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WORKING PAPER

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ABSTRACT
In Europe and the US, regional inequalities have been linked to growing electoral support for right-wing populist parties. In contrast, Japan's rapidly shrinking rural areas have continued to support the ruling Liberal Democratic Party (LDP). This makes Japan a productive case to investigate factors that moderate the electoral effects of regional decline. This paper analyzes municipal-level electoral data across four general elections between 2012 and 2021 to investigate the relationship between regional decline, interregional redistribution, and electoral behavior in Japan. We focus on municipalities designated as "rapidly depopulating", which display above-average levels of population decline and economic dependency, based on which they receive additional government support. "Depopulating municipalities" feature stronger support for the LDP-led coalition and higher turnout. This electoral profile is most pronounced in "depopulating municipalities" that remained intact during a wave of municipal mergers in the mid-2000s. The results suggest that the combined effects of high aging rates, interregional redistribution and relatively stable socio-spatial boundaries affect electoral behavior in declining regions in ways that can benefit the established conservative party.

KEYWORDS
Rural decline; depopulation; electoral behavior; Japan; redistribution; regional inequality; peripheralization.

1. Introduction

The rise of right-wing populism across Europe and in the US has triggered a vibrant academic debate on the sources and the electoral consequences of discontent in rural and deindustrializing regions that are – or feel – "left behind" (Cramer 2016; Rodríguez-Pose 2018; Essletzbichler, Disslbacher, and Moser 2018; Dijkstra, Poelman, and Rodríguez-Pose 2020; Mamonova, Franquesa, and Brooks 2020; Rodríguez-Pose,

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Terrero-Dávila, and Lee 2023). However, regional decline is a multifaceted phenomenon which does not always cause discontent (van Vulpen, Bock, and van den Berg 2023), and does not necessarily favor right-wing populist parties alone (Sanchez-Garcia, Rodon, and Delgado-Garcia 2024). So far, our understanding of the factors moderating the electoral effects of regional decline is limited. This is not least because the literature on the "geographies of discontent" is biased towards populist surges in a relatively narrow set of cases in Europe and the US. Once we look beyond the cases that dominate the existing literature, there are regions which display socio-economic and demographic indicators of being "left behind" without obvious signs for discontent (Tups, Sakala, and Dannenberg 2023). Extending the analytical focus to such cases can enhance our empirical and theoretical understanding of compositional and contextual factors that moderate (i.e., amplify or decrease) the relationship between regional decline and electoral behavior.

Against this background, this paper analyzes electoral behavior in Japan's "depopulating regions". Although large parts of rural and semi-rural Japan have been subject to decades of depopulation and economic dependency, Japan appears to be a "post-populist island of stability" (Harris 2019) – or at least, those parties and politicians labeled as "populist" have not explicitly appealed to regional decline.[2] Apart from a brief intermezzo in 2009, rural areas have continued to support the ruling Liberal Democratic Party (LDP), which returned to power in 2012 and won every election since then. Amid low electoral participation, rural areas also display higher turnout in recent elections. This *relative electoral stability* in the face of ongoing socio-economic decline presents an intriguing puzzle. Existing explanations point to the persistent overrepresentation of rural areas or emphasize ongoing transfers to aging towns and villages. Yet, the concrete relationship between such transfers, regional decline, and electoral behavior remains understudied.

To address this gap, we compiled a novel data set that breaks down the results of the four general elections since the LDP returned to power in 2012 to the municipal level. We focus on so-called "depopulating regions" (*kaso chiiki*). This status is given to municipalities which display certain levels of long-term outmigration and aging as well as below-average fiscal strength. Based on these fixed criteria, they receive additional fiscal support under the "Kaso Law", one of Japan's most consistent place-based spending programs. At the same time, many – but not all – of these designated "depopulating municipalities" were subject to a wave of municipal mergers in the mid-2000s. The merger wave was consistently associated with negative effects on both turnout and LDP support (Yamada 2021; Horiuchi, Saito, and Yamada 2015). Distinguishing between merged and non-merged "depopulating municipalities" allows us to test how these contextual factors (mergers and eligibility for place-based support) interact with compositional factors to moderate the electoral effects of protracted regional decline.

We find significant differences between various types of "depopulating" municipalities. Most importantly, the combination of being designated as a "fully depopulating" municipality and remaining intact during the mid-2000s merger wave causes higher levels of support for the ruling coalition (LDP and Kōmeitō) *and* higher turnout – although (or rather *because*) these municipalities have the highest aging rates. The merger wave reduced the number of municipalities with these conditions. So far, however, this has negative effects on turnout, but not on support for the ruling coalition. Our findings add to the literature on the electoral effects of regional decline by showing

[2] On populism in Japan, see Fahey, Hino, and Pekkanen (2022) and Yoshida (2020). On Koizumi's "neoliberal populism", see Ōtake (2006).

how compositional and contextual factors can interact to *increase* electoral participation and support for incumbent (conservative) parties in depopulating regions instead of producing visible signs for electoral discontent. Especially the relationship between long-term depopulation, administrative restructuring, and place-based policy support offers a promising new angle for comparative studies.

2. The electoral effects of regional decline

A rapidly growing literature links regional disparities to electoral support for anti-establishment politicians and parties in Europe and the US. Existing explanations for the "geographies of discontent" tend to revolve around the electoral effects of depopulation, especially where it occurs as the result of outmigration of younger generations to urban centers. While some studies isolate depopulation from other factors to explain support for right-wing populists (Diermeier 2020), demographic decline is typically associated with a combination of contextual and compositional effects that spur anti-establishment voting. Shrinking regions become trapped in a "negative spiral of social and economic developments" (van Leeuwen, Vega, and Hogenboom 2021). The resulting degradation of the living environment (e.g., eroding service provision) has been found to increase support for right-wing populist parties (Rickardsson 2021). Depopulation further changes the socio-demographic composition of regions, which arguably results in a higher share of voters who are receptive to the electoral appeal of right-wing populist challengers (e.g. Dancygier et al. 2024; van Leeuwen, Vega, and Hogenboom 2021; Rodríguez-Pose, Lee, and Lipp 2021).

However, the causal link between regional decline and anti-establishment voting is not as straightforward as it appears (Ejrnæs et al. 2024). The literature on the "geographies of discontent" tends to sideline potential heterogeneous electoral effects of regional decline, or conflates issues such as depopulation, economic decline, and rural-urban differences (Sanchez-Garcia, Rodon, and Delgado-Garcia 2024). Yet, regional decline is not necessarily "rural", and not always (or not only) benefits right-wing populist parties. Voters in "left behind" regions may simply abstain from elections (Bourdin and Tai 2022). Moreover, contextual effects (such as relative municipal size) and compositional effects (such as higher aging rates) can interact to moderate the electoral effects of population loss in ways that benefit established parties. In the case of Spain, for example, a higher share of elderly residents in smaller depopulating municipalities makes for "frozen" political allegiances, which favors the mainstream conservative party. Only municipalities at the brink of extinction lean towards radical right populists (Sanchez-Garcia, Rodon, and Delgado-Garcia 2024). Similarly, higher emigration rates in Italy increased support for status-quo parties, but decreased support for anti-establishment parties and led to lower turnout (Anelli and Peri 2017).

Against this background, we argue that it is important to expand the focus to specific political and institutional factors that moderate electoral behavior in declining regions. One of these factors are changes in relative municipal size due to administrative restructuring. Just as depopulation can contribute to "frozen" political allegiances in municipalities with stable boundaries (Sanchez-Garcia, Rodon, and Delgado-Garcia 2024, 9), changes in relative municipal size may destabilize electoral behavior. Increasing municipal size is consistently linked to negative effects on political efficacy and electoral participation (McDonnell 2020). In some cases, administrative restructuring and the resulting retreat of the state benefits right-wing populists (Blesse and Rösel 2017; Cremaschi et al. 2024). While the effects of municipal mergers are mostly local,

there are cases – including Japan – in which mergers occur in waves, which arguably amplifies their national-level political and electoral effects (Yamada 2021).

Furthermore, electoral behavior in declining regions can also be moderated by the allocation of place-based policies to correct for uneven development. Some studies find that regional transfers have long-lasting effects on electoral preferences in subsidized communities (Albanese, de Blasio, and Incoronato 2024), and can even reduce the short-term appeal of populist parties in targeted regions (Albanese, Barone, and de Blasio 2022). Conversely, however, "misguided" or inefficient regional development programs have also been linked to increased economic dependency and thus potentially electoral discontent in "left behind" regions (Rodríguez-Pose 2018, 202-4). Finally, it is worth noting that areas that might be considered "left behind" can at the same time be electorally overrepresented. Across Europe, rural overrepresentation has been found to decrease gaps in "external political efficacy", i.e., the feeling that rural areas "don't matter" to politicians (García del Horno, Rico, and Hernández 2023).

3. Electoral stability despite regional decline in Japan?

Japan provides an ideal case to expand our understanding of how relative municipal size and eligibility for place-based support programs moderate the relationship between long-term regional decline and electoral behavior. Throughout the postwar period, the LDP had secured its power by catering to the interests of voters in structurally disadvantaged, but electorally overrepresented rural areas – in the form of agricultural subsidies, public works, and place-based spending, such as the program to support designated "depopulating regions" this paper focuses on. However, these transfers did little to solve the underlying causes of demographic decline and economic dependency in large parts of non-metropolitan Japan – rather, ongoing outmigration increased rural electoral overrepresentation, which the LDP exploited to sustain its electoral dominance (Matanle, Rausch, and The Shrinking Regions Research Group 2011; Rosenbluth and Thies 2010; George Mulgan 2000).

