epsilon_{imt}$. This type of polynomial specification is commonly applied to analyses of discontinuities based on election outcomes (Lee, 2005; Linden, 2004; Miguel and Zaidi, 2003).

are part of the winner or loser's core electoral support.

One of the key assumptions in this analysis is that the municipalities where the candidate barely wins resemble those where the candidate barely loses. Table 6 presents the difference in various characteristics of the municipalities where the LDP candidates win and where they lose. The top half of Table 6 simply examines the difference in the mean values of the characteristics between the municipalities where the LDP candidate won and where they lost. The differences in the means of the covariates appears larger when the full sample is used than when the sample is limited to close elections. This suggests that on average the municipalities in where the LDP candidate narrowly wins are more similar to the municipalities where the LDP candidate narrowly loses. The difference in district characteristics is lower when the election for the last seat is very close.

The bottom half of Table 6 presents the difference in means between the municipalities that are part of the core electoral support of the last place winner and first runner-up. District fixed effects are included in this comparison.[44] As Table 6 indicates, there is no statistically significant difference between these municipalities, and the magnitudes of the differences are relatively small.

Tables 7 presents the municipality level results for the 34th (1976), 36th (1980), 37th (1983), 38th (1986), and 39th (1990) Lower House elections.[45] The coefficients on the polynomials are not presented in the table. The results on the top half and bottom right of Table 7 are the municipality level results for the first year following the election. The results on the bottom left of the table are the municipality level results for the second year following the election using the 1% vote margin.

Both analyses of close elections show that the victory of an LDP incumbent affects the distribution of central government transfers to municipalities which are part of the incumbent's core electoral support in the first year following the election. The magnitude of the

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[44]The specification used to the difference is $y_{i_e m} = \alpha_{i_e} + X_{i_e m}\beta + \epsilon_{i_e m}$, where $y_{i_e m}$ is the district characteristic and $X_{i_e m}$ is an indicator for whether $i_e m$ is part of the core electoral support and W_{i_e} is whether an LDP candidate won in i_e.

[45]The 35th Lower House election is dropped since this took place in 1979 and less than 7 months later there was another election. The 40th (1993) election is dropped because of the political turmoil surrounding all the defections from the LDP around the election and the LDP's loss of control over the government following this election.

effect is larger if we focus on senior LDP incumbents or if we use a polynomial specification. The average effect of marginal LDP incumbents on their core support municipalities is an increase of about 12% to 17% in national treasury disbursements. The average effect for senior marginal LDP incumbents is approximately 17% to 25%. The magnitude of the effect of marginal LDP incumbents on transfers to their core electoral support municipalities is slightly smaller in magnitude to the effect for marginal deceased LDP incumbents.

The results on the bottom left of Table 7 suggest that difference in transfers between the core electoral support municipalities of the winning and losing LDP incumbents is not statistically significant by the second year following the election.[46] Both the magnitude and statistical significance of coefficient of interest declines in the second year. However, the difference in the coefficient of interest for the first and second year are not statistically significant. The lower point estimate may reflect the effort of the remaining LDP incumbents to attract the constituents of the LDP candidates who lost – or more likely that the local leaders who were attached to losing LDP candidates start making new political connections in order to secure government transfers. These results are consistent with the pattern of government transfers to low ranked LDP incumbents' core electoral support municipalities illustrated in Figure 4.

Two additional analyses that are not reported here provide further evidence for the robustness of the results in section 4. First, the district level analysis of close elections shows no statistically significant difference in the government transfers at the district level where the LDP wins the last seat and where LDP loses the last seat. Second, applying the close election framework to marginal opposition candidates' reveals that whether an opposition candidate wins an election or not has no impact on government transfers to the candidates' core electoral support areas. Both of these results are consistent with the results in section 4.

Post 1993 Electoral System

In theory, the close election design could be applied to close elections following the 1994 political reforms. In 1994, the electoral system for the Lower House changed to a mixed

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[46]The difference between the coefficient for the first year and the second year is not statistically significant.

system with two parts: a single member district (SMD) component and a proportional representation (PR) component. Voters were given two SNTVs – one for each component. Under this system, parties nominated only one candidate per SMD. Many speculate that this change reduced the incentives for candidates to provide constituency services, such as supplying central government-funded projects. The new system also reduced the incentive to target narrow sub-constituencies within their districts.

Table 8 presents the difference in government transfers to the localities of winning and losing LDP candidates in the 1996 and 2000 Lower House elections.[47] Since fewer candidates compete in each single member district as compared to the multi-member district system, the threshold for being part of the incumbent's core support is raised to 55 % of the vote.[48] Elections are assumed to be close where the difference in vote shares of the winners and losers are less than 5% or 2%.

LDP incumbents do not appear to provide more national treasury disbursements to their district overall or to the core constituents within their districts. There are a number of potential explanations for why the connection between LDP incumbents and government transfers disappeared. First, with the absence of intra-party competition and the addition of the PR component to the Lower House elections, the LDP as a party has less incentive to concentrate resources into narrow, geographically defined regions. Second, the post-1993 opposition parties may have better access to budgetary allocations than in the past since these parties are more centrist and contained former LDP representatives with experience influencing budgetary allocation. Finally, the poor economy and the poor fiscal situation of localities during this period may have also affected the distribution of government transfers. The connection between electoral institutions and government transfers deserves further empirical investigation.

