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RESEARCH ARTICLE

Dyadic representation in parliamentary democracy in Japan[*]

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Abstract

This study evaluates dyadic representation, that is, the link between the policy preferences of the constituencies and their representatives in the Japanese Lower House (LH). More specifically, this study examines how the within-party variation in policy positions among party candidates corresponds with that across their districts. By examining a series of candidate surveys conducted between 2003 and 2012 as well as the local employment structure, this study maps the association between the policy preferences of constituencies and those of their district candidates for two major parties. Specifically, candidates were found to take more rural-oriented positions on economic policies when running in districts with rural employment structures, while there remained a clear difference between parties. Moreover, this study demonstrates that constituencies accord more votes to candidates who better represent their preferences, strengthening the link by electing those who fulfill the responsibility beyond their party label.

Key words: Dyadic representation; electoral campaign; voting behavior

1. Introduction

This study focuses on *dyadic representation*, that is, the link between the policy preferences of the constituencies and their representatives (Weissberg, 1978) in the Japanese Lower House (LH). It examines how the *within-party* variation in policy positions among party candidates corresponds to the variations in policy positions across their districts. Some degree of dyadic representation is achieved if the elections under the single-member district (SMD) electoral system are contested by responsible, cohesive, and programmatic national parties (Hanretty *et al.*, 2017). Each constituency chooses candidates based on their parties' national policy platform, depending on which party's platform best reflects their policy preferences. However, the association becomes more prominent if party candidates individually hold policy positions that are better suited to the districts within their parties.

Several studies have investigated the dyadic representation, mainly concerning the United States (US) Congress (Miller and Stokes, 1963; Bartels, 1991; Bishin, 2000; Gerber and Lewis, 2004; Ansolabehere and Jones, 2010; Bafumi and Herron, 2010; Krimmel *et al.*, 2016). However, only a few studies have examined systems of representation in other countries (Converse and Pierce, 1986, for France; Hanretty *et al.*, 2017, for the United Kingdom (UK); Lee *et al.*, 2018, for Korea; Russo, 2011, for Italy).

This skewed focus is partly due to data availability. Most studies conducted in the USA use roll-call votes to estimate the policy preferences of individual representatives. This approach is not useful for

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most other countries because they cast votes that mostly toe the party line. Moreover, representatives outside the USA are often normatively expected to be cohesive and loyal to their party platform by collectively representing the interest of their national support base (e.g., national labor union), not necessarily each local constituency. Hence, for these countries, scholars instead examine ideological congruence – the proximity of policy preference between the legislature and the citizens at the national level, not at the district/individual representatives' level (Huber and Powell, 1994; Powell, 2000, 2009; McDonald *et al.*, 2004; Golder and Stramski, 2010).

Nevertheless, to what extent candidates' policy positions are diverse within their parties and how this variation is associated with their constituencies are important empirical questions. This study analyzes this problem using a series of candidate surveys in Japan and the district employment structure as a proxy for the constituent policy preference. The candidate surveys are unique in measuring the policy positions not only of incumbent legislative members but also of new challengers without any experience in the legislature. This study reveals a clear association between candidates' policy positions and their districts in Japanese LH. This paper also shows a substantial partisan difference in a policy position between party candidates, suggesting that they represent a subset of the constituencies consistent with their national support base.

This study demonstrates that constituencies provide additional votes to candidates that are representative of their districts. This paper shows that the difference in the economic policy position between two major-party candidates competing in the same district affects their electoral outcome, in addition to the effect changes between rural and urban districts. Until recently, only a few studies, including those focused on the USA, have examined whether constituent reward candidates hold preferable policy positions (Ansolabehere and Jones, 2010). Crucially, roll-call votes, often used to estimate incumbent legislators' policy positions, cannot measure the relative attractiveness of new challengers without a legislative record. Recent studies have started examining this relationship by utilizing a novel approach and/or data to estimate the candidate policy position (e.g., their campaign donors, Hall, 2015). This study presents an additional case of this sort of inquiry.

The remainder of this paper is organized as follows. Section 2 introduces the relevant empirical background: the Japanese LH electoral system, the two major parties competing in the majoritarian tier of the LH, and the political issues examined in the analysis. Section 3 explains the approach used to examine dyadic representation in Japan by describing the data and methods used to measure the candidates' and constituencies' policy positions. Section 4 proposes the hypotheses and statistical models used to test this hypothesis. Section 5 presents the results of the statistical analysis and figures of dyadic representation in Japan. Section 6 summarizes the conclusions of the study and discusses its implications for future research.

2. Empirical background

The Japanese Parliament has two chambers: the lower house (LH) and the upper house (UH). The LH, which constitutes the focus of this study, holds more power regarding a few important issues. These include electing the prime minister and deliberating budget bills. The term of an LH representative may last up to 4 years, but the prime minister can dissolve the chamber anytime to call for a snap election. The LH uses a mixed-member majoritarian electoral system. The electoral system combines two electoral tiers: single-member majoritarian and proportional representation (PR). Currently, the LH electoral system elects 289 members from the majoritarian tier with SMDs and 176 members from the closed-list PR tier with 11 regional districts.[1]

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[1]The electoral system allows dual listing: political parties can nominate the same candidates both in majoritarian and PR tiers. If a candidate then wins in his/her majoritarian district, he/she is deleted from the PR list. Moreover, parties can list these dual candidates at an equal rank on the PR list. Among the candidates listed at the same rank, priority is given to those who lost with the largest vote-share ratio to the winning candidates in their districts. In recent years, most major party candidates are dual listed at an equal rank (usually at first or second rank) to provide party PR seats to the 'best' losers, i.e., those candidates who lost by the narrowest margin. Despite dual listing procedures, party candidates generally run

Between 1998 and 2016, there were two major parties in the Japanese party system, the Liberal Democratic Party (LDP) and the Democratic Party of Japan (DPJ), as well as a few smaller parties. In most of the SMDs of the LH, only candidates from the two major parties had a serious chance of obtaining electoral victories. There were substantial electoral swings between the two parties, especially in the LH general elections during 2005, 2009, and 2012.[2,3]

The LDP is a conservative party with its support base consisting mainly in rural areas and has been predominant in Japanese politics since its formation in 1955. During its history, the LDP has fallen out of power only twice, each time for a relatively short period (1993–1994 and 2009–2012).

The DPJ was formed in 1998 as a center-left party. The party became a serious contender for the LDP during the 2000s, primarily by gaining seats in urban and industrial areas. The DPJ took power in 2009 by achieving a sound victory over the LDP. However, the DPJ soon lost its popularity owing to problems with mismanagement (Kushida and Lipscy, 2013). The LDP returned to power in 2012, with a sweeping victory. The DPJ barely maintained its status as the second-largest party in the LH due to this defeat. The DPJ broke up before and after the election. The LDP-led coalition has continued to win elections in the LH and UH until the present (December 2021).