In the mid-1990s, a major electoral reform introduced a mixed-member majoritarian system (MMM) for the more important Lower House,[3] and reduced (but not eliminated) malapportionment – both of which led the LDP to reconsider its dependency on shrinking rural areas (Yamada and Arai 2020). This "urban turn" was most pronounced during the Koizumi administration (2001-2006), which pushed for neoliberal agricultural reforms and reduced central-local fiscal transfers. The latter induced the "Heisei wave of municipal mergers" (2002-2006), during which the number of municipalities – the lowest level of public administration in Japan – dropped from more than 3,000 to currently 1,718. The merger waves increased the size of municipalities as well as their internal heterogeneity (Yamada 2021). Notably, it affected almost exclusively highly indebted aging towns and villages, where mergers were associated with a loss of local identity (Rausch 2016), or uneven allocation of public goods (Pickering, Tanaka, and Yamada 2020). Moreover, the mergers drastically reduced the number of mayors and local assembly members. These local politicians and their networks have been vital to mobilize voters especially for the LDP. Consequently, the mergers did

[3]Currently, 289 members are elected from single-member districts (SMD) and 176 members are elected via proportional representation (PR) in 11 regional blocks. Because both tiers are separated, the larger SMD-tier significantly outweighs the proportional element. The size of the Lower House has been steadily reduced from 500 seats in 1996 (300 SMD, 200 PR) to 480 seats between 2000 and 2014 (300 SMD, 180 PR) to 475 seats in 2014 (295 SMD, 180 PR) to 465 since 2017 (289 SMD, 176 PR).

not only erode local political representation, but also had negative effects for turnout and LDP support in subsequent national elections (Yamada and Arai 2020; Yamada 2021; Horiuchi, Saito, and Yamada 2015).

The historical victory of the Democratic Party of Japan (DPJ) in the 2009 Lower House elections was widely seen as signaling the end of the alliance between rural voters and the LDP (Chiavacci 2010). However, the LDP regained control of the Lower House in 2012, and comfortably won in 2014, 2017 and 2021. Despite an at times alarmistic discourse on Japan's "disappearing" regions, no party (including a heterogeneous group of "third parties") mobilized the issue of regional decline against the LDP in these elections (Chiavacci 2018; Hijino 2016; Pekkanen, Reed, and Smith 2023). Noticeably, the LDP benefited from the collapse of the main opposition party (the DPJ), which was reflected not least in low turnout rates. After hitting an all-time low of 52,66% in 2014, turnout recovered only slightly in 2017 to reach 55,93% in 2021. Yet, a simple breakdown of the results by single-member districts shows that rural areas display not only higher levels of support for the LDP but also higher turnout, which suggests that rural voters are at least not visibly more frustrated with their electoral options than their urban counterparts.[4]

3.1. *The missing link between regional decline and electoral stability*

Did the LDP really avoid lasting electoral backlash from Japan's rapidly shrinking regions – and if so, how? The concrete relationship between regional decline and electoral behavior in Japan has remained understudied. One compositional factor that certainly matters is aging – rural areas in general have higher aging rates, and older voters in Japan are more likely to vote (Buchmeier and Vogt 2024). Closely related, persistent rural overrepresentation arguably amplified rural interests such as the "farm vote" traditionally associated with the LDP (Feldhoff 2017). However, the farm vote remained more contested since 2012 (Maclachlan and Shimizu 2016) and does not necessarily represent the rural, let alone the "depopulating" vote. Others note that the LDP still "channels a lot of money to dying towns and villages", so that voters "can hardly refer to themselves as the 'forgotten people' " (Penn 2021). Yet, there is little concrete evidence if and how such transfers moderate the electoral effects of regional decline. While incumbents continue to strategically allocate non-programmatic goods under the MMM system, allocation is not restricted to rural, let alone depopulating areas (Catalinac and Muraoka 2021).

In contrast, other transfers are directly tied to (demographic) decline. One of the most prominent and consistent examples is the program to support "depopulating regions". Under the "Kaso Law" (first introduced in 1970), municipalities with certain levels of long-term population loss, high aging rates, as well as a score of 0.5 or less according to the "fiscal strength index"[5] are recognized as "depopulating regions" (*kaso chiiki*). Based on these criteria, they receive additional funds on top of the regular Local Allocation Tax (LAT), most importantly in the form of government bonds (*kaso sai*). While the "Kaso Law" was renewed periodically and eligibility criteria were

[4]Following Maeda (2017), we classified the SMDs based on population density and presented the results in Table A1. SMD without densely inhabited districts (DID) are classified as "rural". The remaining three are classified based on DID shares. "Semi-rural" (7–47%), "semi-urban" (48–82%) and "urban" (83–100%). SBJ (1998) defines DID as "an area, a city, a town or a village that is composed of groups of contiguous basic unit blocks each of which has a population density of about 4,000 inhabitants or more per square kilometer, and whose total population exceeds 5,000".

[5]The fiscal strength index measures the amount of standard financial revenue divided by the amount of standard financial demand over the past three years (MIC n.d.).

adjusted, the program is in place until today, and its overall volume – in line with rural depopulation – has continued to increase. In 2021, 820 of Japan's 1,718 municipalities (excluding municipal wards) were designated as depopulating (see Appendix B for details).

Yet, if and to what extent this program indeed affects electoral behavior is an open question. *Kaso* funds were used almost exclusively for infrastructural projects (roads, dams, community centers, etc.).[6] This did little to resolve the underlying problems (Matanle, Rausch, and The Shrinking Regions Research Group 2011, 250-1) – rather, the program resembles the kind of inefficient development programs associated with electoral discontent in Europe (Rodríguez-Pose 2018). Moreover, in contrast to non-programmatic goods, additional support under the "Kaso Law" is allocated based on fixed criteria, which cannot be easily manipulated to boost electoral support. In general, if and why such *programmatic* support benefits incumbents is a matter for debate (for opposing arguments, see Araujo 2021; Imai, King, and Rivera 2020). In Japan, a similar program to support disadvantaged regions (a "snow subsidy") did not have significantly effects on LDP support in Lower House elections 1980-2005 – it did, however, correlate with a higher allocation of non-programmatic goods (Catalinac and Muraoka 2023), which suggests that the electoral effects of programmatic spending should not be analyzed in isolation.

4. Methods and data

For a more nuanced picture of the factors moderating the relationship between regional decline and electoral behavior in Japan we break down the results of the four most recent Lower House elections since 2012 to the municipal level. Most related studies focus on single-member districts, which can be categorized by population density (e.g. George Mulgan 2013, 2017; Maeda 2017; Feldhoff 2017), or socio-economic profiles (e.g. Takagi 2010) Yet, especially non-metropolitan SMDs consist of several municipalities, which can differ substantially based on their socio-economic characteristics and electoral behavior (see Figure 1). Zooming into these municipal-level differences allows us to test how compositional effects of regional decline (such as high share of primary-sector employment) interact with contextual factors (such as the status as "depopulating municipality") to affect electoral behavior.

Regarding electoral behavior, our main variables of interest include support for the ruling coalition, i.e., the LDP and the Kōmeitō, a smaller party with close ties to the Buddhist organization Sōka Gakkai. We refrained from focusing on LDP support alone, because LDP and Kōmeitō have established a strategy to maximize electoral success under the MMM system, which includes coordinating SMD candidates (Liff and Maeda 2019). To approximate the competitiveness of the elections, we also account for support for the main opposition camp, which most importantly includes the center-left DPJ and its successor, the Constitutional Democratic Party of Japan (CDPJ). In the absence of a consistent populist contender, we further measure electoral support for a heterogeneous group of "third parties", i.e., parties that are neither associated with the ruling coalition nor the main center-left opposition. Following Maeda (2017), this group includes (neo-)liberal/right-wing parties such as the Japan Innovation Party as well as the Japanese Communist Party (JCP). We assume that a higher share of support for these "third parties" signals frustration with the established political forces.

[6] Only since 2010, a small share goes to "soft" measures such as community-building, see Appendix B.

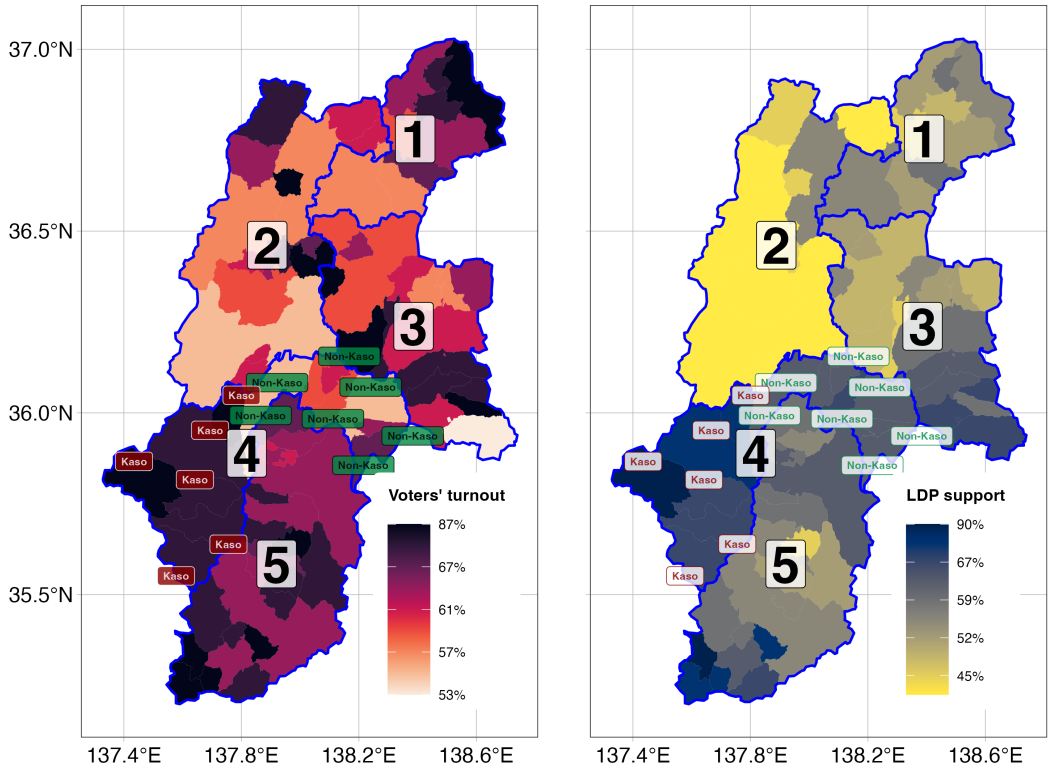

Figure 1. The electoral map of Nagano Prefecture (Lower House elections 2021, municipal level) illustrates significant municipal-level differences regarding both LDP support and turnout within the same single-member district (1-5).