6. Conclusion

Do individual Japanese representatives influence government transfers? The above anal-

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[47]Table A1 in the appendix presents the difference in key covariates between municipalities where the LDP candidate narrowly wins and loses. The differences, while not always statistically significant, are relatively large. Thus, the results in Table 8 could be due to random difference in the districts.

[48]The results are not sensitive to minor changes in the threshold.

ysis suggests that individual LDP representatives are not a free flowing "pipeline of pork" as characterized by the media, academics and politicians. There is no statistically significant evidence that representatives, even senior ones, affect the distribution of central government transfers across districts.

Electoral margins, rather than seniority, is the main characteristic determining which Diet representative affects year-to-year central government transfers in Japan. Only marginal representatives – the ones with the strongest incentives and perhaps the ones the LDP would like to help the most – appear to have some effect on government transfers. The finding that marginal LDP representatives focus government transfers on their electoral support bases is consistent with theoretical predictions by Cox and McCubbins and Myerson.

One interpretation of the results is that the LDP elite allocates national government funds to marginal incumbents in an effort to maintain the party's majority in the next election.[49] The additional evidence presented above suggests that this interpretation is not entirely correct. The analysis of deceased representatives shows that the allocation of transfers to marginal incumbents' core electoral support declines in the incumbent's absence which suggests that the representative had some influence over the transfers since the party should still have an incentive to allocate resources to these areas.[50] The result that the seniority of the marginal incumbent affects the distribution of transfers also suggests that incumbents' effort and/or ability affects the distribution of government transfers since party elites have an incentive to direct resources to all marginal incumbents, and not just the senior incumbents.[51]

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[49]This is consistent with the type of argument discussed in Dixit and Londregan (1996, 1998) and Lindbeck and Weibull (1987, 1993).

[50]Most deceased representatives are replaced in the next election by a relative or staff member who shares the deceased candidates' electoral support. Thus, we might expect that the party elite would still have an incentive to direct resources to the deceased marginal candidates' core electoral support since that will help the successor in the next election.

[51]Furthermore in an analysis not presented in this paper, there is little difference in the distribution of government transfers to "swing" districts versus "non-swing" districts. In "swing" districts the competition for the last seat is between an LDP candidate and a non-LDP candidate. In these districts LDP elite have an incentive to provide resources to marginal LDP incumbents and marginal incumbents have an incentive to exert effort to direct government transfers back to their district. In "non-swing" districts competition for the last seat is between two LDP candidates. In these districts LDP elite should be less concerned with losing the seat, but marginal incumbents should still have an incentive to exert effort to influence government transfers in both types of districts. The small difference in the distribution of government transfers to these two districts is consistent with the claim that the change in government transfers is a result of incumbent

We should note that we cannot rule out the possibility that politically powerful non-marginal politicians influence the allocation of public expenditures in ways other than through national treasury disbursements. For example, powerful electorally secure politicians may choose to help their core support municipalities receive funds for their localities through loans or by influencing the LAT formula. Influencing the LAT formula could insure that the municipality receives government transfers on a continual basis whether the incumbent is present or not.

We should also note that the results are specific to Japan during a particular period, 1977 to 1992. The institutions and political context of this period were particularly conducive to individual representatives exercising influence on government transfers. However, not finding strong evidence of widespread intervention by individual representatives even under conditions where we would expect it to be the most prevalent raises questions about how much individual politicians influence the distribution of public expenditures in other contexts.

effort rather than the strategies of political party elites.

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Figure 1. Geography of LDP Electoral Support in the Akita 2nd 1983 LH Election

LDP
Muraoka Kanezo

LDP
Sasayama Tatsuo

LDP
Nemoto Ryutaro
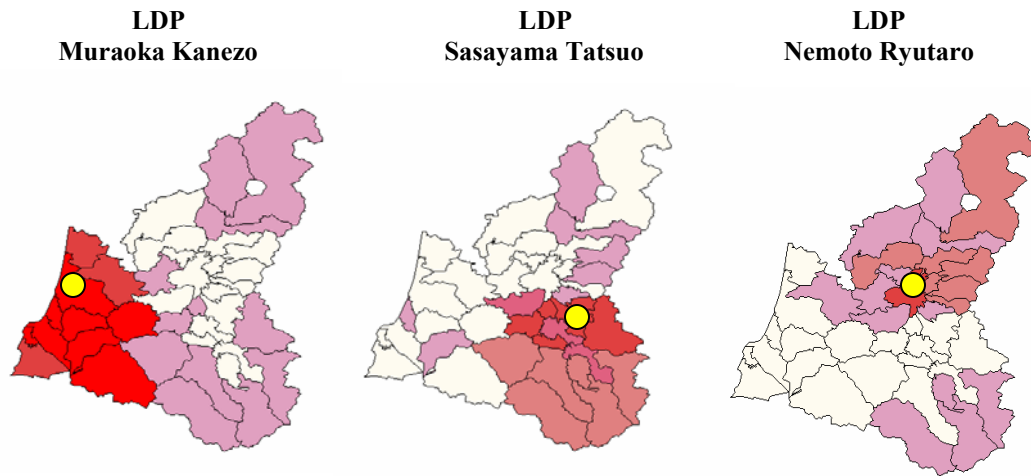
Figure 1a. Geography of JSP Electoral Support in the Akita 2nd 1983 LH Election

