Municipal Mergers and Voter Turnout in National Elections in Japan
– 15 Years After Mergers

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Abstract

This paper examines the relationship between municipal mergers and voter turnout in national elections. Building on prior studies regarding the negative impact of municipal mergers on voter turnout, I extend the time period covered to examine whether the negative impact of mergers on turnout persists in subsequent elections. Using data for upper house elections from 1992 to 2019, I demonstrate that: (1) voter turnout was similar between merged and intact municipalities until the 2001 election; (2) turnout began to diverge in the 2004 election; and (3) in the subsequent elections, voter turnout has been lower in merged than in intact municipalities. The findings imply that in the merged municipalities, no actor has replaced the prior role played by municipal politicians in mobilizing voter turnout.

Key words: municipal mergers; urban-rural divide; voter turnout; election; Japan

1. Introduction

This paper examines the relationship between municipal mergers and voter turnout in national elections in Japan. According to studies of Japanese politics, municipal politicians (e.g., mayors and assembly members) play important roles in mobilizing voter turnout for prefectural and national elections (Asano 1998; Curtis 1971; Fukumoto and Horiuchi 2016; Horiuchi 2005, 2009; Imai 2009; Scheiner 2006). Comparing the 2001 and 2007 upper house elections, Horiuchi, Saito, and Yamada (2015) showed that the wave of municipal mergers that took place from 2003 to 2006 had a negative impact on voter turnout.[1] Removal of these key actors presumably brought about a substantial decline in voter turnout in the election immediately after the mergers.

In this paper, I examine whether the negative relationship between municipal mergers and voter turnout has persisted in the subsequent national elections. On the one hand, it seems plausible to expect that no other actor has replaced the roles municipal politicians used to play in the merged municipalities. Rural areas, where a large number of municipal mergers took place, have been facing depopulation and economic stagnation. The reapportionment in 1994 also reduced the share of lower house seats allocated to less populous areas. Given their declining political and economic importance, political parties may find the task of building, or rebuilding, strong support bases in rural areas less urgent or no longer see their importance.

On the other hand, although the level of voter mobilization declined temporarily, parties and candidates might have successfully developed support bases in merged

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[1] The overall voter turnout increased from 2001 to 2007, but the magnitude of the increase was smaller for merged than intact municipalities.

municipalities. For example, they could have found actors such as the local business community to replace the roles that municipal politicians had played in the past. Thus, it is worth investigating whether the difference in voter turnout between merged and intact municipalities observed immediately after the wave of mergers has persisted.

The question addressed in this paper is important in the body of scholarly work that discusses the consequences of boundary consolidations. Mergers of subnational units have been observed in some developed countries in the recent past such as Denmark (2005–2007), Finland (2006–2009), and Japan (2003–2006) as well as numerous subnational units in Australia, Canada, Germany, and Switzerland (Bhatti and Hansen 2011; Blesse and Baskaran 2016; Dollery and Crase 2004; Harjunen, Saarimaa, and Tukiainen 2019; Tindal and Tindal 2000; Yamada 2013).[2] Mergers are still a frequently observed territorial reform today. For example, between 2008 and 2017, 15 European countries implemented reforms that led to a reduction in the number of municipalities (Swianiewicz 2018, 2–3).[3] Even in countries where the actual change has not yet taken

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[2] Sweden experienced a wave of mergers earlier – from 1952 to 1973. The number of municipalities decreased from 2,498 in 1952 to 282 in 1973 (Nelson 1992, 42–43).

[3] The proliferation of local government has taken place in other countries, such as Indonesia; an emerging literature examines the causes and consequences of splitting of local government (Fitrani, Hofman, and Kaiser 2005; Grossman, Pierskalla, and Boswell 2017; Lewis 2017; Pierskalla 2016). Swianiewicz (2010) notes that in Eastern European countries, the wave of divisions took place after the political transition in 1990, in part as "a reaction to an earlier consolidation imposed by the respective communist governments in an undemocratic manner (183)."

place, the possibility of introducing local government consolidations has been discussed (Swianiewicz 2010, 191).