Finally, we are interested in turnout. Low turnout can indicate lingering discontent in "left behind" regions (Bourdin and Tai 2022), but also insufficient mobilization. Especially in MMM systems, low turnout is also linked to a lack of electoral competition (Maeda 2016). Conversely, we argue that a *combination* of high turnout, high support for the ruling coalition, and low support for "third parties" indicates *relative electoral stability*.

As our main explanatory variables, we focus on whether municipalities are designated as "depopulating region" and whether they were subject to the mid-2000s merger wave. Building on Horiuchi, Saito, and Yamada (2015) and Yamada (2021), we assume that the mergers thinned out the ties between voters and (local) politicians, which potentially has lasting negative effects on voter mobilization and LDP support. While existing studies on the political and electoral effects of the mergers do not account for uneven levels of socio-economic decline or the *kaso* status, we are interested in how these variables are interrelated. Per definition, "depopulating municipalities" are rapidly aging and fiscally weak. Consequently, the mid-2000s merger wave directly affected many designated "depopulating" towns and villages, which lost their municipal status and were absorbed into larger municipalities. As a response, the government created new categories. Municipalities that meet all requirements stipulated in the "Kaso Law" are designated as "fully depopulating" (*zenbu kaso chiiki*). Notably, more than half of this group (65%, see Table A2) are small towns and villages that *remained intact* during the Heisei merger wave. Municipalities that have absorbed one or more "depopulating region" during the mid-2000s merger wave, but do not fulfill all the criteria to qualify as a "fully depopulating" municipality, are

categorized as "partly depopulating" (*ichibu kaso*). They also receive *kaso* support, but these additional funds can only be used for the parts of the municipality that are officially designated as "depopulating".[7]

We expect to find significant differences in electoral behavior between different types of merged and non-merged "depopulating municipalities". More specifically, we hypothesize that the combination of high primary-sector employment, the designation as a "depopulating municipality", and remaining intact during the mid-2000s merger wave produces relative electoral stability in terms of higher support for the ruling coalition, higher turnout, and lower support for "third parties".

4.1. *The data set*

We built our data set using municipal-level data of the electoral results of the four Lower House elections between 2012 and 2021 provided by the Ministry of Internal Affairs and Communications (MIC). As seen from Table A2, apart from cities (*shi*), towns (*chō*), and villages (*son*) (1,719 in 2012, 1,718 since 2014), we also included Tokyo's 23 "special wards" as well as wards within "designated cities" (pop. $>$ 500,000), arriving at a total number of 7,577 observations (1,895 in 2012, and 1,894 in 2014, 2017 and 2021 respectively). As mentioned above, our main electoral variables of interest are: support for the ruling coalition (LDP and Kōmeitō), support for the center-left opposition camp surrounding the DPJ (since 2017 CDPJ),[8] support for a heterogeneous group of "third parties",[9] and turnout. Turnout was calculated as the number of total votes cast divided by the number of eligible voters within each municipality.[10]

According to Table A3, median support for the ruling coalition (LDP+Kōmeitō) during the past four elections constitutes 52% in the SMD-tier (rising from 49% in 2012 to 54% in 2021) and 48% in the PR-tier (rising from 43% in 2012 to 52% in 2021). Notably, median support for the main opposition also grew from 22% to 34% in the SMD-tier and from 18% to 27% in the PR-tier.[11] The support for "third parties" has been fluctuating, with the median values standing at 14% and 27% in the SMD- and

[7] A relatively rare third category are "quasi-depopulating" municipalities (*minashi kaso*), i.e., (merged) municipalities that do not meet all requirements to qualify as "fully depopulating" but exceed certain thresholds of depopulation. We treat them as "fully depopulating" in our data set (see Appendix B for details on the criteria).

[8] The main opposition camp includes the Social Democratic Party (*Shakai Minshu-tō*) for all elections from 2012 till 2021, Democratic Party of Japan (*Minshutō*) for 2012 and 2014, Constitutional Democratic Party of Japan (*Rikken-minshutō*) for 2017 and 2021, and Democratic Party for the People (*Kokumin Minshu-tō*) for 2021.

[9] The "third parties" camp changed for every election. In 2012, we included the JCP, the Japan Restoration Party (*Nippon Ishin no Kai*), Your Party (*Mina no Tō*), Tomorrow Party (*Mirai no Tō*) and Happiness Realization Party (*Kōfuku Jitsugen Tō*). In 2014, we included the JCP and the successor of the Restoration Party (also called *Nippon Ishin no Kai*). In 2017, we included the JCP, the Japan Innovation Party (also called *Nippon Ishin no Kai*) and the Party of Hope (*Kibō no Tō*). In 2021, we included the JCP, the Innovation Party, and *Reiwa Shinsengumi*. Noticeably, in 2021 the JCP, *Reiwa Shinsengumi* and the main opposition party (Constitutional Democratic Party of Japan, CDPJ) endorsed joint candidates in some SMD, which blurred the distinction between (main) opposition and the "third parties" camp.

[10] In July 2016, the minimum voting age in Japan was lowered from 20 to 18 years. Due to municipal data limitations, we had to proxy the group of eligible voters by selecting the demographic cohort of "17+" for the municipal elections of 2012, 2014 and 2017, and "15+" – for the 2021 elections. As a result, the official turnout numbers mentioned in Section 2 slightly differ from the ones presented in Table 2.

[11] Zero value for the median SMD-vote cast for the main opposition in 2017 is due to the fact that one of opposition parties that emerged from the split of the DPJ in the same year – the Democratic Party (*Minshintō*) – decided to forego the elections, leading to the abstention of numerous "main opposition" candidates. For the accurate figures for 2017 election, refer to the respective PR-districts' values (standing at the 19% median level).

PR-tier respectively. The median turnout rate is 56%, reflecting a modest recovery trend since the all-time low in 2014.

We then used information from the National Federation of Depopulating Regions (*Zenkoku Kaso Chiiki Renmei*) and the database of the Statistics Bureau of Japan (*e-stat*) to group the municipalities into the following categories: (1) "fully depopulating"/non-merged, (2) "fully depopulating"/merged, (3) partly depopulating, (4) "not depopulating"/merged, (5) "not depopulating"/non-merged. Notably, all special wards are part of the "not depopulating"/non-merged category, and all municipalities in the "partly depopulating" category were subject to the mid-2000s merger wave. The total number of municipalities designated as "depopulating" (all categories) rose from 771 in 2012 to 820 in 2021 due to ongoing population decline. Amid this overall increase, the number of "partly depopulating" municipalities decreased, while the number of merged municipalities recognized as "fully depopulating" increased. To account for these changes, we only used the status at the time of the respective elections (see Table A2).

Next, we attributed the electoral data to these different categories and aggregated the results. Importantly, we measured not only the absolute municipal values, but also municipal values *relative* to the respective single-member districts (SMDs) they are located in. Including relative values serves as an important robustness check for the distinct electoral profiles of each municipal category (see Section 5.1). Moreover, it reduces potential distortion of municipal-level results through district-level effects. For example, low turnout can be a district-level effect when the opposition does not field a competitive candidate, so voters may refrain from voting in a "dead" race.[12] The average number of municipalities per SMD is 6 for the election years of 2012 and 2014, and 7 for the election years of 2017 and 2021. Because the number of SMDs was reduced several times to correct for malapportionment, and the number of designated "depopulating municipalities" changed as well, the number of SMDs containing both "not depopulating" and "depopulating" municipalities varies for each election (126 in 2012, 123 in 2014, 119 in 2017 and 125 in 2021).[13]

Finally, we included several socio-economic control variables, such as taxable income per capita, and the share of primary-sector employment. According to Table A3, the median annual income per capita stands at 2.77 million Japanese yen. The median share of workforce occupied in the primary sector constitutes 7%. We also included variables such as "share of residents older than 65" (its median share increased sharply from 26% in 2012 to 34% in 2021), "fiscal strength" (median value is 0.47) and "LAT per capita" (median value is 163,000 Japanese yen) into the descriptive statistics, since they are key to capture the characteristics of our municipal types. Yet, we refrained from placing these variables into the list of our predictors due to the possibility of post-treatment bias (see Section 5.1).

5. Results

On the most basic level, we find that municipalities designated as "depopulating" (all categories) display disproportionally strong support for the LDP-led ruling coalition

[12] We thank the anonymous reviewer for raising this point.

[13] Some municipalities are split between different SMDs. Operating with panel data, we had to eliminate duplicate municipal observations for each election by merging electoral and socio-economic data on the municipal level. Where municipalities are divided between two or more SMDs, we only kept the most populated municipal district and attributed the respective electoral data to the whole municipality.

as well as significantly higher turnout rates compared to municipalities not designated as depopulating (Table 1). "Depopulating" municipalities also display weaker support for third parties. At first glance, these results suggest that interregional redistribution under the "Kaso Law" continues to stabilize electoral behavior in favor of the long-term ruling party, despite ongoing depopulation and economic dependency.

	Kaso (N = 3198)	**Non-Kaso** (N = 4379)
Ruling coalition (SMD)	0.57 (0.48, 0.67)	0.49 (0.41, 0.58)
Ruling coalition (PR)	0.52 (0.46, 0.57)	0.46 (0.41, 0.51)
Ruling coalition (SMD-PR gap)	0.07 (0.00, 0.13)	0.04 (-0.02, 0.10)
Turnout (SMD)	0.62 (0.56, 0.68)	0.53 (0.49, 0.58)
Fiscal strength	0.26 (0.18, 0.37)	0.70 (0.50, 0.87)
Third parties (SMD)	0.10 (0.04, 0.25)	0.19 (0.08, 0.38)
Third parties (PR)	0.21 (0.16, 0.29)	0.30 (0.22, 0.38)
Main opposition (SMD)	0.19 (0.00, 0.35)	0.22 (0.00, 0.37)
Main opposition (PR)	0.21 (0.16, 0.27)	0.21 (0.17, 0.26)
LAT per capita (1000 JPY)	335 (219, 534)	76 (27, 154)
Income per capita (1000 JPY)	2,548 (2,404, 2,721)	2,992 (2,741, 3,317)
Residents 65+	0.36 (0.32, 0.41)	0.27 (0.23, 0.30)
Primary-sector employment	0.15 (0.09, 0.23)	0.03 (0.01, 0.07)

[1] Median (Q1, Q3)

Table 1. Electoral profiles of "depopulating" (kaso, all categories) vs. "non-kaso" municipalities (sources: Ministry of Internal Affairs and Communications (MIC), National Federation of Depopulating Regions, Statistics Bureau of Japan)

However, once we break down the results to different categories of "depopulating" municipalities (Table 2), the picture becomes more nuanced. In short, the differences in electoral behavior between "depopulating" and "not depopulating" municipalities are to a large part due to the distinct electoral profile of "fully depopulating" municipalities, especially those that remained intact during the mid-2000s Heisei merger wave. In contrast, electoral behavior in "partly depopulating" municipalities is largely similar to municipalities not designated as depopulating. Importantly, the distinct features of "fully depopulating"/non-merged municipalities are evident both on the national level and when measured relative to the respective SMD-averages. As a first-cut analysis, the descriptive data thus already suggests that the combination of being designated as a "depopulating municipality" and remaining intact in the mid-2000s merger indeed produces relative electoral stability, expressed as a combination of high turnout, high LDP+Kōmeitō support, and low support for "third parties".