Historically, candidates in Japan ran candidate-centered electoral campaigns. This was especially the case when the LH used a multi-member majoritarian electoral system with single non-transferable voting (MMD/SNTV) before 1994 (Curtis, 1971; Carey and Shugart, 1995; Hirano, 2006; Scheiner, 2006).

Under the MMD/SNTV system, the governing LDP fielded more than one candidate in each district to achieve a majority. These candidates had to compete not only with the other party candidates but also with their co-partisans; therefore, they established *koenkai*, a private campaign organization, to mobilize voters in the districts beyond their party platform. Although the LH electoral reform in 1994 was designed to ensure a more party- and (national) policy-oriented campaign, the candidates kept using koenkai to mobilize support in their districts. The candidates usually start organizing their koenkai with their local friends and acquaintances as a core group of supporters. They then expand it based on neighborhood associations, local alumni associations, firms and business associations (especially for LDP candidates), or labor unions (especially for DPJ candidates). Their electoral campaign relying upon these organizations should be well-tailored to district-specific interests, not only to their national party platform, which would enhance the link between the policy preferences of the constituencies and their representatives. The members of koenkai are comparable to personal and primary constituencies, which Fenno (1978) discusses the US House members' perception of their constituency.

There has been debate regarding the nature of electoral campaigns in Japan after the 1994 electoral reform. Initially, scholars argue that constituents in Japan continue to favor candidates who serve their local districts' interests, much as they did before the reform (McKean and Scheiner, 2000; Bawn and Thies, 2003). In recent years, many argue that voters have switched to caring more about national issues such as national security, while parties and candidates run campaigns based on these programmatic appeals (Kabashima and Steel, 2010; Reed *et al.*, 2012; Catalinac, 2016a).

Suppose the candidates were to run an individual candidate-centered campaign. Could they influence the policy process to fulfill their promises, such as policies tailored to their districts? Japan has a

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campaigns and behave as representatives for majoritarian districts, even if they won their seats from the PR tier because their vote-share in those districts primarily decides their fate.

[2]The number of majoritarian districts that the LDP won sharply fluctuated: 219 in 2005, 64 in 2009, and 237 in 2012 (out of 300). Those of the DPJ also swung between 52 in 2005, 221 in 2009, and 27 in 2012.

[3]This paper focuses on two major parties and does not include candidates nominated by small parties for the following reasons. First, they have small chance to win at single-member districts and consequently weaker incentive to adjust themselves to the median voter of their districts. Instead, they run as a loyal face of the party in the districts to promote their party manifesto, and thus, aim to mobilize additional votes in the proportional representation tier as the contamination-effect literature argues (Cox and Schoppa, 2002; Ferrara et al., 2005). Moreover, a significant fraction of the small party candidates in single-member districts are those of the Japanese Communist Party, which conducts the most party-oriented electoral campaign in Japan. In other words, their candidates are less likely to shift their policy position to their districts. The existing literature shows little variation in the policy position of the JCP candidates (e.g., Taniguchi, 2020: 67).

parliamentary system with solid legislative discipline; however, conventional wisdom (and many scholarly publications) indicates that backbenchers still have an apparent influence on the policymaking process (Krauss and Pekkanen, 2010; Oyama, 2011). For example, the Members of Parliament (MPs) for the LDP participate in a few divisions of the Policy Affairs Research Council (PARC). This intra-party institution discusses government policy proposals before officially submitting them to the legislature as bills. The divisions correspond to each policy area, such as foreign affairs, education, and agriculture. The MPs can affiliate with any of the divisions based on their own or their constituencies' interests. At these divisions, they exert their influence on legislation and appropriation.[4] The DPJ has a similar intra-party institution to the PARC, although the policy influence of their backbenchers could be smaller than that of the LDP (Hamamoto, 2015). The constituents in Japan can expect to influence policy by electing candidates who have policy preferences close to their own, not solely by choosing the party with the most preferable national platform. Even if MPs cannot single-handedly alter the policy of their party, voters should be expected to want a representative that will advocate for them, which provides an incentive for candidates to accommodate (or a least to pay lip service) to their district preference.

This study examines the candidates' policy positions regarding rural–urban economic issues, such as public spending on employment, highway construction, or trade protection of agricultural products. These economic issues are convenient tools that can be used to examine dyadic representation in Japan. First, these issues have been visible and salient in Japanese politics, contributing to a more robust link between constituency and candidate preferences (Miller and Stokes, 1963; Kuklinski and Elling, 1977). The urban–rural divide is one of the most salient cleavages in Japanese politics (Shimizu, 2013). These economic issues have probably been the second most frequently raised issue for public discussion, only after foreign affairs/defense issues (Taniguchi, 2006). In addition to supporting fiscal transfers to rural areas or trade protection for agricultural products, LDP politicians advocate expansionary government spending, especially in public construction projects to create jobs in rural areas, while the opposition criticizes these strategies. These policies are arguably a compensation for rural sectors who would lose by trade liberalization, which the government has been promoting for collective goods (Naoi, 2015).

Although it seems paradoxical, the conservative LDP prefers more public expenditure, while in contrast, the liberal and urban-oriented DPJ supports less spending in this field. These issues should be relatively easy for regular voters to understand to evaluate their candidates in Japan, strengthening the policy link between representatives and those represented (Hurley and Hill, 2003).

These economic issues constitute lines of political disputes *along with* geographical boundaries, while most other political conflicts in Japan (such as those concerning foreign policy or inter-class redistribution) *go across* these boundaries. Because the majoritarian electoral system draws district boundaries geographically, some districts contain metropolitan areas, while others cover predominantly rural areas, which yields considerable variation in policy preferences across the districts regarding the urban–rural issue.

Given the tradition of a candidate-centered campaign, in addition to the saliency of the urban–rural economic issue in Japan, it is very likely to observe within-party variation regarding this issue, at least to some extent.[5] Furthermore, the development of the two-party system with a national campaign platform and their partisan discipline in the legislative process implies a clear partisan gap in policy preferences regarding the issue.

3. Data and methodology

To measure the positions of the candidates, this study used a candidate survey from the University of Tokyo and the Asahi Newspaper Survey (UTAS).[6] The UTAS has been conducted in every national

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[4]In contrast, Hirano (2011) casts doubt on the policy influence of individual representatives for public expenditure by using a quasi-experimental approach.

[5]Some studies in Japan suggest a link (Taniguchi, 2006, 2020; Tatebayashi, 2014).

[6]The Asahi Newspaper is one of the major national newspapers in Japan, which had a readership of almost six million in 2018 (Asahi Newspaper, 2019).

election since 2003, covering seven LH general elections and six UH regular elections, both for candidates and voters. This study examined candidate surveys at the LH general elections between 2003 and 2012 (2003, 2005, 2009, and 2012) and excluded those taken in 2014 and 2017. Before these elections, there was significant redistricting,[7] which made it difficult to discuss the links between the districts and their candidates' preferences. The survey data in 2021 are not open to the public yet.