A variety of scholars have examined the consequences of mergers. Closely related to this paper are studies that examine the outcomes for democracy and political participation, including voter turnout in national (Horiuchi, Saito, and Yamada 2015) and local elections (Koch and Rochat 2017), internal political efficacy (Lassen and Serritzlew 2011), political trust (Hansen 2013), and satisfaction with local government (Hansen 2015).[4] These studies generally find that an increase in the size brought about by mergers leads to a decline in the level of outcome variables such as voter turnout, efficacy, and trust. Many authors compare outcome variables between two periods – one before the wave of mergers and the other shortly after. However, it is unclear whether the negative impact persists over the course of subsequent years. Koch and Rochat (2017) indeed find that the magnitude of the negative impact of a merger on voter turnout in Swiss local elections is less for the second and third elections than in the first election following a merger. My paper contributes to this body of literature by examining voter turnout in several national elections before and after the wave of mergers.

The rest of the paper is organized as follows. Section 2 outlines the argument and

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[4] Important works related to the Japanese context include Suzuki and Ha (2018), who illustrate the association of municipal mergers with a decrease in the number of municipal bylaw proposals submitted by assembly members, and Matsubayashi and Ueda (2012), who find that the increase in the municipal population size following a merger led to the increase in the share of female assembly members. See Tavares (2018) for a review of empirical studies on the impact of municipal mergers.

hypotheses. In particular, I argue that no actor has replaced the roles formerly played by municipal politicians because political parties do not find it urgent or important to mobilize voters in rural areas, where many municipal mergers took place; therefore, the negative impact of mergers on turnout is expected to persist. Section 3 summarizes the data. I focus on the upper house elections from 1992 to 2019 and use a dataset in which the unit of observation is post-merger municipalities (boundaries as of 2019). Section 4 presents the findings, which show that: (1) voter turnout was similar between merged and intact municipalities prior to the 2001 election; (2) turnout began to diverge in the 2004 election; and (3) in subsequent elections, voter turnout has been lower in the merged municipalities. Section 5 discusses the results and provides a conclusion.

2. Argument and Hypotheses

2.1 Municipal Mergers and Decline in Voter Turnout

In Japan, municipal politicians play important roles in mobilizing voters not just in local elections but in national ones as well. During a period when the single non-transferrable vote (SNTV) rule was used in the lower house, Diet members from majority-seeking parties, in particular the Liberal Democratic Party (LDP), had to compete against each other within the same electoral district. One of the ways in which LDP politicians sought to deal with intra-party competition was geographic differentiation (Curtis 1971; Horiuchi 2005; Rosenbluth and Thies 2010; Scheiner 2006): each politician had specific municipalities within a district – or communities within a municipality – where their votes were concentrated (Hirano 2006). Municipal politicians in such areas mobilized their supporters to vote for particular Diet members in national elections. This tendency was particularly strong in rural areas, where there were numerous municipal politicians, the capacity of municipal politicians to mobilize voters was high, and the degree of

dependence on the central government was greater.

Municipal mergers profoundly affect the link between municipal politicians and national-level politics since they result in a substantial decrease in the number of municipal politicians. First, the number of mayors immediately declines. Second, municipal mergers lead to a reduction in the number of municipal assembly members since municipalities with larger populations have more residents per assembly member. Suppose Municipalities A and B merge to form a new Municipality C. The sum of municipal assembly members in Municipalities A and B (before the merger) is almost always larger than the number of assembly members in the post-merger municipality (Municipality C). The upper limit of the assembly size was stipulated in Japan's Local Autonomy Law until its 2011 amendment, which is included in Appendix A. The maximum assembly size was determined such that the number of residents per assembly member was greater in municipalities with larger population size.[5]

To illustrate this point, Table 1 depicts the number of municipal assembly members in municipalities that merged into Minamiuonuma City and Uonuma City, and the number of assembly members in these two cities following each merger.[6] The number of assembly members in the post-merger municipality is substantially smaller than in the

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[5] The amendment in 2011 removed the upper limit. However, even after the removal of the upper limit, the population size per assembly member is still substantially smaller in smaller municipalities (Ono and Yamada 2018).

[6] Towns of Muika and Yamato merged in November 2014 to form Minamiuonuma City. In October 2005, Town of Shiozawa merged with Minamiuonuma City. Uonuma City was formed in November 2004 by a merger of six towns and villages.

pre-merger municipalities combined, but the magnitude of the decline is greater for Uonuma City, which resulted from the merger of a greater number of smaller municipalities. For both cities, we observe a substantial decline in the number of assembly members after the mergers.