Yet, descriptive data alone is not sufficient to support this claim. The designation as "depopulating municipality" rests on a combination of various socio-demographic indicators, which include high aging rates and the above-mentioned "fiscal strength index". There are some notable correlations among these variables. For example, the Pearson coefficients reported in Table A4 show that municipalities with high aging rates also have a lower fiscal strength index ($r = -0.65$) and lower income per capita ($r = -0.51$) as well as higher turnout rates ($r = 0.51$). Turnout further correlates positively with LAT per capita ($r = 0.55$) and negatively ($r = -0.55$) – with fis-

cal strength.[14] Thus, aging and fiscal dependency are associated with higher turnout even without controlling for mergers or the designation as depopulating municipality. In the following sections, we use panel regressions to additionally control for other confounders and to statistically verify the differences between municipal types.

	Fully dep. (non-merged) (N = 1708)	**Fully dep. (merged)** (N = 895)	**Partly dep.** (N = 595)	**Non-Kaso (non-merged)** (N = 2860)	**Non-Kaso (merged)** (N = 1519)
Ruling coalition (SMD)	0.57 (0.48, 0.68)	0.59 (0.49, 0.70)	0.54 (0.45, 0.63)	0.49 (0.41, 0.58)	0.49 (0.41, 0.57)
Ruling coalition (PR)	0.52 (0.45, 0.59)	0.53 (0.48, 0.59)	0.49 (0.44, 0.54)	0.46 (0.41, 0.51)	0.45 (0.41, 0.50)
Ruling coalition (SMD-PR gap)	0.07 (0.02, 0.12)	0.07 (-0.01, 0.14)	0.06 (-0.01, 0.12)	0.04 (-0.02, 0.10)	0.04 (-0.01, 0.09)
Turnout (SMD)	0.66 (0.60, 0.71)	0.61 (0.56, 0.66)	0.54 (0.50, 0.60)	0.54 (0.49, 0.58)	0.52 (0.47, 0.56)
Fiscal strength	0.20 (0.15, 0.27)	0.28 (0.23, 0.34)	0.49 (0.41, 0.58)	0.66 (0.47, 0.85)	0.74 (0.59, 0.89)
Third parties (SMD)	0.09 (0.03, 0.22)	0.11 (0.05, 0.27)	0.14 (0.05, 0.28)	0.19 (0.08, 0.38)	0.20 (0.08, 0.39)
Third parties (PR)	0.20 (0.15, 0.27)	0.22 (0.16, 0.30)	0.26 (0.19, 0.33)	0.30 (0.22, 0.37)	0.30 (0.23, 0.39)
Main opposition (SMD)	0.20 (0.00, 0.37)	0.15 (0.00, 0.31)	0.21 (0.00, 0.36)	0.22 (0.00, 0.36)	0.21 (0.00, 0.38)
Main opposition (PR)	0.22 (0.16, 0.28)	0.20 (0.16, 0.25)	0.21 (0.18, 0.26)	0.21 (0.17, 0.26)	0.21 (0.17, 0.26)
LAT per capita (1000 JPY)	464 (304, 695)	313 (250, 415)	143 (110, 195)	69 (21, 135)	91 (36, 195)
Income per capita (1000 JPY)	2,520 (2,357, 2,708)	2,505 (2,396, 2,611)	2,720 (2,586, 2,857)	2,952 (2,706, 3,311)	3,069 (2,801, 3,317)
Residents 65+	0.38 (0.34, 0.42)	0.37 (0.34, 0.41)	0.30 (0.28, 0.33)	0.27 (0.23, 0.31)	0.26 (0.23, 0.29)
Primary-sector employment	0.19 (0.12, 0.28)	0.15 (0.10, 0.21)	0.07 (0.04, 0.10)	0.03 (0.01, 0.08)	0.03 (0.01, 0.06)

[1] Median (Q1, Q3)

Table 2. Electoral profiles of municipal types (sources: Ministry of Internal Affairs and Communications (MIC), National Federation of Depopulating Regions, Statistics Bureau of Japan)

5.1. *Panel regressions*

Because municipal boundaries do not replicate idiosyncratic regional effects, we refrain from introducing individual fixed effects and rely on the pooled ordinary least squares (OLS) model. In addition, since all the mergers except one[15] occurred prior to 2012 (the starting point of our analysis), this key explanatory dummy is a time-invariant variable, which is another reason why chose not to implement individual fixed effects. Yet, since each election has unique features, we introduce time fixed effects by including yearly dummies.

The full equation estimated on the period $t \in \{2012, 2014, 2017, 2021\}$ using OLS can be presented as follows:

$$ESt_{it} = \beta_0 + \beta_1 Income_{it} + \beta_2 MainOpp_{it} + \beta_3 PrEmpl_{it} + \beta_4 MType_{it} + Year_t + \epsilon_{it} \quad (1)$$

where ESt_{it} is the "electoral stability" variable that is composed of (1) "Turnout rate", (2) "Ruling coalition support" or (3) "Third parties' support" in a municipality i during the election year t as described in the Section 4.1. $Income_{it}$ stands for taxable income per capita (1000 JPY), $MainOpp_{it}$ – for the vote share of the main opposition in the PR-tier, $PrEmpl_{it}$ – for the share of employment in the primary sector, and $MType_{it}$ – for the municipal type, which represents the combination of being designated as "fully", "partly", or "not depopulating" together with merger status (see the detailed explanation in the Section 4.1). $Year_t$ denotes the effects of the general elections for the given year, while ϵ_{it} stands for the noise of the model. In addition to implementing the OLS model, we assume the existence of random unobserved heterogeneity varying for municipal units from election to election. Whilst expecting that this heterogeneity is not correlated with the explanatory variables included into the regressions, the "Random effects" model allows for the possibility of such correlation.

[14] We included "Residents 65+", "Fiscal strength" and "LAT per capita" into descriptive statistics, but not into regressions due the possibility of post-treatment bias, as discussed in Section 5.1.

[15] In 2014, Iwafune (Tochigi Prefecture) was absorbed by Tochigi City.

Since "Random effects" are considered more efficient than OLS in removing serial correlation, we build our explanation on this model (Wooldridge 2010).

As mentioned in Section 3.1, the designation as "depopulating municipality" is based on various socio-demographic indicators. Thus, including variables related to the "depopulating municipality" status into our analysis can potentially produce multicollinearity and post-treatment bias. As seen from the Table A4, along with our expectations, "Income per capita" and "Primary-sector employment" have a significantly low Pearson correlation coefficient ($r = -0.42$). However, VIF (variance inflation factor) and tolerance (1/VIF) presented in the Table A5 suggest that multicollinearity is not a concern for our model. Regarding post-treatment bias, it is important to account for the contextual links between the variables. On one hand, "Municipal type" itself is influenced by the range of socio-economic predictors such as "Income per capita" and "Primary-sector employment", but not the other way round. In other words, in our model, these predictors are exogenous. Additionally, although they are not among the official criteria for designating municipalities as "depopulating", these independent variables are important compositional factors that characterize "depopulating municipalities". Hence, including "Income per capita" and "Primary-sector employment" enables us to interpret the "Municipal type" coefficients as a contextual factor, and serves as a remedy for avoiding omitted variable bias (King 2010, slide 7). On the other hand, the designation as "depopulating municipality" impacts redistribution patterns such as the amount of LAT per capita, which, in turn, affects electoral variables such as turnout and support for the ruling coalition. Based on this causal chain, we refrain from including "LAT per capita" into the list of covariates due to the high likelihood of encountering post-treatment bias. We also excluded "Fiscal strength" and "Residents 65+" from the regression. As mentioned in Section 3.1, these variables are the key criteria to designate municipalities as "depopulating". Therefore, by accounting for either or both "Fiscal strength" and "Residents 65+" together with "Municipal type", we would repeatedly control for the status of "depopulating municipality" within the same model, which would distort our regression coefficients.