JSP
Kawamata Kenjiro

JSP
Hosoya Akio

Legend

0 to 5 percent
5 to 10 percent
10 to 15 percent
15 to 20 percent
20 to 25 percent
25 to 30 percent
30 to 35 percent
35 to 40 percent
40 to 45 percent
45 to 50 percent
50 to 55 percent
55 to 60 percent
60 to 65 percent
65 to 70 percent
70 to 75 percent
75 to 80 percent
80 to 85 percent
85 to 90 percent
90 to 95 percent
95 to 100 percent
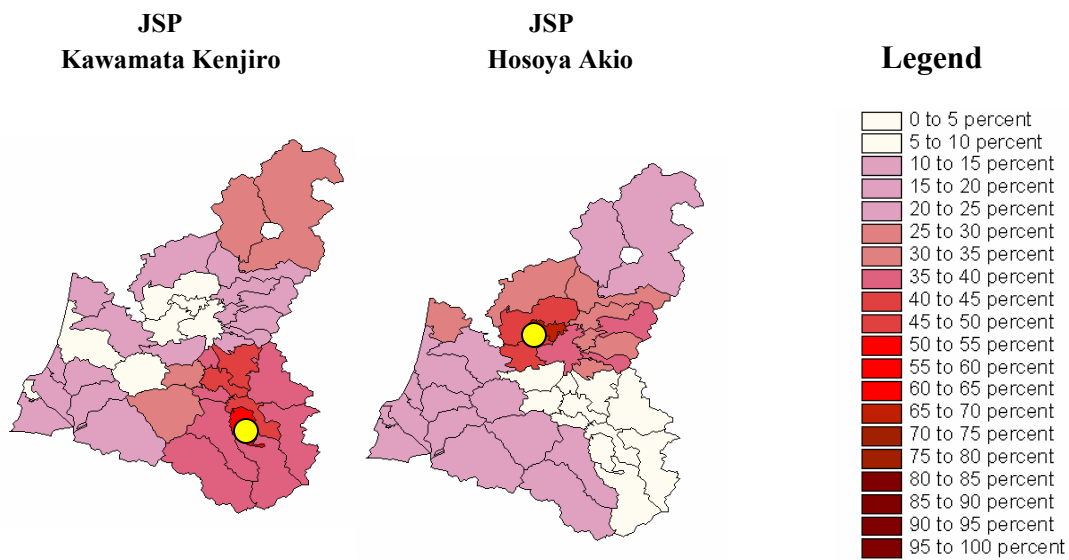
These figures illustrate the relationship between candidates' hometowns and electoral support when the hometowns are geographically separated. The yellow circles represent the candidates' hometowns. The black lines indicate municipality boundaries. The colors reflect the candidates' share of the municipality vote. The geographic divisions between LDP candidates are more clearly defined than the divisions between JSP and LDP candidates.