The response rate to the UTAS was very high among candidates – more than 93% of the candidates who participated in the surveys used for this paper, and this percentage was even higher among major party candidates. This could be partly because the Asahi newspaper writes articles based on responses seen during the campaign, both at the national and the local/candidate level. The UTAS is widely used by many scholars studying Japanese politics to decipher candidate policy preferences (Ito, 2015; Miwa, 2015; Kubo, 2016; Smith and Tsutsumi, 2016; Hamzawi, 2021).[8]

From various questions asked in the UTAS, this study utilizes the survey response regarding rural–urban-oriented economic policies from candidates running in the majoritarian tier of the mixed-member electoral system, from either the LDP or the DPJ during this period.[9] Respondents are usually provided with a statement and asked to select one of five responses: agree, somewhat agree, neutral, somewhat disagree, and disagree. The question set on the questionnaire was not necessarily the same in each survey. Some questions, such as promoting public works for increasing employment, were asked every time across the surveys, but others have been asked only once. The wording of each question and the election year in which they were asked are as follows.[10]

1) Public work for employment: Public construction projects are necessary to secure employment in rural areas (2003), or public construction projects are necessary to secure employment (2005, 2009, and 2012).

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[7]There was a significant redistricting in 2013 and 2017 that decreased the total number of majoritarian districts (300–295 in 2013, and further to 289 in 2017) and adjusted district boundaries for population balancing (42 and 97 districts, respectively).

[8]As an alternative approach, Catalinac used Wordfish (Slapin and Proksch, 2008) on the candidates' campaign manifesto to estimate the candidate policy position, such as the provision of particularistic vs programmatic goods (2016a, 2016b) or the left–right dimension (2018). These indicators could be better used to track the shift in the policy position and/or the electoral campaign focus of the party candidates in the long run, for example, before and after the LH electoral reform of 1994, as Catalinac did. This study used the UTAS candidate survey focusing on the policy position regarding specific policies, which would be better suited to examining dyadic representation. The candidate's level of correlation between the rural–urban policy position presented in this study and the proportion of the manifesto devoted to the 'pork' issue in the Catalinac paper is relatively strong (0.446 in 2003, 0.490 in 2005, and 0.549 in 2009). It is partly because the candidates who note the pork issue in their manifestos are affiliated with the LDP and run for rural districts. An issue of using proportion for this study's analysis is that proportion is much skewed to zero, in particular among the DPJ candidates.

[9]Some candidates switched party affiliation during the survey period. These candidates were likely to have considerably shifted their response following their switches by reflecting on the platform of their newly affiliated party. This study used their response while affiliated with either of the two major parties or running as independents. In other words, this paper did not use the response of the candidates after they switched to the other parties. For example, this paper uses the response of Yoshimi Watanabe (Tochigi 3) while he was affiliated with LDP (2003 and 2005), but not after he established a new party (Your Party) in 2009 and left LDP. In Japan, some candidates run as independents because they challenge their co-partisan incumbents (especially among the LDP) or run as joint candidates with endorsements from more than one party (especially among the DPJ). They usually join the parliamentary groups they were initially affiliated with once elected; therefore, this paper treats them as a quasi-party candidate and uses their response to the survey while running as independents.

[10]As discussed in the previous section, the LDP politicians supported public spending to stimulate the economy and as a redistribution tool from urban centers to rural areas – their power base – in the name of social equality, primarily via construction projects to create employment. They also support the protection of less competitive domestic industries, especially agriculture. Although the LDP Prime Minister Koizumi proposed it, the privatization of the postal service is also perceived as a conflict between the traditional LDP base in rural areas vs urban interest, which advocates for more libertarian policies. In contrast, the opposition often criticizes these strategies because it often spends money on economically inefficient projects with a murky tie with the LDP politicians, particularly under swelling public debt due to stagnant tax revenue and an aging population.

2) Balance budget vs fiscal stimulus: Government should spend fiscal stimulus for a while rather than cutting spending for fiscal reconstruction (2003, 2005, 2009, 2012).
3) Postal service privatization: Three postal services[11] should be privatized (2003).
4) Free vs building new highway: The government should make existing highways charge-free, rather than building new ones (2003).
5) Fiscal transfer from urban to rural areas: Fiscal transfers to rural areas should be abolished in principle (2003).
6) Keep spending for road construction: The government should maintain the current level of spending on road construction (2009).
7) Should join TPP: Japan should participate in the Trans-Pacific Partnership (TPP) (2012).

To utilize all responses for each questionnaire, this study used the graded response model (GRM) of the item response theory (IRT) with the 'ltm' package of R (Rizopoulos, 2006). IRT is a latent variable model. Latent variable models assume that a few latent variables explain the interrelationships in a set of observed response variables. The models assume that unobserved variables such as political attitudes, which cannot be measured directly by conventional means, can be quantified by assuming latent variables. The IRT considers a class of latent variable models that link mainly dichotomous and polytomous manifest variables to a single latent variable (Rizopoulos, 2006). The IRT is applied in political science to measure political knowledge (Delli Carpini and Keeter, 1993), legislators' policy positions (Clinton, 2007; Bafumi and Herron, 2010; Hirano et al., 2011; Shor and McCarty, 2011), Supreme Court judges (Martin and Quinn, 2002), and the voters' policy positions in legislative districts and municipalities (Tausanovitch and Warshaw, 2013, 2014). In particular, Hirano et al. used the model with the UTAS data to measure the distribution of policy positions of Japanese candidates, although they did not directly examine the association between the districts' and their candidates' policy preferences (Hirano et al., 2011).

The two-parameter (binominal) IRT models use binominal responses to exam question items (such as correct and incorrect). The responses depend on θ_i: the latent trait level for person i, β_j: the difficulty level for item j, and α_j: the discrimination power for item j, such that:

$$P(X_{i,j} = 1 | \theta_i, \ \beta_j, \ \alpha_j) = \frac{\exp[\alpha_j(\theta_i - \beta_j)]}{1 + \exp[\alpha_j(\theta_i - \beta_j)]}$$

$$s.t. \ \ i = 1, \ 2, \ 3, \ \ldots, \ n; \ j = 1, \ 2, \ 3, \ \ldots, \ m$$

The GRM extends the two-parameter IRT model with a binomial response to the ordinal multilevel response. Suppose that the response is provided with five categories: agree (1), somewhat agree (2), neutral (3), somewhat disagree (4), and disagree (5) for a statement as the UTAS. $P_{ij1}(\theta)$ represents the probability of person i choosing the first category for item j, $P_{ij2}(\theta)$ represents those for the second category, and so on.

$$P_{ijk}^*(\theta) = \frac{\exp[\alpha_j(\theta_i - \beta_{jk})]}{1 + \exp[\alpha_j(\theta_i - \beta_{jk})]}$$

$$s.t. \ \ i = 1, \ 2, \ 3, \ \ldots, \ n; \ j = 1, \ 2, \ 3, \ \ldots, \ m; \ k = 1, \ 2, \ 3, \ 4$$

$$P_{ij1}(\theta) = 1 - \ P_{ij2}^*(\theta)$$

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[11]Postal mail, savings, and insurance services.