Dealing with geographical data further entails possible interdependence between observation units. As presented in Figure 2, turnout across Japan's municipalities suggest strong *spatial autocorrelation*. Significant ($p < 0.001$) Moran's I statistic of 0.51 prompts us to reject the null hypothesis of spatial randomness in our data set. In other words, neighboring municipalities are likely to share high (low) turnout levels. This also holds true for other dependent electoral variables. Because such contiguity would violate the underlying assumption about the independence of observations, we conducted a locally robust panel Lagrange Multiplier (LM) test for spatial dependence (Anselin et al. 1996). This test assists with choosing between the spatial autoregressive (SAR) and the spatial error (SEM) models. While SAR models are based on the spatially lagged dependent variable, spatial interaction in SEM models reflects the spatially lagged error term (Salima, Le Gallo, and Vedrine 2018). The LM test provided evidence in favor of implementing the SEM model ($LM = 88$ for the "Turnout" model, $LM = 39$ for the "Ruling coalition" model, all significant at 1%-level) rather than the SAR model ($LM = 48$ for the "Turnout" model, $LM = 18$ for the "Ruling coalition" model, all significant at 1%-level). Only for the "Third parties" model, SAR specification ($LM = 54$, significant at 1%-level) appears to be preferable to SEM ($LM = 12$, significant at 1%-level). Yet, due to the significance of spatial error, we chose to implement the SEM model for internal consistency (we used `splm` R package developed by Millo and Piras 2012). Another advantage of using the SEM model is that we can interpret its coefficients similarly to a normal linear model (Floch and

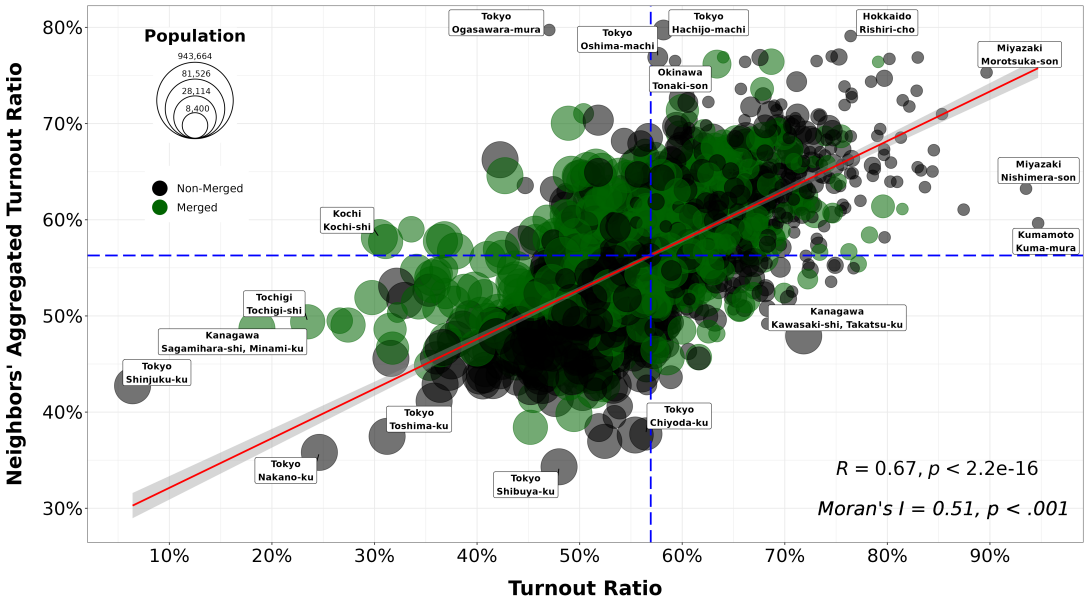

Figure 2. Turnout ratio: Moran scatterplot of contiguous neighbors (2021)

Le Saout 2018).

Table 3 shows the results of the panel regressions. To reiterate, we focus on three dependent variables (turnout, support for the ruling coalition, and support for "third parties"), assuming that a combination of high turnout, high support for the ruling coalition, and low support for "third parties" signals relative electoral stability. Here, we only report the values relative to the SMD-average, which we consider to be more robust. In short, the regressions confirm the distinct electoral profile of "fully depopulating"/non-merged municipalities and additionally reveal interesting details pertaining to the other types.

Regarding turnout, as expected, primary-sector employment is among the strongest predictors. A 10-percentage-point increase in the share of employed in this sector of economy is associated with 3.7-percentage-point increase in municipal-level turnout relative to the respective SMD-average when holding other predictors fixed. In line with our expectations, we also find that electoral competition is associated with higher turnout: A 10-percentage-point increase in support for the "main opposition" camp corresponds to turnout growing by 0.6 percentage-points. Additionally, higher voter turnout is registered in municipalities with lower taxable income per capita. The most interesting finding regards differences between municipal types: *Only* "fully depopulating"/non-merged municipalities register higher turnout than municipalities not designated as "depopulating". Strikingly, "partly depopulating" municipalities – although having higher aging rates than municipalities not designated as "depopulating" (see Table 2) – have lower turnout rates than "not depopulating"/non-merged municipalities when controlling for other regression variables. This is a peculiar trend that we can only explain when we account for both contextual factors (mergers and status as "depopulating" municipality) and compositional factors (share of primary-sector employment and income per capita). We will return to this issue in the discussion section.

Regarding support for the ruling coalition, primary-sector employment is also a strong predictor. Reflecting a lasting conservative orientation of the "farm vote",

a 10-percentage-point larger share of employed in this sector is associated with 4-percentage-point increase in electoral support for ruling coalition (LDP+Kōmeitō). Moreover, similarly to voter turnout, candidates from the ruling coalition receive more votes in municipalities with lower taxable income per capita. Furthermore, once again we find that support for the ruling coalition is most pronounced in "fully depopulating" municipalities, which yield 0.06-percentage-point more votes for the LDP+Kōmeitō camp in case of non-merged units and 0.08-percentage-point more votes in case of merged units, compared to municipalities not designated as "depopulating" when keeping other variables fixed.

Electoral support for "third parties" completes the picture: "Fully depopulating"/non-merged municipalities display lower support for the "third parties" camp compared to "not depopulating"/non-merged municipalities. Support for third parties is also lower in "partly depopulating" municipalities. Finally, as opposed to the previously discussed models, primary-sector employment has a reverse (negative) effect, while taxable income per capita has a positive effect, suggesting that voters in economically more developed municipalities are more likely to support "third parties".

In sum, when we control for other electoral and socio-economic covariates, the group of "fully depopulating"/non-merged municipalities consistently stands out as a robust predictor for relative electoral stability, marked by the combination of high turnout, strong support for the ruling coalition, and low support for "third parties". As expected, we cannot solely attribute this to being designated as a "fully depopulating" municipality under the "Kaso Law". Rather, our analysis confirms that relative electoral stability results from a combination of the designation as "depopulating", remaining intact during the Heisei merger wave, as well as high primary-sector employment and low taxable income per capita.

	Turnout		Ruling coalition		Third parties	
	(1)	(2)	(1)	(2)	(1)	(2)
(Intercept)	**0.96*****	**0.95*****	**1.11*****	**1.05*****	**1.12*****	**1.12*****
	(0.01)	(0.014)	(0.03)	(0.04)	(0.09)	(0.1)
Year dummy (base = "2012")						
2014	**−0.07*****	**−0.06*****	**0.07*****	**0.07*****	**−0.35*****	**−0.30*****
	(0.00)	(0.01)	(0.01)	(0.02)	(0.02)	(0.08)
2017	**−0.03*****	**−0.03*****	**0.06*****	**0.05***	**0.34*****	**0.44*****
	(0.00)	(0.01)	(0.01)	(0.02)	(0.02)	(0.08)
2021	**−0.03*****	**−0.03*****	**0.09*****	**0.08*****	**−0.91*****	**−0.84*****
	(0.00)	(0.01)	(0.01)	(0.02)	(0.03)	(0.08)
Taxable income per capita (1000 JPY)	**−0.01*****	**−0.01*****	**−0.01*****	**−0.01*****	**0.01*****	**0.01*****
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Main opposition	**0.06*****	0.03				
	(0.02)	(0.02)				
Primary-sector employment	**0.37*****	**0.44*****	**0.40*****	**0.33*****	**−1.48*****	**−0.60*****
	(0.03)	(0.03)	(0.06)	(0.05)	(0.18)	(0.13)
Municipal type (base = "Non-Kaso (non-merged)")						
Non-Kaso (merged)	**−0.05*****	**−0.05*****	0.00	−0.00	−0.01	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.03)
Fully depopulating (non-merged)	**0.08*****	**0.04*****	**0.06*****	**0.04*****	**−0.17*****	**−0.09*****
	(0.01)	(0.01)	(0.02)	(0.01)	(0.04)	(0.03)
Fully depopulating (merged)	**0.02****	−0.01	**0.08*****	0.00	−0.07	−0.05
	(0.01)	(0.01)	(0.02)	(0.01)	(0.05)	(0.03)
Partly depopulating	**−0.03*****	**−0.05*****	**0.04***	−0.02	**−0.16****	−0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.05)	(0.03)
Spatial error (SE) coefficient λ		**0.60*****		**0.80*****		**0.80*****
		(0.01)		(0.01)		(0.01)
R^2	0.25	0.34	0.06	0.08	0.29	0.23
Adj. R^2	0.25		0.06		0.28	
Num. obs.	7549	7508	7560	7524	7560	7524

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 3. Electoral stability: random effects models (dependent variables' are relative to the respective SMDs' averages)

6. Discussion

The differences we find between various types of municipalities have several important implications for a more nuanced understanding of the relationship between regional decline and electoral behavior in Japan. Most importantly, they point us to how compositional and contextual factors interact to affect turnout and support for the ruling coalition in "depopulating municipalities".

We argue that relative electoral stability in "fully depopulating"/non-merged municipalities can be explained by a specific constellation of compositional and contextual factors. Long-term outmigration of younger residents means that "fully depopulating"/non-merged municipalities not only have by far the highest aging rates, but the remaining population is also more likely to be employed in the primary sector – a combination of compositional factors that significantly increases both turnout and support for the LDP-led coalition. Contextual factors add to this effect: In "fully depopulating"/non-merged municipalities, historically grown social ties between local politicians, residents, and national politicians remained intact in the mid-2000s merger wave. In line with earlier studies, we can expected stable socio-spatial boundaries to benefit turnout and LDP support. Notably, we find the combination of higher turnout and stronger support for the ruling coalition *only* in municipalities that remained in-

tact *and* are designated as "fully depopulating" – i.e., the *kaso* status amplifies the electoral effects of remaining intact in the mid-2000s merger wave. Arguably, in "fully depopulating"/non-merged municipalities, long-term demographic decline remained directly tied to additional fiscal support under the "Kaso Law". These funds have been mainly used for infrastructural projects, which have long been associated with clientelist networks between rural voters and LDP politicians (Matanle, Rausch, and The Shrinking Regions Research Group 2011; Horiuchi, Saito, and Yamada 2015). The combination of these factors explains why the municipalities most drastically affected by aging, depopulation, and economic dependency are not "left behind" politically, but instead are not only more likely to support the LDP-led coalition, but also more likely to participate in elections.