Table 1: Number of Municipal Assembly Members Before and After Mergers in Uonuma City and Minamiounuma City

(1) Uonuma City

Pre-merger municipalities	Population (2000 Census)	Pre-merger assembly size	Post-merger assembly size (Uonuma City)		
			2009	2013	2017
Horinouchi	9,653	18			
Koide	12,945	20			
Yunotani	6,655	16	24	20	20
Hirokami	9,116	18			
Sumon	4,969	14			
Irihirose	2,048	12			
Total	45,386	98	24	20	20

(2) Minamiuonuma City

Pre-merger municipalities	Population (2000 Census)	Pre-merger assembly size	Post-merger assembly size (Minamiuonuma City)		
			2009	2013	2017
Muika	29,295	24			
Yamato	15,636	20	26	26	22
Shiozawa	20,561	16			
Total	65,492	60	26	26	22

Source: Japan Municipal Research Center (n.d.)

The substantial reduction in the number of municipal politicians was observed across Japan. Table 2 shows the numbers of municipalities and municipal assembly members from 1998 to 2019, which both decreased during this time period. The number of municipalities declined from 3,255 in 1998 to 1,741 in 2014. There were more than 60,000 municipal assembly members in 1998, which declined by more than half by 2019. Given the presumably important roles municipal politicians played in voter mobilization, it is likely that municipal mergers would result in a decrease in voter turnout – at least in the short-run (Horiuchi, Saito, and Yamada 2015).

Table 2: Number of Municipalities and Municipal Assembly Members, 1998–2019

Year	Number of Municipalities	Number of Municipal Assembly Members
1998	3,255	60,303
1999	3,252	59,598
2000	3,252	59,053
2001	3,246	58,492
2002	3,240	57,961
2003	3,199	56,612
2004	2,950	54,139
2005	2,166	45,862
2006	1,840	40,631
2007	1,821	36,014
2008	1,805	35,165
2009	1,795	34,201
2010	1,750	33,156
2011	1,742	32,070
2012	1,742	31,705
2013	1,742	31,250
2014	1,741	30,825

2015	1,741	30,490
2016	1,741	30,334
2017	1,741	30,101
2018	1,741	29,839
2019	1,741	29,762

Note: Data is as of December 31 of each given year. The number of municipalities is obtained from the Ministry of Internal Affairs and Communications Statistics Bureau (n.d.). The number of assembly members is drawn from the Ministry of Internal Affairs and Communications (n.d.). Tokyo's 23 special wards are counted as municipalities.

2.2 Long-Term Consequences for Voter Turnout in Rural Areas

What are the long-term consequences of mergers on voter turnout? I argue that the negative impact on voter turnout continues to be observed in elections subsequent to the one held shortly after the wave of mergers.

First, the reapportionment in the lower house in 1994 reduced the share of lower house seats allocated to rural areas, which led to the reduction of transfers from the central government to local governments located in areas that used to be overrepresented (Horiuchi and Saito 2003). With the prolonged economic stagnation, decrease in resources available for redistribution, and declining importance of rural constituencies, it appears controversial for majority-seeking parties to provide generous benefits that favor rural areas without alienating urban voters.[7] In other words, political parties would not find it urgent or important to build (or rebuild) strong support bases there.

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[7] Municipal mergers can be interpreted as an attempt by the LDP to reallocate resources from rural to urban areas, where now there are a greater fraction of Diet seats (Horiuchi, Saito, and Yamada 2009; Rosenbluth, Saito, and Yamada 2011).

Second, even if parties are interested in winning votes in rural areas by intense mobilization, it seems enormously difficult and costly to cobble together enough actors across Japan who are as capable of and interested in mobilizing voters in national elections as municipal politicians had been. There is an additional cost to maintaining a large number of loyal activists in the long run – to do so would require the party to continue to provide benefits to such actors, which would direct resources in favor of rural areas.

Furthermore, providing narrow benefits to a small number of core supporters may alienate the vast majority of voters (Catalinac 2015, 2016; Rosenbluth and Thies 2010). Winning a majority vote share is necessary to receive a seat under the majoritarian electoral rule; if most voters – even in rural constituencies – see the provision of generous benefits to a small number of core activists as wasteful, then it seems difficult for parties to heavily rely on mobilizing voters in rural areas across Japan. As Catalinac (2015) points out, "candidates have incentives to avoid appearing to play favorites and appeal to the less-intense preferences of unorganized voters with a policy platform comprised of policy issues that most voters care about to some degree (51)."[8]

In addition to the decline in the number of municipal politicians, studies of the size of political units suggest that voters in smaller political units are more likely to feel the government is accessible and responsive. As a result, they would feel a higher degree of political efficacy, which likely reinforces their participation in politics. A merger increases

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[8] Similarly, Sasada (2008) argues that the need to appeal to a broader constituency under the new electoral rule likely discourages politicians from promoting agricultural protection.

the size of the political unit, which may lead to a decline in political efficacy as well (Lassen and Serritzlew 2011). Lower political efficacy may discourage voters from participating in politics, leading to lower voter turnout.