$$P_{ij2}(\theta) = P_{ij2}^{*}(\theta) - P_{ij3}^{*}(\theta)$$

$$P_{ij3}(\theta) = P_{ij3}^{*}(\theta) - P_{ij4}^{*}(\theta)$$

$$P_{ij4}(\theta) = P_{ij4}^{*}(\theta) - P_{ij5}^{*}(\theta)$$

$$P_{ij5}(\theta) = P_{ij5}^{*}(\theta)$$

The IRT model has two specific characteristics that are convenient for this study. First, the 'test' parameters do not depend on the particular group of 'examinees' of the population. Moreover, the examinees' trait assessment does not depend on a particular set of question items (Fan and Sun, 2013: 45). In other words, the candidates responding to each survey do not have to be the same set of individuals. Certainly, those running in the 2003 LH election do not belong to the same group as those running in 2012. The IRT model works if there are some overlaps between the candidates: for example, candidate group A ran between 2003 and 2005, candidate group B ran between 2005 and 2009, and candidate group C ran between 2009 and 2012. Their parameters – latent policy preferences – can be measured on the same scale if some of them are answering the same survey items.

By utilizing the model, this study measures the latent policy position of each candidate, which is termed the *Urban–Rural (U–R) Policy Score*. For convenience, it assumes that larger numbers on the scale indicate support for a more rural-oriented position (e.g., more public spending for employment, road construction, rural area subsidy, and trade protection). In comparison, smaller numbers indicate support for an urban-oriented policy (e.g., less public spending, free trade, and economic efficiency).[12]

While using the model, it was assumed that candidates had a latent and fixed policy preference regarding economic policy during the period in which their responses to the questionnaires could be measured.[13] Hence, each candidate first chose his/her policy position regarding economic policy based on what aligned with his/her district (or political parties nominated such candidates) and did not change it after that. As discussed above, the candidates in Japan organize their personal campaign organization, koenkai, which should be well-tailored to district-specific interest. They might change their responses to a survey question with the same wording across elections due to the campaign's context, while they do not (or cannot) change their (latent) policy preferences, which is firmly structured with the organization.

Figure 1 shows the distribution of the *U–R Policy Score* of the LDP and DPJ candidates measured using this approach. The white histograms on the upside represent the LDP, while the gray ones on the downside represent the DPJ. These figures demonstrate substantial partisan differences in policy positions; however, considerable within-party heterogeneity and some overlap between the parties remain.

It is much more difficult to measure the policy position of the constituencies. The UTAS asks for the same set of policy questions for both candidates and voters. Nevertheless, it is problematic to use a

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[12]The difficulty parameters βj and discrimination parameters αj for individual items ($j = 1, 2, 3, …, 17$) are available in online Supplementary Table O1. Most of the discrimination parameters range from moderate (0.65–1.34) to very high (>1.70) (Baker, 2001: 34), except postal service privatization in 2003 (low: 0.374), which suggests that these items are well-loaded on one dimension. Excluding the item from the model does not change the result significantly.

[13]It is possible to relax the assumption in a way that the policy position of each candidate could alter between the elections as noted by Hirano et al. (2011). In this case, the parameters for each questionnaire should be fixed instead – a candidate with the same policy score should identically answer a question (the same probabilities are attached to each choice) even if it is asked in different elections. However, I chose not to use this option in this paper for the following reasons. First, the estimates of candidate policy scores would be less reliable, given that there are only two questions related to the issue asked across all the elections. As explained in the following section, the policy position of the constituencies is measured with an indicator not updated during the period – the employment structure of each district surveyed at the decennial census. Given the assumption that the constituency's position is fixed, it is more reasonable to assume that the policy position of the candidate is also fixed during this period.
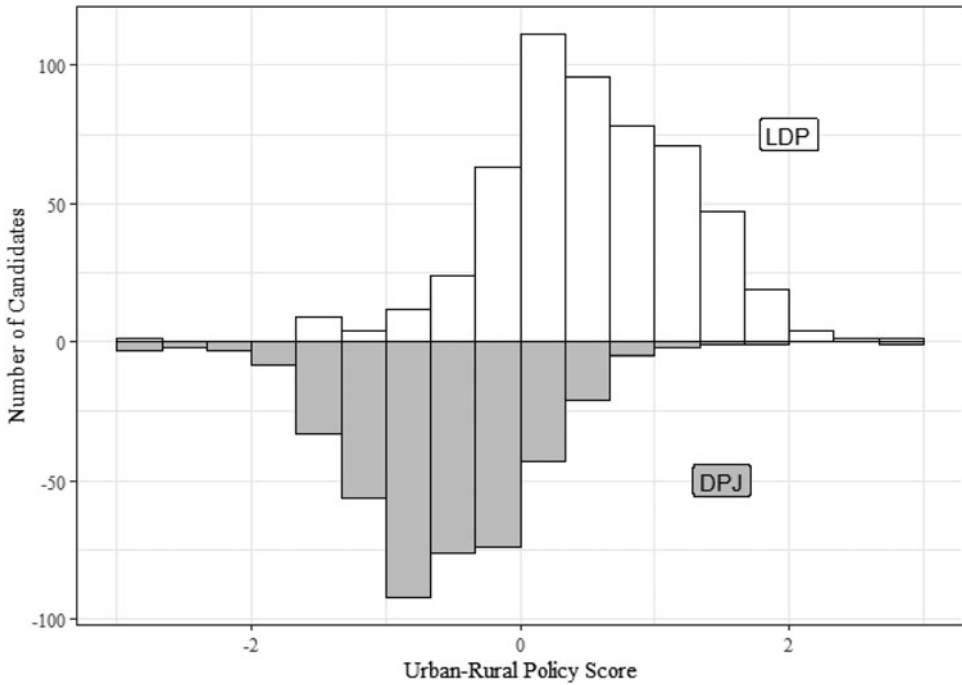
Fig. 1. LDP/DPJ candidate urban–rural policy score.

voter survey to estimate the policy position of the constituencies in the respective districts. First, the voter survey of the UTAS does not cover all of the LH districts, and the numbers of respondents in the respective districts are too small to estimate the policy position of the entire constituency with sufficient reliability.[14] Both low political interest and limited knowledge regarding individual respondents introduce a considerable measurement error to the estimate of the constituency preference, which is already limited by the small sample survey, even if the constituencies in the (district-) aggregate would have a reasonable opinion (Page and Shapiro, 1992).[15]

Instead, this study uses the employment structure of each district – more specifically, the ratio of the labor force in agriculture, forestry, fishery, and construction – as a proxy for the rural–urban level, and hence for the policy preference of respective constituencies. The higher the ratio, the more electorates prefer a candidate with a rural-oriented policy position. Figure 2 shows the distribution of the rural employment structure in the LH districts based on the 2010 census.[16] These rural sectors are often the focus of LDP mobilization through a patron-clientelistic exchange (Scheiner, 2006: 70–73) and indicate a high level of support for the LDP (Miyano, 1998; Mulgan, 2013).[17]

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[14]The UTAS conducted three-panel voter surveys between 2003 and 2013 (2003–2005, 2009–2010, and 2012–2013 respectively). The sample size of each survey was 3000, and the total number of respondents was around 2000 (response rate is 63–70%). On average, around 18% of the districts did not have any respondents at each wave.