Figure 2. Number of Lower House Diet Members Who Pass Away by Year
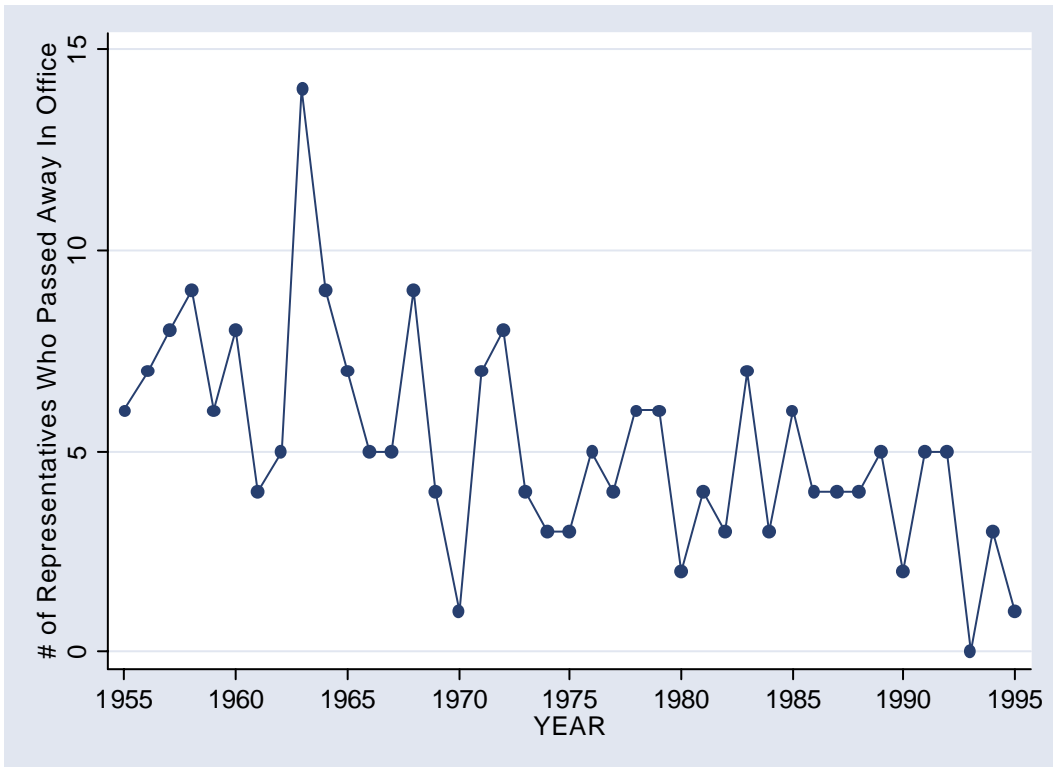
Figure 3. Age of Lower House Diet Members Who Pass Away Relative to Average Japanese Life Expectancy.
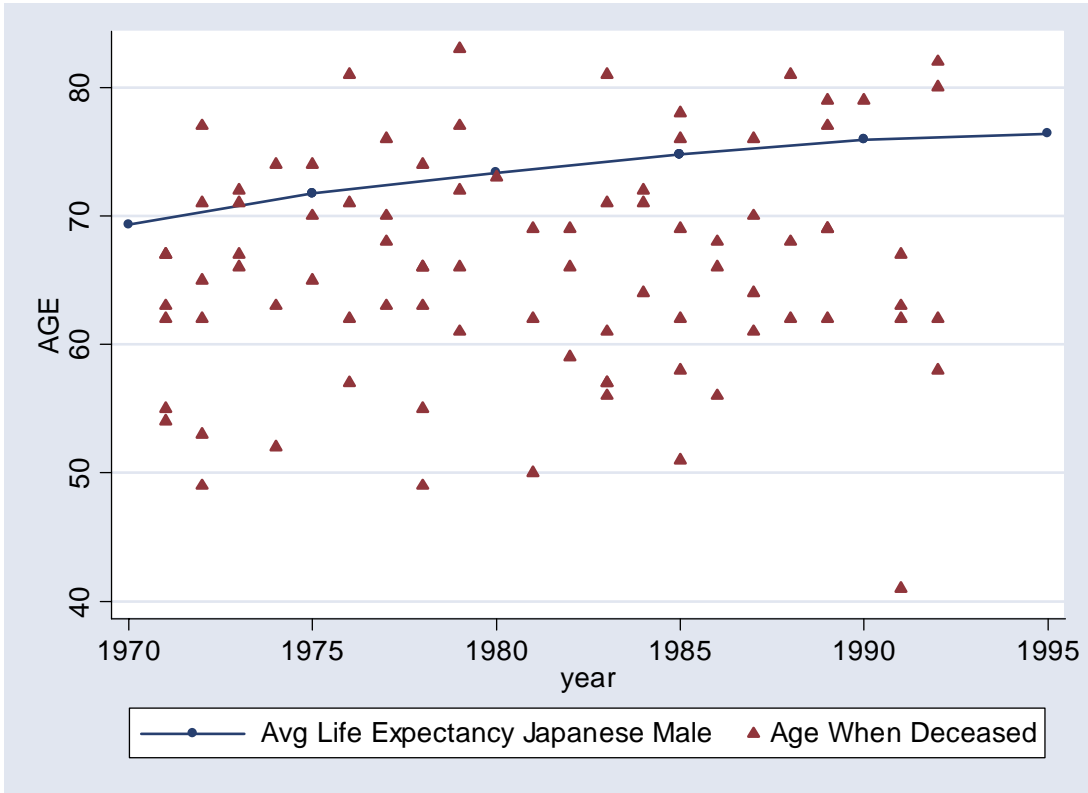
Figure 4. The Allocation of National Treasury Disbursements in the Years Surrounding the Passing Away of an LDP Incumbent
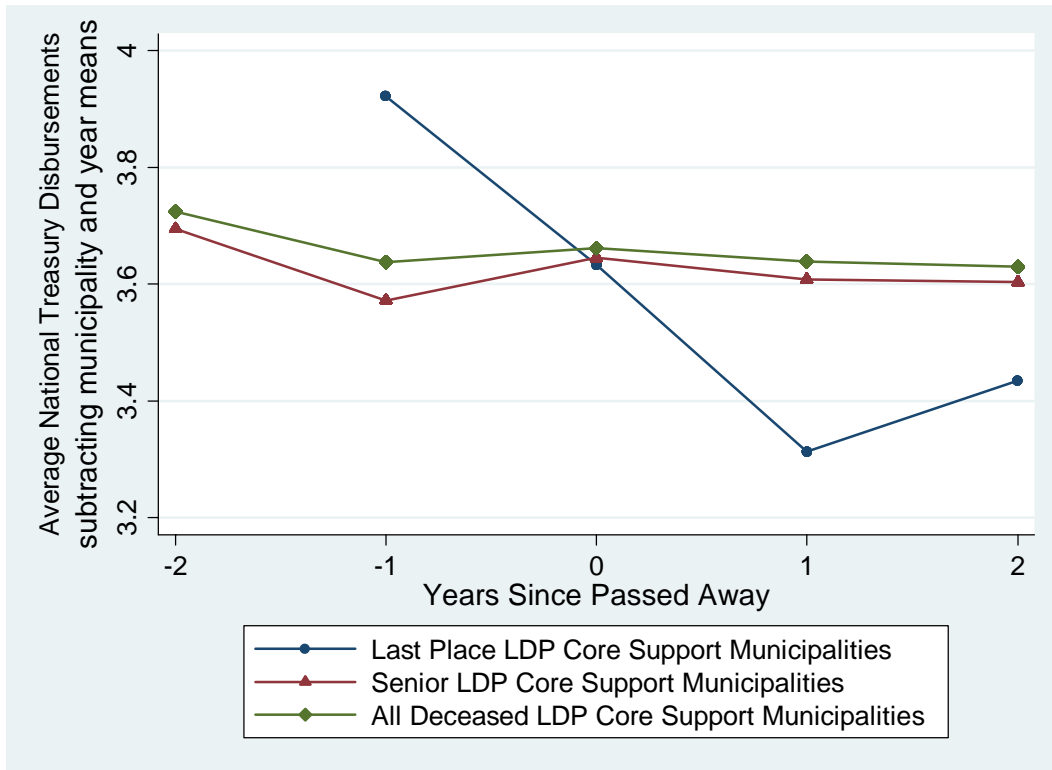
Table 1	
Causes of Death Among Japanese Lower House Legislators, 1970 to 1995	
Cause of Death	# Cases
Heart Failure/Attack	32
Cancer	18
Respiratory Problem/Pneumonia	13
Liver Problem	13
Brain Hemmorage/Embolism	5
Kidney Problem	5
Gastro-intestinal Problem	4
Suicide/Murder	3
Other	4