The above discussions imply that no actor has replaced the roles that municipal politicians played. Coupled with the tendency of voters in larger municipalities to have lower political efficacy, I expect that the negative impact of municipal mergers on voter turnout will persist. The following hypothesis will be tested: *For all national elections held after the wave of mergers (2007 and onward), the magnitude of the decrease (increase) in voter turnout from the pre-merger turnout level is greater (smaller) in municipalities that had experienced mergers in the 2000s than those that did not experience mergers.*

3. Data

3.1 Voter Turnout in Upper House Elections

I examine data on voter turnout in the upper house elections in Japan from 1992 to 2019 so that the analyses cover several elections before and after the wave of municipal mergers. I consult upper house election data in order to build upon Horiuchi, Saito, and Yamada (2015) and examine whether their main finding – municipal mergers negatively impact voter turnout – holds when the time period covered is expanded. Further, the district boundaries to elect representatives from prefectural districts remained unchanged during this period, with the exception of two cases of district mergers (Tottori and Shimane; Tokushima and Kochi) following the 2016 election. The electoral formula to elect representatives from prefectural districts (single non-transferable voting, or SNTV, if the district magnitude is greater than one, and simple plurality rule if the district magnitude is one) also remained unchanged. District magnitudes changed in some

prefectures due to reapportionment; the closed-list PR has also been replaced by the open-list PR from the 2001 election. However, stable district boundaries mitigate the concern that district boundary changes are associated with both municipal mergers and decline in voter turnout.[9]

3.2 Data

As noted above, I employ voter turnout data from the 1992 to the 2019 elections. Data from 1992 to 2013 was obtained from the database of upper house elections compiled by Natori et al. (2014). Data for 2016 and 2019 are drawn from Yomiuri Shimbun's dataset.

The unit of observation is municipalities as of 2019 boundaries. The dependent variable is voter turnout. The independent variable is whether the municipality experienced a merger in the recent past. For each municipality in the dataset, I create a binary variable indicating whether it experienced a merger between 1999 and 2014. In

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[9] For example, suppose a municipality that used to be considered an LDP stronghold is suddenly included in a swing district. Suppose also that such municipalities are mostly located in rural areas, where a large number of mergers took place. Voter turnout may increase in those municipalities due to the increase in competitiveness; if municipal mergers were more likely to take place in such areas, we may underestimate their impact. At the same time, I acknowledge that the decrease in the district magnitude from 2 to 1 in some prefectural districts for the upper house could have led to an increase in the degree of electoral competition. If many municipal mergers took place in those prefectures (which tend to be rural), my analysis likely underestimates their impact; in other words, the reapportionment and the change in the district magnitude for some prefectures would make it more challenging to identify the negative impact of a merger.

1999, the relevant laws were amended to provide stronger incentives for mergers; 2014 marked the last reported merger, as of the writing of this paper (June 2020). Most cases are concentrated between 2003 and 2006. Pre-merger data of the municipalities that experienced mergers are aggregated at the level of post-merger municipalities.[10]

4. Findings

4.1 Voter Turnout in Merged and Intact Municipalities

This section reports the findings. Figure 1 compares the mean turnout in the merged and intact municipalities. In Appendix B, I include summary statistics for each year. Several observations can be made. First, the average voter turnout is similar between the merged and intact municipalities until the 2001 election. Second, turnout begins to diverge in the 2004 election. Third, turnout in the 2007 election, which is the first national election after the completion of most mergers, is lower in merged than in intact municipalities. Fourth, in subsequent elections (2010, 2013, 2016, 2019), the average turnout in merged municipalities is lower than in intact municipalities. Finally, comparing the change in voter turnout over time, the magnitude of the decrease (increase) is greater (smaller) for the merged than intact municipalities. For example, from 2001 to 2019, voter turnout on average decreased by 7.41 percentage points (62.65 to 55.24) in the intact municipalities and by 10.63 percentage points (62.66 to 52.03) in the merged

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[10] Suppose Municipalities A and B merged to form a new Municipality C. All the turnout data for Municipalities A and B are aggregated at the level of the post-merger municipality (Municipality C). In an election held before the merger, suppose 600 out of 1,200 eligible voters in A and 600 out of 800 eligible voters voted in B. Then, voter turnout for the area that would form Municipality C is 60% (1,200/2,000).

municipalities.