[15]Analyses were conducted using a direct measurement of the district opinion by pooling three waves of the UTAS voter survey. Two questions (public work for employment, and balance budget vs fiscal stimulus) and on average 20 respondents per districts with the pooled samples are available for the approach. With the pooled sample, 297 out of 300 districts have respondents from at least one of the survey panels. The results are basically the same with those using the district employment structure discussed in this paper, but a weaker association was found when using the direct measurement. More detailed results are available in the online Supplementary material.

[16]Japanese census statistics regarding the LH districts is based on Nishizawa (2017).

[17]The existing studies in Japanese politics often use the proportion of the population that reside in *densely inhabited districts* (DID), the term defined in the Japanese census, as a proxy for the rural–urban level of the electoral districts (Horiuchi
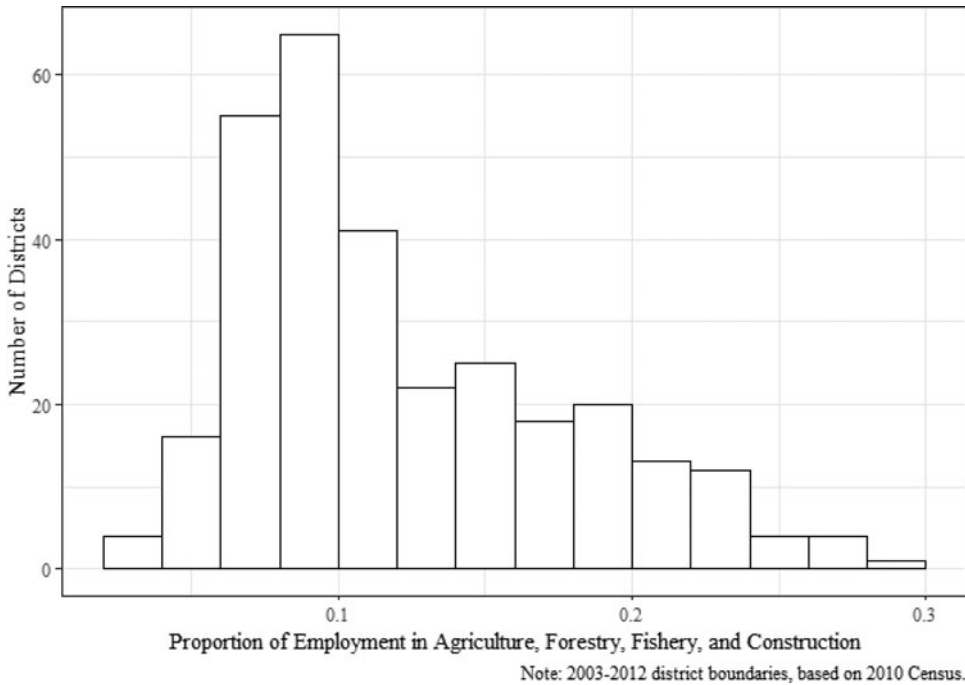
Note: 2003-2012 district boundaries, based on 2010 Census.

Fig. 2. Employment structure in Lower House districts.
Note: 2003–2012 district boundaries, based on 2010 Census.

4. Hypothesis and model

The main claim of this study was that the within-party variation in the candidates' policy positions would correspond to the policy preferences of their district constituencies. More specifically, it was expected that the district characteristics measured with the employment structure would be associated with the policy position of the candidates regarding economic issues. To verify this claim, the following hypothesis was tested:

H1: The more rural their district's employment structure is, the more rural-oriented the candidate's economic policy position will be, controlling for their party affiliation.

This hypothesis was tested with the ordinary least squares model, the *U–R Policy Score* – the policy positions of candidates in the urban–rural-oriented economic policy – as the outcome variable, and the district (rural–) employment structure (*RES*) and the candidate party affiliation (*PARTY*) as explanatory variables.

$$\text{Model 1:} U - RPolicyScore_i \sim \beta_0 + \beta_1 RES_i + \beta_2 PARTY_i + e_i$$

It was expected for voters to reward candidates representing the constituencies' policy preferences well in the election. Otherwise, the candidates would have little incentive to be faithful to their constituencies. The operational hypothesis to test this claim is as follows:

and Saito, 2003). However, as more people migrated to an urban area in Japan, the distribution of the index was skewed to its upper limit, 1. The proportion of the population residing in the DID was 93% or higher in a quarter of the LH districts surveyed between 2003 and 2012. The employment structure of each district was used in this study, which has a more bell-shaped distribution, as demonstrated in Figure 2. The correlation between the two indicators is still strong, at −0.814.

H2: The more rural the district's employment structure is, the more LDP candidates with a rural-oriented policy position gain vote share in comparison to their DPJ opponents (and vice versa).

This study ran the linear mixed-effect model by the districts in which the two major-party candidates compete to examine the effect. The outcome variable of the model was the two-party vote-share margin (*Margin*): (LDP candidate votes – DPJ candidate votes)/(LDP candidate votes + DPJ candidate votes). The explanatory variables were the difference in the policy scores between the LDP and the DPJ candidates (*PSD*), the district employment structure (*RES*), and the interaction term between them. The interaction term was included in the model because the same difference between the LDP and DPJ candidates in the economic policy should affect differently to their electoral outcome between rural and urban districts. The specification examines whether more significant differences in the rural-oriented policy position between LDP and DPJ candidates in the same district are associated with larger LDP margins of victory over their DPJ counterparts in districts with a larger proportion of the workforce in the rural sector than in districts with smaller proportions of the workforce in the rural sector.

As covariates, the model used the effective number of candidates (*ENC*) and the election year as the fixed effect (2003 as a reference) and dummy variables for each district and candidate as the random effect.

$$\text{Model 2: } Margin_{ij} \sim \beta_0 + \beta_1 PSD_{ij} + \beta_2 RES_i + \beta_3 PSD_{ij} \times RES_i + \beta_4 ENC_{ij} + \beta_5 2005\ Dummy_j$$
$$+ \beta_6 2009\ Dummy_j + \beta_7 2012\ Dummy_j + \gamma_i + \delta_k + \varepsilon_l + \delta_{ij}$$

where i denotes district, j denotes election year, k denotes specific LDP candidates, and l denotes specific DPJ candidates.