<table>
<thead>
<tr><th colspan="4">Table 2
Summary Statistics, 1977 to 1992</th></tr>
<tr><th></th><th>All</th><th>LDP
Died</th><th>Non-LDP
Died</th></tr>
</thead>
<tbody>
<tr><td colspan="4" align="center">District Level</td></tr>
<tr><td>ln p/c Central Government Transfers</td><td>-2.63</td><td>-2.55</td><td>-2.95</td></tr>
<tr><td></td><td>(0.82)</td><td>(0.84)</td><td>(0.56)</td></tr>
<tr><td>ln p/c National Treasury Disbursement</td><td>-3.62</td><td>-3.50</td><td>-3.76</td></tr>
<tr><td></td><td>(0.42)</td><td>(0.44)</td><td>(0.34)</td></tr>
<tr><td>ln p/c Prefectural Treasury Disbursements</td><td>-4.30</td><td>-4.14</td><td>-4.43</td></tr>
<tr><td></td><td>(0.51)</td><td>(0.48)</td><td>(0.34)</td></tr>
<tr><td>ln (1st Tier Workers/Workers)</td><td>-2.58</td><td>-2.13</td><td>-2.32</td></tr>
<tr><td></td><td>(1.34)</td><td>(0.79)</td><td>(0.50)</td></tr>
<tr><td>ln (Dep Pop / Pop)</td><td>-1.13</td><td>-1.11</td><td>-1.12</td></tr>
<tr><td></td><td>(0.09)</td><td>(0.07)</td><td>(0.04)</td></tr>
<tr><td>ln p/c Income</td><td>-0.15</td><td>-0.21</td><td>-0.11</td></tr>
<tr><td></td><td>(0.32)</td><td>(0.29)</td><td>(0.17)</td></tr>
<tr><td>ln Population</td><td>13.61</td><td>13.54</td><td>13.68</td></tr>
<tr><td></td><td>(0.44)</td><td>(0.36)</td><td>(0.35)</td></tr>
<tr><td>Observations</td><td>1760</td><td>61</td><td>29</td></tr>
<tr><td colspan="4" align="center">Municipality Level</td></tr>
<tr><td>ln p/c Central Government Transfers</td><td>-2.10</td><td>-1.98</td><td>-2.13</td></tr>
<tr><td></td><td>(0.80)</td><td>(0.88)</td><td>(0.74)</td></tr>
<tr><td>ln p/c National Treasury Disbursements</td><td>-3.65</td><td>-3.57</td><td>-3.66</td></tr>
<tr><td></td><td>(0.72)</td><td>(0.71)</td><td>(0.65)</td></tr>
<tr><td>ln p/c Prefectural Treasury Disbursements</td><td>-3.71</td><td>-3.54</td><td>-3.62</td></tr>
<tr><td></td><td>(0.89)</td><td>(0.88)</td><td>(0.89)</td></tr>
<tr><td>ln (1st Tier Workers/Workers)</td><td>-1.77</td><td>-1.69</td><td>-1.62</td></tr>
<tr><td></td><td>(1.02)</td><td>(0.80)</td><td>(0.80)</td></tr>
<tr><td>ln (Dep Pop / Pop)</td><td>-1.05</td><td>-1.05</td><td>-1.05</td></tr>
<tr><td></td><td>(0.09)</td><td>(0.10)</td><td>(0.08)</td></tr>
<tr><td>ln p/c Income</td><td>-0.39</td><td>-0.38</td><td>-0.38</td></tr>
<tr><td></td><td>(0.36)</td><td>(0.31)</td><td>(0.28)</td></tr>
<tr><td>ln Population</td><td>9.46</td><td>9.28</td><td>9.49</td></tr>
<tr><td></td><td>(1.21)</td><td>(1.15)</td><td>(1.15)</td></tr>
<tr><td>Observations</td><td>49895</td><td>1198</td><td>397</td></tr>
</tbody>
</table>