Figure 1: Mean Voter Turnout in the Upper House Elections in Merged and Intact Municipalities, 1992–2019
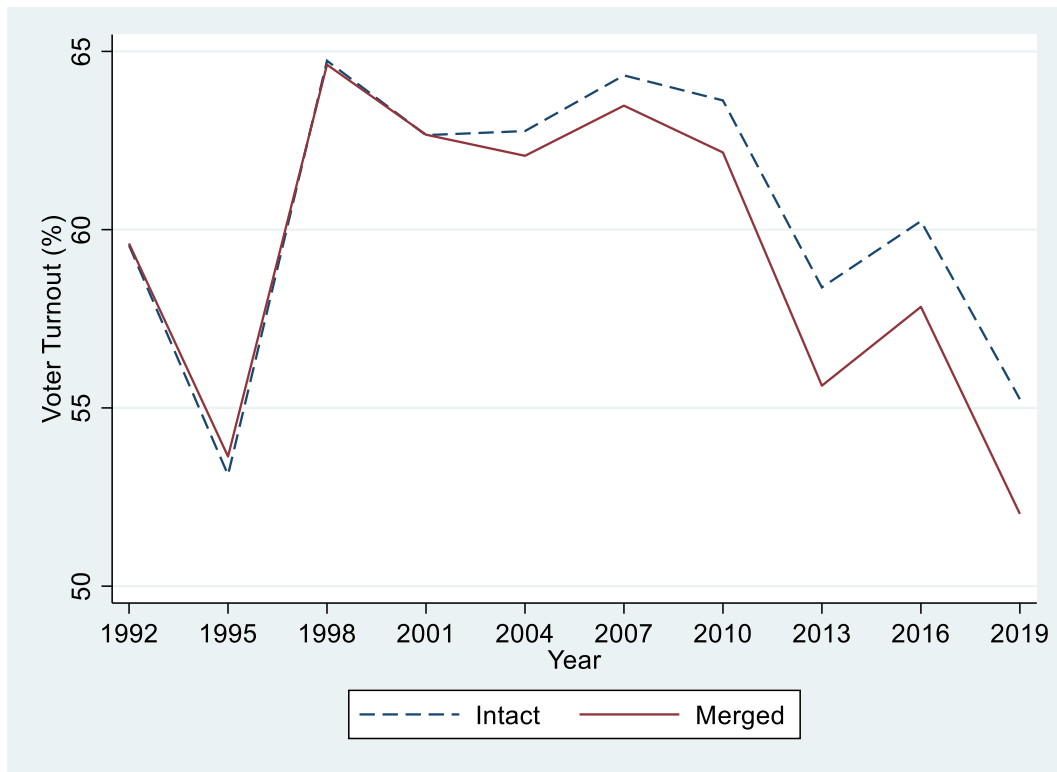
Note: Arithmetic means for each group are reported.

Thus, the negative impact of municipal mergers continues to be observed in the elections beyond the first election following the merger. Furthermore, the magnitude of the difference between intact and merged municipalities is indeed greater for more recent elections. In the 2007 election, turnout in the intact municipalities was higher than in merged municipalities by 0.85. The differences are 2.72, 2.48, and 3.25 percentage points in the 2013, 2016, and 2019 elections.

The substantive conclusion – negative impact of municipal mergers on voter turnout – remains unchanged with the use of voter turnout weighted by the number of eligible

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voters (Appendix C). When using the weighted mean, voter turnout in the merged municipalities was higher than in the intact municipalities during the pre-merger period (until 2001). The gap has narrowed since the 2004 election, and from the 2013 election onward, the average turnout (weighted by the number of voters) is lower in the merged than in the intact municipalities.

4.2 Note on Analysis Within Municipality

One of the limitations of the current study is the use of data at the level of post-merger boundaries. My argument suggests that the impact of a merger likely varies across areas within the merged municipality.