Due to the operationalization, the positive number in *Margin* indicates electoral results favorable to the LDP. The analysis focused on the coefficients for the difference in the respective policy positions (*PSD*), that is, β_1, and its interaction effect with the district's employment structure (*RES*), that is, β_3.

β_1 was expected to be negative. In highly urbanized districts where almost no one is involved in the agriculture, forestry, fishery, or construction sectors, an LDP candidate with a relatively rural-oriented policy position should attract fewer votes than their DPJ opponent (with high *PSD*). It was predicted that β_3 should be positive. In rural districts (with high *RES*), the constituencies are more likely to vote for the LDP if the LDP candidate is more favorable to rural interest than their opponent.

Finally, the marginal effects (and their standard errors) of the candidates' policy positions on electoral outcomes were examined, given the estimate of these coefficients and the employment structure of the districts (Brambor *et al.*, 2006).

5. Results

The results supported these hypotheses. Table 1 shows clear associations between the employment structure of the districts and the candidates' policy positions, as predicted in H1, even after controlling for party affiliation. The more rural their districts' employment structures were, the more rural-oriented the candidates' policy positions were. The effect size was substantive; the expected difference in the policy score between those running from the districts with the first quarter and third quarters of the employment structure (8.0 and 15.8%, respectively) was 0.403, and those in the 10th and 90th percentiles (6.6 and 20.2%) were 0.704, which were approximately 38 and 66% of the average partisan difference, respectively. The mean and the standard deviations of RES and the policy positions are 0.122 and 0.0542, and 0.000 and 0.876 respectively. An increase of a standard deviation of RES is expected to shift the candidates' policy position for 0.287 (5.171 × 0.0542), which is around a third of the standard deviation of the urban–rural scores (0.287/0.890 = 0.327).

Figure 3 graphically presents the association between the candidates' policy scores and the district's characteristics. The X-axis is the proportion of employment in the rural sector, that is, those in

Table 1. District employment structure and candidates' policy position with OLS model.

	Coefficient estimate	Standard error	Hypothesis test
Party affiliation (DPJ)	−1.061	(0.041)‡	Single-sided (negative)
Rural employment structure (*RES*)	5.171	(0.376)‡	Single-sided (positive)
(Intercept)	−0.113	(0.054)+	Double-sided
Number of observations	972		
Adjusted R^2	0.470		

Note: Statistical significance at +10%; *5%; †1%; ‡0.1%.

agriculture, forestry, fishery, and construction, whereas the *Y*-axis shows the *U–R Policy Score* of the LDP or DPJ candidates. The white circles show the LDP, and the circles filled with gray indicate the DPJ. The circle size demonstrates whether candidates had won at least once during the period (smaller circles mean those without victory), assuming that those unfit to their districts never had a victory. The two curves constitute the fitted curve for each party candidate with the same weight for each candidate. The figure, in sum, demonstrates the connection between the district's environment and the candidate's policy position, although a significant partisan gap exists in this position.

For example, in Tokyo 1, located in the center of Tokyo metropolitan area (rural employment structure: 2.6%), LDP nominated Yosano (−0.103; 16%, the candidates' policy score and percentile within their party, henceforth) between 1996 and 2009 and Yamada (−0.602; 5%) since 2012, while DPJ has been nominating Kaieda (−1.220; 14%) since 1996. In contrast, in Kochi 3, one of the most rural and least populous districts abolished in 2013 (rural employment structure: 27.7%), LDP had been nominating Yamamoto (0.975; 73%) since 1996, and DPJ ran Kawazoe (−0.411; 61%) in 2003 and Nakayama (0.607; 97%) in 2005 and 2009.

Next, Table 2 displays the results of model 2, which examined the vote-share margin between the LDP and the DPJ candidates as a function of their policy positions and their district employment
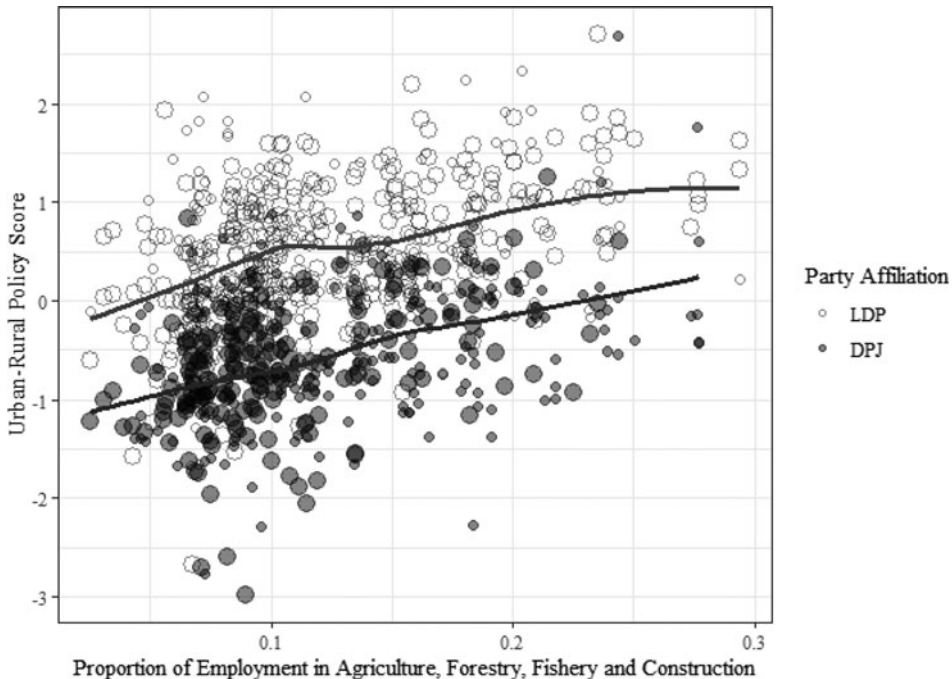

Fig. 3. Candidate policy score and district employment structure.

Table 2. Candidate policy position, district employment structure, and vote-share margin with the linear mixed-effect model.

Fixed effect	Coefficient estimate	Standard error	Hypothesis test
Difference in LDP and DPJ U–R Policy Score (PSD)	−0.069	(0.019)‡	Single-sided (negative)
Rural employment structure (RES)	0.249	(0.235)	Single-sided (positive)
PSD × RES	0.566	(0.149)‡	Single-sided (positive)
Effective No. of candidates	−0.035	(0.010)†	Double-sided
Election year dummy 2005	0.071	(0.008)‡	Double-sided
Election year dummy 2009	−0.195	(0.009)‡	Double-sided
Election year dummy 2012	0.174	(0.012)‡	Double-sided
(Intercept)	0.108	(0.042)†	Double-sided
Number of observations	811		

Note: Statistical significance at +10%; *5%; †1%; ‡0.1%.

characteristics. The coefficients of the candidate's policy position and their interaction terms with the district employment structures were all in the expected directions and were statistically significant. The standard deviations of the candidate random intercepts are 0.083 for the LDP candidates, 0.058 for the DPJ candidates, and 0.120 for the districts. Therefore, variations of the candidate random intercepts are smaller than that of the districts, but still, they could matter, especially for the LDP candidates.