	Central Government Transfers		National Treasury Disbursements		Prefectural Treasury Disbursements	
	(1)	(2)	(3)	(4)	(5)	(6)
Died LDP	-0.06 (0.05)	-0.06 (0.07)	-0.04 (0.06)	-0.05 (0.08)	0.02 (0.08)	-0.01 (0.10)
Died non LDP	-0.02 (0.07)	-0.05 (0.14)	0.02 (0.10)	-0.06 (0.16)	-0.21 (0.14)	-0.29 (0.21)
Senior LDP Died		0.04 (0.07)		0.00 (0.03)		0.04 (0.11)
Senior non-LDP Died		-0.03 (0.08)		0.02 (0.03)		0.14 (0.16)
Marginal LDP Died		-0.10 (0.15)		0.01 (0.04)		-0.08 (0.15)
Marginal non-LDP Died		0.10 (0.11)		0.03 (0.05)		0.03 (0.25)
ln (1st Tier Workers/Workers)	0.32* (0.11)	0.32* (0.11)	0.12 (0.16)	0.12 (0.16)	-0.12 (0.15)	-0.12 (0.15)
ln (Dep Pop / Pop)	2.71* (0.42)	2.72* (0.42)	0.96* (0.40)	0.95* (0.40)	0.27 (0.39)	0.27 (0.39)
ln p/c Income	0.09 (0.32)	0.10 (0.32)	0.02 (0.24)	0.03 (0.24)	0.56 (0.28)	0.56* (0.28)
Observations	1760					

Table 3
Government Transfers to Municipality Governments
Aggregate by District, 1977 to 1992

District*legislature fixed-effects and year fixed-effects are included in all regressions. * indicates statistical significance at the 5% level. *LDP Died, non-LDP Died, Senior LDP Died, Senior non-LDP Died, Marginal LDP Died*, and *Marginal non-LDP Died* are all divided by the number seats in the district.

	Central Government Transfers		National Treasury Disbursements		Prefectural Treasury Disbursements	
Table 4 Transfers to Municipality Governments 1977 to 1992						
	(1)	(2)	(3)	(4)	(5)	(6)
LDP Died	-0.06 (0.05)	0.00 (0.07)	-0.04 (0.10)	0.02 (0.16)	0.03 (0.08)	0.07 (0.11)
LDP Died Core	-0.00 (0.02)	-0.01 (0.02)	-0.05 (0.05)	-0.03 (0.08)	0.03 (0.04)	0.01 (0.06)
Non LDP Died	-0.05 (0.04)	-0.05 (0.04)	-0.02 (0.11)	-0.02 (0.11)	-0.18 (0.12)	-0.18 (0.12)
Non LDP Died Core	-0.01 (0.02)	-0.01 (0.02)	-0.14 (0.15)	-0.14 (0.15)	0.17 (0.14)	0.17 (0.14)
Senior LDP Died		-0.05 (0.08)		-0.09 (0.19)		-0.01 (0.15)
Senior LDP Died Core		0.00 (0.03)		0.01 (0.10)		0.03 (0.08)
Marginal LDP Died		-0.11 (0.14)		-0.00 (0.22)		-0.13 (0.15)
Marginal LDP Died Core		-0.07 (0.06)		-0.35* (0.07)		-0.02 (0.15)
ln (1st Tier Workers/Workers)	0.25* (0.05)	0.25* (0.05)	0.13 (0.10)	0.13 (0.10)	0.13 (0.08)	0.14 (0.08)
ln (Dep Pop / Pop)	1.56* (0.15)	1.56* (0.15)	1.03 (0.31)	1.03 (0.31)	0.08 (0.20)	0.08 (0.20)
ln p/c Income	-0.09* (0.02)	-0.09* (0.02)	0.02 (0.07)	0.01 (0.07)	0.04 (0.05)	0.04 (0.05)
Observations	49895					

Municipality*legislative session fixed-effects and year fixed-effects are included in all regressions. Standard errors are clustered by district*legislative session. * indicates statistical significance at the 5% level. *LDP Died, non-LDP Died, Senior LDP Died*, and *Marginal LDP Died* are all divided by the number seats in the district.

Table 5
Transfers to Deceased Marginal LDP Incumbents' Core Areas
1977 to 1992

	Threshold for Determining Core Area				
	20%	25%	30%	35%	25-30-35
ln(Per Capita National Treasury Disbursements)					
Marginal LDP Died Core	-0.15*	-0.22*	-0.38*	-0.33*	-0.16*
	(0.04)	(0.06)	(0.09)	(0.14)	(0.05)
ln (1st Tier Workers/Workers)	0.13	0.13	0.13	0.13	0.13
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
ln (Dep Pop / Pop)	1.04*	1.03*	1.03*	1.03*	1.04*
	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)
ln p/c Income	0.02	0.01	0.01	0.02	0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Per Capita National Treasury Disbursements					
Marginal LDP Died Core	-0.01*	-0.02*	-0.03*	-0.01*	-0.01*
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
1st Tier Workers/Workers	-0.08	-0.08	-0.08	-0.08	-0.08
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Dep Pop / Pop	0.02	0.02	0.02	0.02	0.02
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
p/c Income	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	49895				

Municipality*legislative session fixed-effects and year fixed-effects are included in all regressions. Standard errors are clustered at the district*legislative session. * indicates statistical significance at the 5% level. 25-30-35 refers to 25% for 5 member district, 30% for four member district, and 35% for three member district.