The situation in "partly depopulating" municipalities is markedly different but follows a similar logic. To reiterate, we found that "partly depopulating" municipalities register *lower* turnout rates than "not depopulating"/non-merged municipalities. This is striking, because "partly depopulating" municipalities have *higher* aging rates, i.e., a compositional factor that correlates strongly with higher turnout. Noticeably, the differences between "fully" and "partly depopulating" municipalities are more pronounced for turnout than for LDP+Kōmeitō support. Relative to "not depopulating"/non-merged municipalities, "partly depopulating" municipalities still register stronger support for the ruling coalition. Again, we cannot solely link this peculiar pattern to the status as a "partly depopulating" municipality. Rather, we argue that it is also best explained by considering the combined effects of compositional and contextual factors: While higher support for the conservative coalition in "partly depopulating" municipalities is a compositional effect of higher aging rates and primary-sector employment, relatively low turnout ratios are a contextual effect of the disruption in the Heisei municipal mergers.

The latter seems to have lasting negative affect electoral mobilization in aging peripheries. In general, although older voters are more likely to vote, turnout decreases sharply above the age of 75. Media reports refer to this phenomenon as a "*kaso* problem", caused by decreasing mobility and a lack of access to polling stations in depopulating areas.[16] In rural Ishikawa Prefecture, for example, the number of polling stations was reduced from 525 in the 2012 election to 434 in the 2021 election.[17] However, our analysis shows that this "*kaso* problem" does not affect "fully depopulating"/non-merged municipalities, where the highest aging rates consistently produce the highest turnout. Rather, it seems to be restricted to "partly depopulating" municipalities – i.e., places in which rapidly aging "depopulating" former towns and villages were pushed to the peripheries of larger, more heterogeneous municipalities in the mid-2000s merger wave.

Taken together, our findings shed light on the long-term political and electoral consequences of the mid-2000s merger wave, and confirm that the LDP took a well-calculated risk when pushing for these mergers. The mergers "untethered" former rural towns and villages from national politics (Yamada 2021). This has negative effects for the political representation of rapidly aging rural peripheries, but (so far) not for the LDP, which managed to reorient its platform towards the "median" (i.e., urban) voter, while still benefiting from disproportionally strong support in "fully depopulating"/non-merged municipalities. In this sense, the rural periph-

[16] See Kohara (2019) for decreasing turnout in *kaso* areas in Upper House elections between 2007 and 2016; see Ikeda (2021) for decreasing turnout among the very old in *kaso* areas in Lower House elections in 2017 and 2021.

[17] See Oshikawa (2021).

eries of "partly depopulating" municipalities are indeed "places that don't matter" (Rodríguez-Pose 2018) – but the risk of an "electoral revenge" from these areas is limited for the LDP, and the prospects for any other party to mobilize them against the LDP are equally small.

7. Conclusion

Recently, the literature on the electoral effects of regional decline has been dominated by the objective to explain right-wing populist surges in Europe and the US. In contrast, the case of Japan's "depopulating regions" shifts the attention to how certain compositional and contextual factors moderate the electoral effects of long-term demographic decline and economic dependency in ways that benefit the conservative establishment. Specifically, our results show that compositional effects of long-term demographic decline (esp. high aging rates) interact with the municipal designation as a "depopulating region" and relatively stable socio-spatial boundaries to produce relative electoral stability expressed in high turnout rates, high support for the ruling conservative coalition, and low support for "third parties".

Noticeably, we do not consider Japan as an outlier – rather, we find strong parallels between electoral stability in Japan's "fully depopulating"/non-merged municipalities and "frozen political allegiances" in depopulating municipalities in Spain, where the combined effects of high aging rates in relatively small municipalities also benefit the main conservative party (Sanchez-Garcia, Rodon, and Delgado-Garcia 2024). We may even extend this argument to "tightly-knit" rural communities in the US, where the combination of long-term demographic decline and high levels of strong social bonds ("social capital") among remaining residents has been linked to higher levels of support for the candidate of the Republican Party – although this candidate was the self-proclaimed "anti-establishment" Donald Trump (Rodríguez-Pose, Lee, and Lipp 2021). Obvious differences in political culture and electoral systems aside, the underlying mechanisms reproducing electoral support for conservative LDP candidates in Japan's "fully depopulating"/non-merged municipalities appear to be strikingly similar.

Given the significance of stable socio-spatial boundaries for the distinct electoral profile of "fully depopulating"/non-merged municipalities, future research on the electoral effects of depopulation should pay more attention to how changes in relative municipal size (and the corresponding retreat of the state from declining regions) affect both turnout and political allegiances – and if and under what conditions such changes favor anti-establishment challengers or established conservative parties. Secondly, and closely related, we argue that the electoral effects of place-based support programs must be analyzed in context. By themselves, such policies may neither "solve" the issue of regional decline nor benefit a certain party – but under certain circumstances, their allocation can reproduce clientelist networks between established (conservative) candidates and those groups who are more prone to "stay put" (e.g., farmers, construction, older residents, etc.). Our results suggest that stable socio-spatial boundaries amplify this effect. Consequently, we argue that the interrelation between place-based policies, relative municipal size, and electoral behavior in regions facing long-term decline offers a promising angle for further comparative research.

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Appendix A. Supplementary summary tables

	Rural (N = 72)	**Semi-rural** (N = 72)	**Semi-urban** (N = 72)	**Urban** (N = 73)
Ruling coalition (SMD)	0.53 (0.47, 0.63)	0.52 (0.45, 0.56)	0.45 (0.41, 0.50)	0.40 (0.37, 0.45)
Ruling coalition (PR)	0.50 (0.46, 0.53)	0.47 (0.45, 0.51)	0.42 (0.40, 0.45)	0.39 (0.37, 0.41)
Ruling coalition (SMD-PR gap)	0.05 (-0.01, 0.11)	0.04 (-0.01, 0.09)	0.03 (0.00, 0.07)	0.02 (-0.03, 0.07)
Turnout (SMD)	0.63 (0.59, 0.66)	0.58 (0.55, 0.61)	0.54 (0.51, 0.56)	0.51 (0.48, 0.54)
Fiscal strength	0.36 (0.29, 0.48)	0.59 (0.48, 0.71)	0.84 (0.75, 0.94)	0.81 (0.71, 0.97)
Third parties (SMD)	0.14 (0.09, 0.20)	0.16 (0.10, 0.21)	0.20 (0.17, 0.27)	0.26 (0.19, 0.33)
Third parties (PR)	0.22 (0.19, 0.24)	0.23 (0.21, 0.26)	0.27 (0.24, 0.29)	0.31 (0.29, 0.37)
Main opposition (SMD)	0.20 (0.15, 0.32)	0.26 (0.17, 0.34)	0.28 (0.22, 0.35)	0.26 (0.19, 0.36)
Main opposition (PR)	0.24 (0.22, 0.29)	0.25 (0.22, 0.28)	0.26 (0.23, 0.29)	0.25 (0.21, 0.28)
LAT per capita (1000 JPY)	282 (219, 377)	133 (80, 225)	33 (19, 67)	7 (2, 160)
Income per capita (1000 JPY)	2,602 (2,489, 2,766)	2,838 (2,694, 2,992)	3,240 (3,071, 3,443)	3,613 (3,378, 4,022)
Residents 65+	0.34 (0.31, 0.35)	0.29 (0.26, 0.32)	0.25 (0.23, 0.27)	0.22 (0.20, 0.25)
Primary-sector employment	0.14 (0.09, 0.19)	0.07 (0.04, 0.10)	0.02 (0.01, 0.03)	0.00 (0.00, 0.01)

[1] Median (Q1, Q3)

Table A1. Electoral profiles of "rural" vs. "urban" SMDs that remained intact throughout the years 2012–2021 (sources: Ministry of Internal Affairs and Communications (MIC), National Federation of Depopulating Regions, Statistics Bureau of Japan). Note: SMD = "single-member district", PR = "proportional representation", LAT = "Local Allocation Tax", JPY = "Japanese yen"

	Municipal type			
	Fully dep.	Non-Kaso	Partly dep.	Total
2012				
Non-Merged	405 (21%)	0 (0%)	NA	1,142 (60%)
Merged	210 (11%)	156 (8.2%)	387 (20%)	753 (40%)
Total	615 (32%)	156 (8.2%)	1,124 (59%)	1,895 (100%)
2014				
Non-Merged	424 (22%)	0 (0%)	NA	1,142 (60%)
Merged	221 (12%)	148 (7.8%)	383 (20%)	752 (40%)
Total	645 (34%)	148 (7.8%)	1,101 (58%)	1,894 (100%)
2017				
Non-Merged	442 (23%)	0 (0%)	NA	1,142 (60%)
Merged	230 (12%)	142 (7.5%)	380 (20%)	752 (40%)
Total	672 (35%)	142 (7.5%)	1,080 (57%)	1,894 (100%)
2021				
Non-Merged	437 (23%)	0 (0%)	NA	1,142 (60%)
Merged	234 (12%)	149 (7.9%)	369 (19%)	752 (40%)
Total	671 (35%)	149 (7.9%)	1,074 (57%)	1,894 (100%)

Table A2. Merged / non-merged counts and proportions across kaso-types

	GVIF	Df	1/VIF
Year	1.345	1.732	1.051
Taxable income per capita (1000 JPY)	1.155	1.000	1.075
Main opposition	1.256	1.000	1.121
Primary-sector employment	1.182	1.000	1.087
Municipal type	1.167	2.000	1.019

Table A5. Variance inflation factors (VIF) for the regression model with "Turnout rate" as a dependent variable

Appendix B. "Depopulating regions" (*kaso chiiki*): definitions and categories

The first iteration of the "Kaso Law" was introduced in 1970, then called 過疎地域対策緊急措置法 (*Kaso chiiki taisaku kinkyû sochi hô*, Law Concerning Emergency Measures for Depopulating Areas). It was then periodically renewed and/or revised as follows:

- 1980: 過疎地域振興特別措置法 (*Kaso chiiki shinkô tokubetsu sochi hô*, Law Concerning Special Measures for the Promotion of Depopulating Regions)
- 1990: 過疎地域活性化特別措置法 (*Kaso chiiki kasseika tokubetsu sochi hô*, Law