Table 2 shows that in highly urbanized districts with a small proportion of the rural employment structure (i.e., *RES* is close to zero), the LDP candidates with more significant rural-oriented policy preferences than their DPJ opponents polled fewer votes (first row: the coefficient for the difference between the LDP's and DPJ's *U–R Policy Scores* was negative). By contrast, they could mobilize more support in rural, high *RES* districts (third row: the interaction term's coefficient for the policy difference and the district employment structure was positive).

Figure 4 shows the marginal effects of the policy score difference on their vote share, given the employment structure of their districts based on the estimate in Table 2. This figure shows that the policy score difference had a statistically significant influence on the electoral outcome if more than 16% or less than 9% were employed in rural sectors, which corresponded with around 24% of most rural districts and 36% of most urban districts, respectively.

Figure 5 shows the simulated effects of the LDP candidate policy position in their vote-share margin based on model 2 while holding the DPJ position to their party median. Each bar corresponds with a district with a rural/urban dimension (at the 10th, 25th, 50th, 75th, and 90th percentiles), the height of the bar reflecting the expected vote swing in favor of the LDP.

The effect size was considerable. Suppose the LDP candidates have a position at their party median in urban districts (10th/25th percentile in the employment structure). In that case, the electoral outcomes slightly shift to the DPJ advantage (3.8 and 3.0%, respectively), while in rural districts (90th/75th percentile in the employment structure), the outcomes tilt toward the LDP advantage by 1.4 and 3.9%, respectively.

The effect becomes even more significant if the candidates take extreme positions. If the LDP candidates have a rural-friendly policy stance (25th percentile within the party), they will shift the electoral outcomes by 12.5% in their favor in very rural districts (90th percentile in the employment structure). By contrast, if an LDP candidate holds an urban-oriented position (e.g., 75th percentile within the party), their advantage in the rural areas decreases to only 1.1%. These results suggest that LDP candidates can win in rural districts by belonging to the party known for favoring rural interests and additionally by, within their party, actually taking the policy positions favored by the rural electorate.

Even a few percent of the vote share attainable by choosing the appropriate position could change the electoral results in districts, or even the national direction, given the competitive races between the LDP and the DPJ candidates during the 2000s.
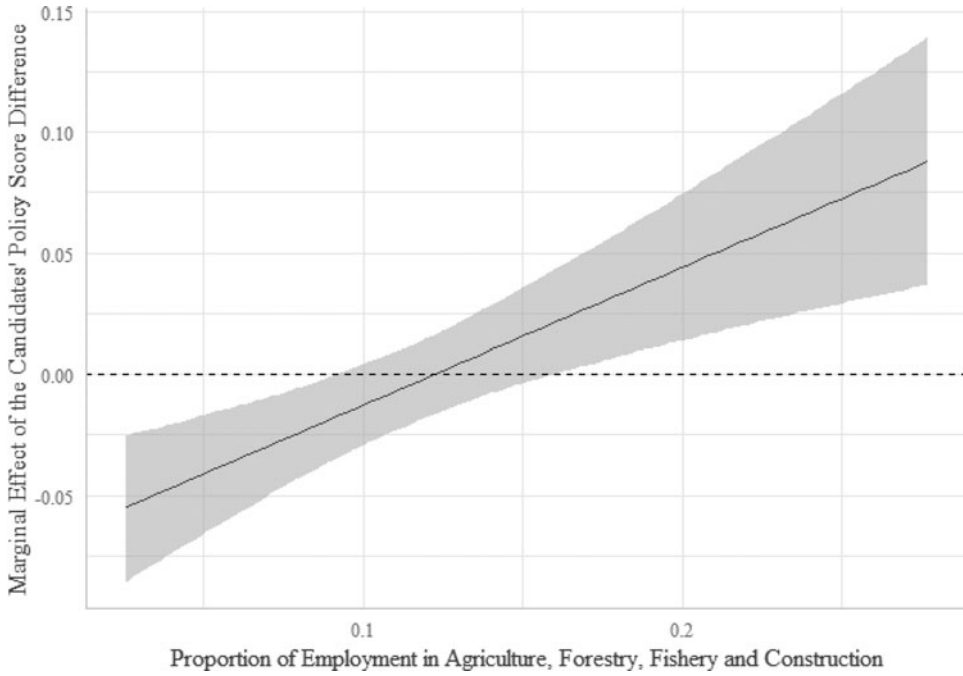
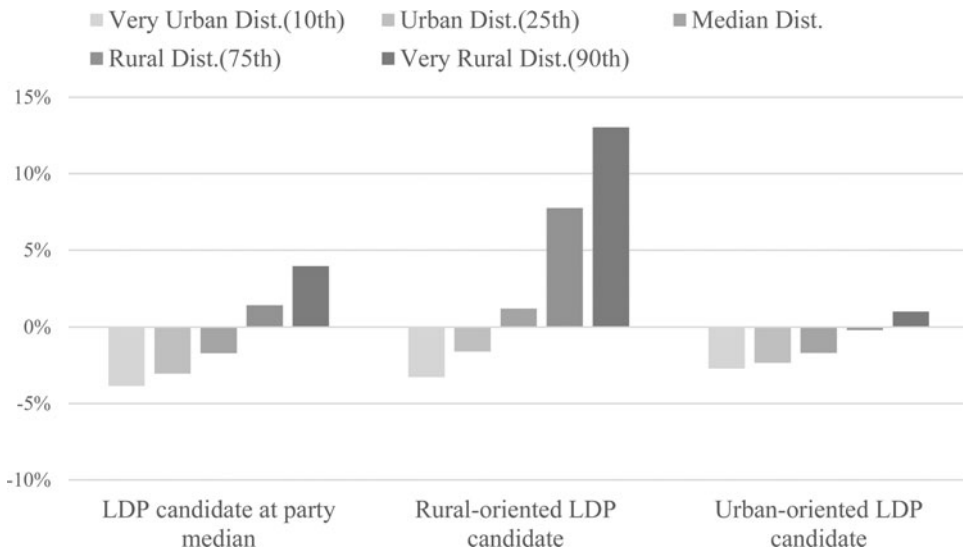**Fig. 4.** Marginal effects of policy difference for the electoral outcomes.

Fig. 5. LDP candidate policy score and expected vote-share margin shift given the district employment structure.
Note: The policy score of the DPJ candidate is kept at their party median.

6. Conclusion and discussion

The evidence presented in this study supports the view of dyadic representation in Japan. There is a clear association between the candidates' policy positions across the two major parties in urban–rural

economic policy – one of the most salient, straightforward, and geographically divisive issues in Japanese politics – and the employment structure of each district – a proxy indicator of constituency policy preference. In other words, party candidates in Japan adapt to their district policy preferences (or political parties assign these candidates), as is done in other countries, especially by the US Congress. This study also demonstrates that voters in respective districts rewarded those individually holding their preferred policy positions by casting more votes for them.