<table>
<thead>
<tr>
<th colspan="7">Table 6
Difference in Municipality Characteristics Between Districts Where
LDP Candidates Win and Lose Under the MMD System, 1977 to 1992</th>
</tr>
<tr>
<th colspan="7">All Municipalities</th>
</tr>
<tr>
<th></th>
<th colspan="3">Year 1</th>
<th colspan="3">Year 2</th>
</tr>
<tr>
<th></th>
<th>All</th>
<th>2%</th>
<th>1%</th>
<th>All</th>
<th>2%</th>
<th>1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln p/c National Treasury Disbursements</td>
<td>-0.05
(0.04)</td>
<td>-0.10
(0.06)</td>
<td>-0.07
(0.07)</td>
<td>-0.02
(0.04)</td>
<td>-0.09
(0.06)</td>
<td>-0.05
(0.08)</td>
</tr>
<tr>
<td>ln (Dep Pop / Pop)</td>
<td>0.01
(0.01)</td>
<td>0.00
(0.01)</td>
<td>0.00
(0.01)</td>
<td>0.01
(0.01)</td>
<td>0.00
(0.01)</td>
<td>-0.00
(0.00)</td>
</tr>
<tr>
<td>ln (1st Tier Workers/Workers)</td>
<td>0.17*
(0.05)</td>
<td>0.01
(0.07)</td>
<td>0.04
(0.09)</td>
<td>0.18*
(0.05)</td>
<td>-0.01
(0.07)</td>
<td>0.04
(0.08)</td>
</tr>
<tr>
<td>ln p/c Income</td>
<td>-0.05
(0.03)</td>
<td>0.02
(0.04)</td>
<td>-0.01
(0.05)</td>
<td>-0.05
(0.03)</td>
<td>0.02
(0.04)</td>
<td>-0.01
(0.05)</td>
</tr>
<tr>
<td>ln Population</td>
<td>-0.06
(0.04)</td>
<td>0.01
(0.06)</td>
<td>0.01
(0.07)</td>
<td>-0.06
(0.04)</td>
<td>0.01
(0.06)</td>
<td>0.01
(0.07)</td>
</tr>
<tr>
<td colspan="7">Core Electoral Support Municipalities Including District-Year Fixed Effects</td>
</tr>
<tr>
<td>ln p/c National Treasury Disbursements</td>
<td>0.11*
(0.04)</td>
<td>0.13*
(0.05)</td>
<td>0.19*
(0.06)</td>
<td>0.07
(0.04)</td>
<td>0.07
(0.06)</td>
<td>0.14*
(0.07)</td>
</tr>
<tr>
<td>ln(Dep Pop / Pop)</td>
<td>0.01
(0.01)</td>
<td>0.00
(0.01)</td>
<td>-0.00
(0.01)</td>
<td>0.01
(0.01)</td>
<td>0.00
(0.01)</td>
<td>-0.00
(0.01)</td>
</tr>
<tr>
<td>ln (1st Tier Workers/Workers)</td>
<td>0.03
(0.06)</td>
<td>0.02
(0.08)</td>
<td>0.04
(0.11)</td>
<td>0.03
(0.06)</td>
<td>0.02
(0.08)</td>
<td>0.05
(0.11)</td>
</tr>
<tr>
<td>ln p/c Income</td>
<td>-0.01
(0.02)</td>
<td>-0.01
(0.02)</td>
<td>-0.01
(0.03)</td>
<td>-0.00
(0.02)</td>
<td>-0.01
(0.02)</td>
<td>-0.01
(0.03)</td>
</tr>
<tr>
<td>ln Population</td>
<td>-0.00
(0.08)</td>
<td>0.03
(0.09)</td>
<td>0.01
(0.12)</td>
<td>-0.00
(0.08)</td>
<td>0.03
(0.09)</td>
<td>0.00
(0.12)</td>
</tr>
<tr>
<td>Obs</td>
<td>16837</td>
<td>8073</td>
<td>5137</td>
<td>16837</td>
<td>8073</td>
<td>5137</td>
</tr>
<tr>
<td># LDP / (# Seats + 1)</td>
<td>0.10*
(0.02)</td>
<td>0.02
(0.02)</td>
<td>0.01
(0.03)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District Magnitude</td>
<td>-0.11
(0.07)</td>
<td>-0.03
(0.10)</td>
<td>0.07
(0.12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obs</td>
<td>598</td>
<td>269</td>
<td>171</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* indicates statistical significance at the 5% level. Standard errors are clustered by district-legislative session.