	2012 (N = 1895)	**2014** (N = 1894)	**2017** (N = 1894)	**2021** (N = 1894)	**Overall** (N = 7577)
Turnout (SMD)					
N	1,895	1,887	1,885	1,888	7,555
Median (IQR)	0.58 (0.54, 0.63)	0.54 (0.48, 0.60)	0.56 (0.51, 0.63)	0.56 (0.51, 0.63)	0.56 (0.51, 0.63)
Min ˜ Max	0.07 ˜ 0.87	0.14 ˜ 0.99	0.13 ˜ 0.97	0.06 ˜ 0.95	0.06 ˜ 0.99
Residents 65+					
N	1,890	1,890	1,890	1,894	7,564
Median (IQR)	0.26 (0.22, 0.32)	0.30 (0.26, 0.36)	0.30 (0.26, 0.36)	0.34 (0.29, 0.39)	0.30 (0.25, 0.36)
Min ˜ Max	0.09 ˜ 0.57	0.13 ˜ 1.00	0.13 ˜ 1.00	0.15 ˜ 0.65	0.09 ˜ 1.00
Fiscal strength					
N	1,895	1,894	1,894	1,894	7,577
Median (IQR)	0.47 (0.27, 0.74)	0.47 (0.27, 0.76)	0.48 (0.29, 0.76)	0.47 (0.28, 0.74)	0.47 (0.28, 0.75)
Min ˜ Max	0.05 ˜ 2.13	0.05 ˜ 2.07	0.06 ˜ 2.15	0.06 ˜ 2.10	0.05 ˜ 2.15
Ruling coalition (SMD)					
N	1,895	1,894	1,894	1,894	7,577
Median (IQR)	0.49 (0.39, 0.60)	0.52 (0.44, 0.63)	0.52 (0.45, 0.62)	0.54 (0.46, 0.65)	0.52 (0.43, 0.62)
Min ˜ Max	0.00 ˜ 0.91	0.00 ˜ 0.94	0.00 ˜ 0.91	0.00 ˜ 0.90	0.00 ˜ 0.94
Ruling coalition (PR)					
N	1,895	1,894	1,894	1,894	7,577
Median (IQR)	0.43 (0.37, 0.48)	0.49 (0.44, 0.55)	0.48 (0.43, 0.53)	0.52 (0.47, 0.57)	0.48 (0.42, 0.54)
Min ˜ Max	0.00 ˜ 0.78	0.00 ˜ 0.80	0.00 ˜ 0.78	0.00 ˜ 0.84	0.00 ˜ 0.84
Ruling coalition (SMD-PR gap)					
N	1,895	1,894	1,894	1,894	7,577
Median (IQR)	0.07 (0.01, 0.13)	0.04 (-0.01, 0.10)	0.06 (-0.01, 0.11)	0.04 (-0.03, 0.10)	0.05 (-0.01, 0.11)
Min ˜ Max	-0.61 ˜ 0.44	-0.64 ˜ 0.55	-0.63 ˜ 0.62	-0.69 ˜ 0.48	-0.69 ˜ 0.62
Main opposition (SMD)					
N	1,895	1,894	1,894	1,894	7,577
Median (IQR)	0.22 (0.12, 0.31)	0.26 (0.00, 0.38)	0.00 (0.00, 0.03)	0.34 (0.19, 0.45)	0.21 (0.00, 0.36)
Min ˜ Max	0.00 ˜ 0.79	0.00 ˜ 0.73	0.00 ˜ 0.72	0.00 ˜ 0.72	0.00 ˜ 0.79
Main opposition (PR)					
N	1,895	1,894	1,894	1,894	7,577
Median (IQR)	0.18 (0.15, 0.22)	0.21 (0.17, 0.27)	0.19 (0.16, 0.23)	0.27 (0.22, 0.31)	0.21 (0.17, 0.26)
Min ˜ Max	0.00 ˜ 0.45	0.00 ˜ 0.53	0.00 ˜ 0.51	0.00 ˜ 0.50	0.00 ˜ 0.53
Third parties (SMD)					
N	1,895	1,894	1,894	1,894	7,577
Median (IQR)	0.22 (0.10, 0.35)	0.12 (0.08, 0.23)	0.33 (0.11, 0.48)	0.00 (0.00, 0.12)	0.14 (0.06, 0.34)
Min ˜ Max	0.01 ˜ 0.85	0.00 ˜ 0.78	0.00 ˜ 0.90	0.00 ˜ 0.70	0.00 ˜ 0.90
Third parties (PR)					
N	1,895	1,894	1,894	1,894	7,577
Median (IQR)	0.36 (0.29, 0.42)	0.22 (0.18, 0.28)	0.30 (0.26, 0.34)	0.18 (0.15, 0.23)	0.27 (0.19, 0.34)
Min ˜ Max	0.00 ˜ 0.59	0.00 ˜ 0.54	0.00 ˜ 0.56	0.00 ˜ 0.59	0.00 ˜ 0.59
Income per capita					
N	1,894	1,894	1,894	1,894	7,576
Median (IQR)	2,713 (2,477, 3,040)	2,721 (2,489, 3,059)	2,790 (2,557, 3,136)	2,851 (2,600, 3,200)	2,769 (2,531, 3,115)
Min ˜ Max	1,921 ˜ 9,037	1,939 ˜ 12,667	1,970 ˜ 11,151	2,119 ˜ 11,632	1,921 ˜ 12,667
LAT per capita					
N	1,890	1,890	1,890	1,893	7,563
Median (IQR)	161 (60, 328)	165 (59, 344)	161 (57, 329)	167 (57, 355)	163 (59, 339)
Min ˜ Max	0 ˜ 2,766	0 ˜ 74,524	0 ˜ 127,334	0 ˜ 4,820	0 ˜ 127,334
Primary-sector employment					
N	1,890	1,889	1,889	1,893	7,561
Median (IQR)	0.07 (0.02, 0.16)	0.07 (0.02, 0.15)	0.07 (0.02, 0.15)	0.06 (0.02, 0.14)	0.07 (0.02, 0.15)
Min ˜ Max	0.00 ˜ 0.76	0.00 ˜ 0.77	0.00 ˜ 0.77	0.00 ˜ 0.76	0.00 ˜ 0.77

Table A3. Summary statistics

	1	2	3	4	5	6	7	8	9	10	11	12
1. Turnout (SMD)												
2. Residents 65+	0.51***											
3. Fiscal strength	-0.55***	-0.65***										
4. Ruling coalition (SMD)	0.10***	0.29***	-0.25***									
5. Ruling coalition (PR)	0.19***	0.47***	-0.31***	0.57***								
6. Ruling coalition (SMD-PR gap)	-0.02	0.02*	-0.09***	0.81***	-0.01							
7. Main opposition (SMD)	0.04***	-0.02	0.05***	-0.21***	-0.18***	-0.12***						
8. Main opposition (PR)	0.06***	0.12***	-0.01	-0.17***	-0.04***	-0.18***	0.66***					
9. Third parties (SMD)	-0.19***	-0.25***	0.21***	-0.22***	-0.36***	-0.01	-0.57***	-0.50***				
10. Third parties (PR)	-0.24***	-0.47***	0.33***	-0.35***	-0.55***	-0.04**	-0.30***	-0.47***	0.66***			
11. Income per capita (1000 JPY)	-0.34***	-0.51***	0.55***	-0.25***	-0.31***	-0.08***	0.10***	0.04***	0.16***	0.26***		
12. LAT per capita (1000 JPY)	0.55***	0.20***	-0.11***	0.03**	0.04***	0.01	-0.01	0.01	-0.03**	-0.05***	-0.03*	
13. Primary-sector employment	0.49***	0.50***	-0.64***	0.24***	0.28***	0.09***	-0.02	0.04***	-0.21***	-0.34***	-0.42***	0.11***

Note: $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table A4. Pearson Correlation Matrix

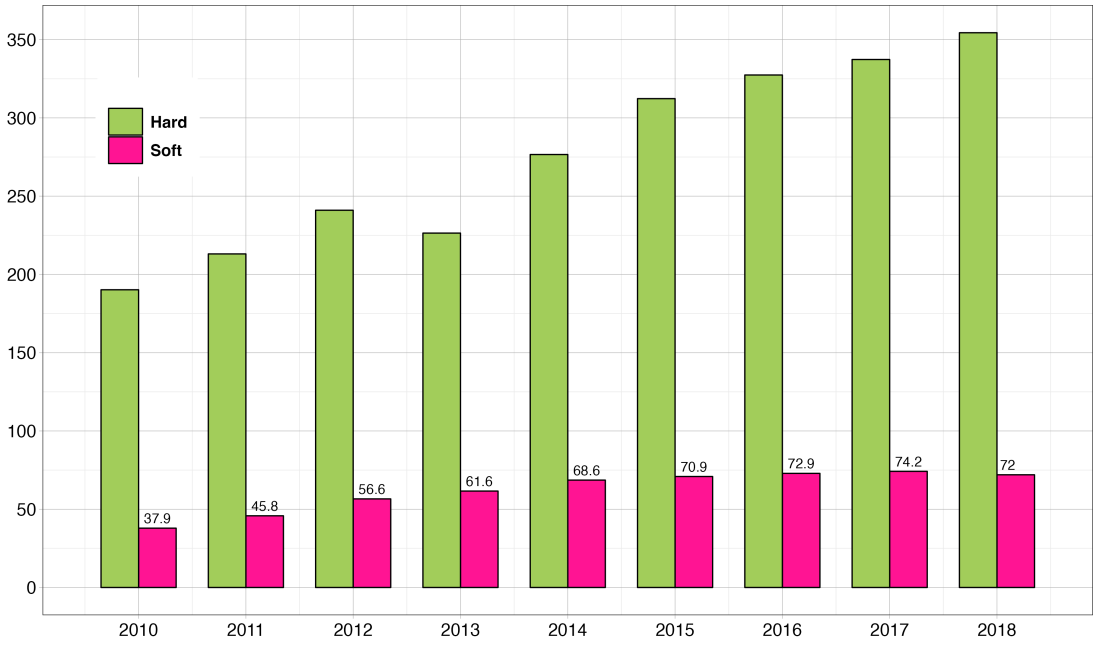

Figure B1. Changes in volume of kaso bonds (billion yen). Source: MIC 2020

Concerning Special Measures for the Revitalization of Depopulating Regions)

- 2000: 過疎地域自立促進特別措置法 (*Kaso chiiki jiritsu sokushin tokubetsu sochi hô*, Law Concerning Special Measures for the Promotion of Self-Reliance in Depopulating Regions)

This version of the law was revised and extended several times, which entailed changes such as adjustments to the eligibility criteria (see Figure B3) and the introduction of new categories in the aftermath of the mid-2000s Heisei merger wave (see Figure B4). Another notable change was the expansion of "*kaso* bonds", which since a revision in 2010 can be used not only for infrastructural ("hard") projects, but also for "soft" projects such as community building (see Figure B1).