Furthermore, this study indicates a clear difference in policy position between parties, even when they are running for the same or very similar districts. A similar pattern has also been observed in the USA (Bafumi and Herron, 2010). There may be various factors behind the partisan gap. First, major party candidates represent both their local constituencies and their national/partisan support base, as discussed in previous studies (Thomassen, 1994). They eventually must follow their party leadership in the legislative session, even if it could hurt their electoral fortune. They would transmit the views of their district to the party leaders via a formal party institution such as the LDP PARC or an informal meeting before the legislative session. However, suppose they initially take a policy position that is too disparate from the party platform. In this instance, they will likely choose either to violate party discipline in the deliberation and receive punishment from the party leaders (which may include no nomination in the next election) or to receive electoral punishment from their constituencies as a 'traitor.' The mixed-member electoral system in Japan also induces candidates in the majoritarian tier, regardless they are running from major or smaller parties, to present their party's platform as the party's face in the districts to mobilize PR votes.[18]

Party leaders also face a trade-off regarding the extent to which they should allow policy diversity within their parties. This within-party variation would benefit the party by increasing the vote share of each candidate, and consequently, the seat shares of the party. The lack of consistency within the party would hurt the credibility of the party label; moreover, party leaders may find it challenging to coordinate party policies if their MPs have diverse positions based on their district concerns. LDP leaders, for example, often face strong opposition from their MPs elected from rural districts against the trade liberalization of agricultural products.[19] Dissatisfaction among them could lead to the breakup of the party in the long run.

Next, candidates may look for support from the (re)election constituencies, not from the general (geographical) constituencies (Fenno, 1978). Election constituencies are sub-constituencies that assure electoral victories without much conflict with their party platforms. Usually, around a third of the votes in the district are sufficient to secure a victory, given the relatively low turnout in the Japanese LH (60–70%) and frequent participation of minor-party candidates with little chance of victory, but who gain a few percent of the votes in the districts.

The results also have some implications for the nature of electoral competition in Japan. It is not directly clear whether this competition is based on programmatic vs clientelistic linkages, which scholars have debated (Catalinac, 2016a; Muraoka, 2018). The urban–rural economic issue is understandable from both perspectives: building infrastructure in a rural area or protecting the agricultural sector could be programmatic. In contrast, these policies also provide particularistic benefits to their loyal supporters. Regardless of which interpretation is correct, the result implies that candidates of the two major parties run campaigns on their national/partisan platforms and with concerns for their respective districts.

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[18]As described above, the Japanese LH uses a mixed-member majoritarian electoral system combining the single-member majoritarian and PR tiers. Each voter has two votes and casts them separately; however, their voting may not be independent between the tiers. For example, as discussed above, a party may mobilize additional PR votes if it runs candidates in the majoritarian tiers, i.e., contamination effect. Moreover, the LDP supporters are sometimes instructed by their party cadres to cast PR vote for the LDP coalition partner, the Clean Government Party (CGP, also known as Komeito) as an exchange for the CGP support for the LDP candidates in majoritarian tier (Catalinac and Motolinia, 2021).

[19]For example, feeling pressure from the Japan Agricultural Cooperatives and its affiliated farmers, the LDP MPs elected from rural areas fiercely opposed the Trans-Pacific Partnership, a proposed trade agreement between 12 countries in the Pacific region (Maclachlan and Shimizu, 2016: 175–177).

The UTAS, the series of candidate surveys utilized in this study, offers a unique opportunity to measure candidate-level preferences for incumbents and challengers alike, with high reliability owing to its very high response rate and continuity. The UTAS made it possible to examine the effect of the relative attractiveness of each candidate's policy position on their electoral outcomes. While (theoretically) other approaches are possible, such as text analysis of candidates' campaign manifestos (Catalinac, 2016a, 2016b, 2018) or cross-national candidate surveys (e.g., the Comparative Candidate Survey), this type of analysis is not easily accessible, which makes it a critical test case for theories of dyadic representation.

Finally, this study expands the horizon for future studies on dyadic representation. As discussed above, dyadic representation has been examined primarily in the context of the US Congress. Recently, Hanretty *et al.* investigated a link in the UK. Despite its contribution, their scope remains restricted to other countries with a Westminster-style system of governance and election (e.g., Australia or Canada, Hanretty *et al.*, 2017). By contrast, this study examines a dyadic link in the majoritarian tier of the mixed-member electoral system, especially its majoritarian variant, used in many countries since the 1990s (Shugart and Wattenberg, 2001). Studies in a broader group of countries would enhance the understanding of this representation, such as the balance between local/individual and national/collective across countries and issues.

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Appendix

Wordings of UTAS Candidate Survey Questions Related to Urban–Rural Economic Policy (Translated).

– Do you agree or disagree with the opinions below from number one to X? Please mark one number for each item from 1 to X.

1: Agree, 2: Somewhat Agree, 3: Neutral, 4: Somewhat Disagree, 5: Disagree

Public Work for Employment

Public construction projects are necessary to secure employment in rural areas (2003).

Public construction projects are necessary to secure employment (2005, 2009, and 2012).

Balance Budget vs Fiscal Stimulus (2003; 2005; 2009; 2012)

– Government should spend fiscal stimulus for a while rather than cutting spending for fiscal reconstruction.

Postal Service Privatization (2003)

– Three postal services[20] should be privatized.

Free vs Building New Highway (2003)

– The government should make existing highways charge-free, rather than building new ones.

Fiscal Transfer from Urban to Rural Areas (2003)

– Fiscal transfers to rural areas should be abolished in principle.

Keep Spending for Road Construction (2009)

– The government should maintain the current level of spending on road construction.

Should Join TPP (2012)

– Japan should participate in the Trans-Pacific Partnership (TPP).

– Is Your Opinion Closer to A or B?

1: Closer to A, 2: Somewhat closer to A, 3: Neutral, 4: Somewhat closer to B, 5: Closer to B.

Economic Efficiency vs. Social Equality (2012)

A. We should prioritize improving economic competitiveness, even if it increases social inequality.
B. We should reduce social inequality, even at the cost of economic competitiveness.

Protecting Domestic Industry vs Trade and Investment Liberalization (2009; 2012)

A. We should protect domestic industry.
B. We should liberalize trade and investment.

Should We Increase/Decrease Spending for Public Works? (2009)

Considering Japan's future, for which policy areas do you think we should INCREASE the national budget? Mark each relevant field.

1) Public works

For which policy areas do you think we should DECREASE the national budget? Mark each relevant field.

1) Public works

The response was coded as one if the candidate chose INCREASE, three if he/she chose DECREASE, and two if he/she chose neither.

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[20]Postal mail, savings, and insurance services, as in the footnote 11.