<table>
<thead>
<tr><th colspan="2"></th><th colspan="6">Municipality First Year</th></tr>
</thead>
</table>

Table 7
Close Elections and National Treasury Disbursements
to Municipalities Under MMD/SNTV, 1977 - 1992

| | Municipality First Year | | | | | |
| | All | | Junior 3≤ Terms | | Senior 4≥ Terms | |
	2%	1%	2%	1%	2%	1%
LDP Core	-0.04	-0.07	-0.07	-0.09	-0.01	-0.06
	(0.03)	(0.04)	(0.05)	(0.06)	(0.05)	(0.06)
LDP Core Win	0.13*	0.19*	0.02	0.09	0.19*	0.25*
	(0.05)	(0.06)	(0.08)	(0.08)	(0.07)	(0.09)
ln (Dep Pop / Pop)	1.45*	1.37*	1.58*	1.39*	1.33*	1.34*
	(0.24)	(0.30)	(0.37)	(0.49)	(0.32)	(0.37)
ln (1st Tier Workers/Workers)	-0.09*	-0.10*	-0.08*	-0.10*	-0.09*	-0.09
	(0.02)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
ln p/c Income	-0.23	-0.24*	-0.20	-0.20	-0.24*	-0.29
	(0.07)	(0.09)	(0.11)	(0.13)	(0.08)	(0.10)
Observations	8073	5137	3867	2404	4206	2733
Districts	269	171	132	84	137	87
	2nd Year (1%)			Polynomial 1st yr		
	All	Junior	Senior	All	Junior	Senior
LDP Core	-0.03	-0.06	-0.00			
	(0.04)	(0.07)	(0.05)			
LDP Core Win	0.14*	0.10	0.15	0.17*	0.06	0.29*
	(0.07)	(0.09)	(0.09)	(0.06)	(0.09)	(0.08)
ln (Dep Pop / Pop)	1.17*	0.94*	1.34*	1.46*	1.68*	1.21*
	(0.29)	(0.43)	(0.40)	(0.37)	(0.42)	(0.56)
ln (1st Tier Workers/Workers)	-0.08*	-0.07*	-0.08*	-0.05	-0.05	-0.05
	(0.02)	(0.03)	(0.03)	(0.04)	(0.05)	(0.05)
ln Per Capita Income	-0.23*	-0.21	-0.24*	-0.20	-0.25	-0.13
	(0.09)	(0.15)	(0.10)	(0.10)	(0.17)	(0.13)
Observations	5137	2404	2733	1735	792	943
Districts	171	84	87	328	153	175

District fixed-effects are included in the non-polynomial regressions. Fixed effects for legislative session are included in the polynomial regressions. * indicates statistical significance at the 5% level.

<table>
<tr><td colspan="5">Table 8
Close Elections and National Treasury Disbursements
to Municipalities Under SMD/SNTV/PR, 1997 - 2002</td></tr>
<tr><td></td><td>All
5%</td><td>All
2%</td><td>Junior
5%</td><td>Senior
5%</td></tr>
<tr><td>LDP Core</td><td>0.16
(0.10)</td><td>0.07
(0.18)</td><td>0.12
(0.12)</td><td>0.19
(0.16)</td></tr>
<tr><td>LDP Core Win</td><td>-0.14
(0.13)</td><td>-0.07
(0.19)</td><td>-0.12
(0.16)</td><td>-0.11
(0.19)</td></tr>
<tr><td>ln (1st Tier Workers/Workers)</td><td>-0.07
(0.05)</td><td>-0.13
(0.06)</td><td>-0.06
(0.06)</td><td>-0.13
(0.06)</td></tr>
<tr><td>ln (Dep Pop / Pop)</td><td>1.56*
(0.39)</td><td>1.98*
(0.52)</td><td>1.32*
(0.45)</td><td>2.47*
(0.42)</td></tr>
<tr><td>ln p/c Income</td><td>-0.18
(0.30)</td><td>-0.25
(0.38)</td><td>-0.18
(0.36)</td><td>-0.07
(0.38)</td></tr>
<tr><td>Observations</td><td>1271</td><td>584</td><td>958</td><td>313</td></tr>
<tr><td>Districts</td><td>120</td><td>56</td><td>94</td><td>26</td></tr>
</table>

District-legislative session fixed-effects are included. * indicates statistical significance at the 5% level. Standard errors are clustered by district-legislative session.

Table A1
Difference Between Municipality Characteristics in Districts
Where LDP Candidates Win and Lose under SMD/SNTV/PR
1997 and 2001

All Municipalities			
	All 1st year		
	All	5%	2%
ln p/c National Treasury Disbursements	-0.03	0.01	-0.03
	(0.07)	(0.12)	(0.20)
ln (1st Tier Workers/Workers)	-0.09	0.17	0.62*
	(0.09)	(0.18)	(0.22)
ln (Dependent Pop / Pop)	0.02	0.01	0.07
	(0.01)	(0.02)	(0.04)
ln Per Capita Income	-0.00	0.01	-0.11
	(0.03)	(0.04)	(0.06)
Observations	6547	1185	543
Core Electoral Support Municipalities Including District-Year Fixed Effects			
ln p/c National Treasury Disbursements	-0.04	-0.25	-0.15
	(0.10)	(0.17)	(0.28)
ln (1st Tier Workers/Workers)	0.07	0.10	-0.46
	(0.10)	(0.17)	(0.23)
ln (Dependent Pop / Pop)	0.02	-0.03	-0.05
	(0.02)	(0.03)	(0.04)
ln p/c Income	0.03	0.04	0.01
	(0.02)	(0.04)	(0.05)
Observations	6547	1185	543
Districts	503	116	55

* indicates statistical significance at the 5% level. Standard errors are clustered by district-legislative session.