- 2021: 過疎地域の持続的発展の支援に関する特別措置法 (*Kaso chiiki no jizokuteki hatten no shien ni kan suru tokubetsu sochi hô*, Law Regarding Special Measures Concerning Support for the Sustainable Development of Depopulating Regions)

Sources:

- MIC. 2020. "Kaso taisaku no gaiyô [Outline of Depopulation Countermeasures]." *Ministry of Internal Affairs and Communications*. Accessed on 12/2/2021. `https://www.soumu.go.jp/main_content/000694962.pdf`.
- MIC. 2021. "Kaso chiiki no jizokuteki hatten no shien ni kan suru tokubetsu sochi hô [Law Regarding Special Measures Concerning Support for the Sustainable Development of De-populating Regions]." *Ministry of Internal Affairs and Communications*. Accessed on 9/1/2024. `https://www.soumu.go.jp/main_content/000807173.pdf`.

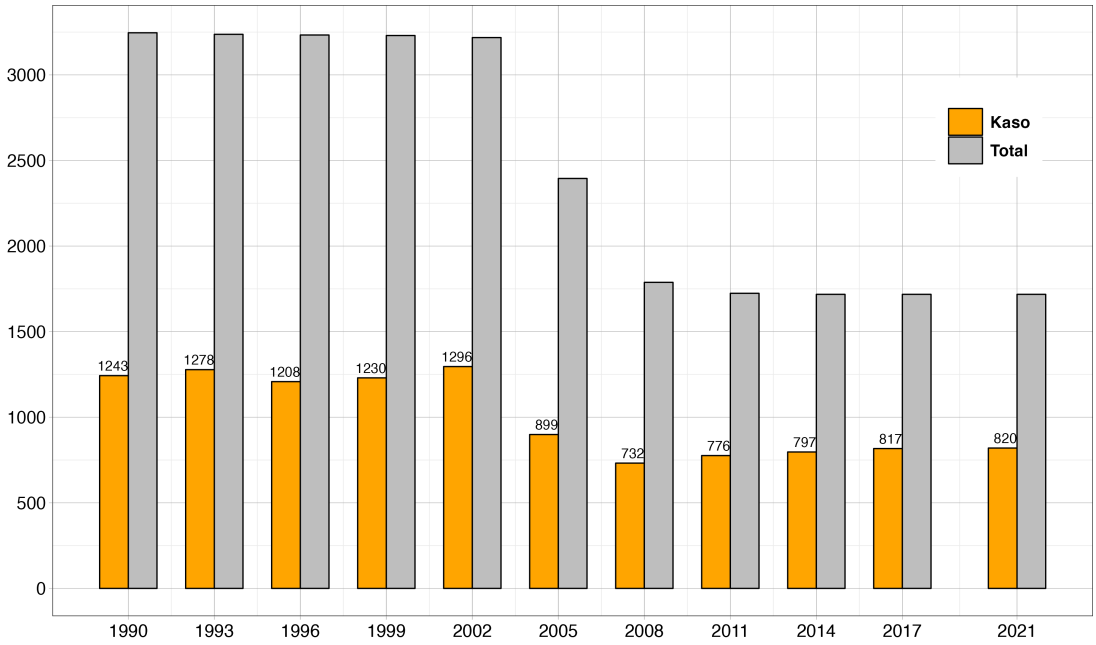

Figure B2. Number of total- and *kaso*-municipalities. Source: kaso-net.or.jp

		Requirements based on the 2000 Kaso Law		Requirements after the 2010 revision	Requirements after the 2014 revision	Requirements after the 2017 revision
		1. (based on 1995 census)	2. (based on 2000 census)	3. (based on 2005 census)	4. (based on 2010 census)	5. (based on 2015 census)
Population	Long-term requirements	Population decline of 30% or higher over a period of 35 years (1960-1995) or (Population decline of 25% or higher over a period of 35 years (1960-1995) and Aging rate of 24% or higher in 1995 or Share of young people of 15% or lower in 1995) *) Municipalities with population growth rates of 10% or higher over a period of 25 years are excluded (1970-1995)	Population decline of 30% or higher over a period of 35 years (1965-2000) or (Population decline of 25% or higher over a period of 35 years (1965-2000) and Aging rate of 24% or higher in 2000 or Share of young people of 15% or lower in 2000) *) Municipalities with population growth rates of 10% or higher over a period of 25 years are excluded (1975-2000)	Population decline of 33% or higher over a period of 45 years (1960-2005) or (Population decline of 28% or higher over a period of 45 years (1960-2005) and Aging rate of 29% or higher in 2005 or Share of young people of 14% or lower in 2005) *) Municipalities with population growth rates of 10% or higher over a period of 25 years are excluded (1980-2005)	Population decline of 33% or higher over a period of 45 years (1965-2010) or (Population decline of 28% or higher over a period of 45 years (1965-2010) and Aging rate of 32% or higher in 2010 or Share of young people of 12% or lower in 2010) *) Municipalities with population growth rates of 10% or higher over a period of 25 years are excluded (1985-2010)	Population decline of 32% or higher over a period of 45 years (1970-2015) or (Population decline of 27% or higher over a period of 45 years (1970-2015) and Aging rate of 36% or higher in 2015 or Share of young people of 11% or lower in 2015) *) Municipalities with population growth rates of 10% or higher over a period of 25 years are excluded (1990-2015)
	Medium-term Requirements	Population decline of 19% or higher over a period of 25 years (1970-1995)	Population decline of 19% or higher over a period of 25 years (1975-2000)	Population decline of 17% or higher over a period of 25 years (1980-2005)	Population decline of 19% or higher over a period of 25 years (1985-2010)	Population decline of 21% or higher over a period of 25 years (1990-2015)
Economic strength	Fiscal strength index	0.42 or less (3-year average, 1996-1998)	0.42 or less (3-year average, 1998-2000)	0.56 or less (3-year average, 2006-2008)	0.49 or less (3-year average, 2010-2012)	0.5 or less (3-year average, 2013-2015)
	Revenue from government-controlled gambling	less than 1.3 billion Yen	less than 1.3 billion Yen	less than 2 billion Yen	less than 4 billion Yen	less than 4 billion Yen

*) For population decline, either long-term or medium-term requirements need to be fulfilled. For economic strength, both fiscal strength index and limits regarding revenue from government-controlled gambling need to be fulfilled.
*) Elderly people include persons of 65 years of age or older, young people range from 15-29 years of age.

Figure B3. Criteria for classifying regions as "depopulating" (kaso chiiki) under the 過疎地域自立促進特別措置法 (Kaso chiiki jiritsu sokushin tokubetsu sochi hô, (2000-2021). NOTE: Under the new law in place since April 1st, 2021, the eligibility criteria were slightly adjusted again. For example, the fiscal strength cut-off was slightly increased to < 0.51, and the long-term depopulation condition was adjusted from 32% over 45 years (1970-2015) to 28% over 40 years (1975-2015). For details, see MIC. 2021. "Kaso chiiki no jizokuteki hatten no shien ni kan suru tokubetsu sochi hô [Law Regarding Special Measures Concerning Support for the Sustainable Development of De-populating Regions]." *Ministry of Internal Affairs and Communications*. Accessed on 9/1/2024. `https://www.soumu.go.jp/main_content/000807173.pdf`.

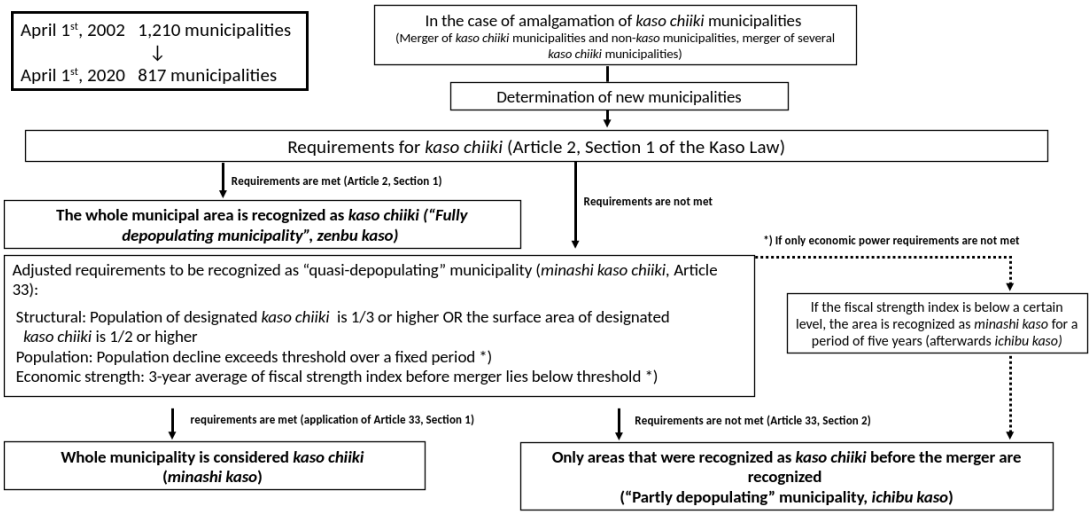

Figure B4. Types of "depopulating regions" (kaso chiiki) NOTE: Under the new law in place since April 1st, 2021, the criteria for different types of "depopulating regions" were slightly adjusted. To qualify as "partly depopulating" municipality, merged municipalities must have a) At least one former town or village within the municipality that fulfills the criteria to be designated as "depopulating region" (see above); b) A fiscal strength index of < 0.64 for the whole municipality. To qualify as a "quasi-depopulating" municipality, "depopulating" areas within the municipality must make for more than 1/2 of the area or the share of residents in "depopulating" areas must make for more than 1/3 of the population of the whole municipality.
Additionally, municipalities must have a fiscal strength index of < 0.51.