Elsewhere I have argued that the negative impact of a merger should be more pronounced in municipalities with population sizes that are small relative to the merger partners (Yamada 2016, 2018). Indeed, voters in such localities are more likely to report a decline in the perceived level of public services (Yamada 2018) and less frequent interactions with local politicians (Yamada and Arai 2020); the volume of nighttime light – used to measure public spending – also declines more substantially in localities with a smaller pre-merger population size (Pickering, Tanaka, and Yamada 2020). Similarly, Suzuki and Sakuwa (2017) find that the peripheral areas of merged municipalities in Japan experienced population declines of greater magnitudes after the wave of mergers. Studies of municipal mergers in other countries demonstrate similar findings. For example, Harjunen, Saarimaa, and Tukiainen (2019) discuss how Finnish municipalities with small population sizes experienced a decline in political representation and public jobs after mergers with larger neighbors. Likewise, Voda and Svačinová (2019) show that in the Czech Republic, peripheral areas of merged municipalities have a lower probability of having representatives in the municipal councils who live nearby.

Since the magnitude of the decline in municipal assembly members is greater for municipalities that merge with larger neighbors, the degree of mobilization presumably declines more substantially there. Studies of the size of political units also suggest that voters' political efficacy declines after mergers due to the increase in the population size of the municipality, which may lead to a decrease in voter turnout. Thus, we should observe a decline in voter turnout of greater magnitude in localities corresponding to pre-merger municipalities with smaller population sizes when compared to those corresponding to larger pre-merger municipalities. Given the absence of readily available turnout data at the level of pre-merger municipalities, I seek to test this observable implication in future work. As a preliminary analysis for future work, I focus on the case of Nagaoka City in Niigata Prefecture and examine the variation in voter turnout within the municipality. The results, reported in Appendix D, are more or less consistent with my expectation.

5. Conclusion

I conclude by discussing several implications of the findings. First, merged municipalities have lower voter turnout in all five elections after the wave of mergers. This is consistent with studies of voting behavior in the United States, which find that contacting voters, partisan or non-partisan, positively impacts voting and that the long-term decline in voter turnout has been driven in part by a decrease in voter mobilization (Gerber and Green 2000; Green, Gerber, and Nickerson 2003; Michelson 2003; Nickerson, Friedrichs, and King 2006; Putnam 2000).

Second, turning to politics in Japan, what might happen to political competition with respect to the urban–rural dimension in the near future? One expectation would be a decline in organized votes in rural areas and an increase in the volatility of election

outcomes there. In the past, some voters consistently selected candidates in national elections based upon the preference of the municipal politicians whom they (voters) supported. Now that there are fewer municipal politicians and no actor has apparently replaced their roles, some voters might no longer vote based on their ties with municipal politicians but on other considerations such as their perception of government performance or opinion of the prime minister. A wider swing in parties' vote shares is likely observed not just in urban but in rural areas as well, resulting in a substantial fluctuation in parties' seat shares over time.

Another possibility would be further declines in the political influence of rural areas. The reapportionment in 1994 curtailed the share of rural seats and increased that of urban seats, which likely brought about the decrease in the political power of rural areas. Subsequently, the large wave of municipal mergers took place. If municipal politicians were influential in central government policies – they supported Diet members who lobbied the central government on their behalf, and the central government accommodated their request to some degree – their removal would result in the further loss of political power of rural areas in Japan's politics. The decline in political power could accelerate the decrease in the transfers to and public works in rural areas as well as widening inter-regional inequality, as was observed in the 2000s and 2010s (Song 2015; Suzuki 2019).[11]

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[11] At the same time, certain features of subnational institutions remain unchanged, such as the SNTV rule to elect assembly members. It would be interesting to examine whether and to what extent the *type* of interests that municipal politicians (who as a group survived municipal mergers) represent today is different from that before the wave of mergers

Third, would it be possible to expect a reversal of the current trend – declining influence and benefits allocated in favor of rural areas? For example, would the government perceive the further depopulation and economic stagnation of rural areas and overcrowding of Tokyo to be undesirable, and implement policies to provide more benefits to rural areas? I speculate that this will not be the case. For rural areas, regaining influence over the central government through political competition seems unlikely because of the decline in their political power; it is even possible to expect further institutional changes against rural areas such as reapportionment in the Diet, another wave of municipal mergers, and even prefectural mergers. Of course, if the rest of the country – urban voters in particular – perceives that the cost associated with further economic and demographic declines in the countryside has become too high, they might support the more generous allocation of resources in favor of rural areas.[12] However, Japanese voters in general do not seem recently to strongly support larger government and more protection, including more generous inter-regional redistribution and a higher level of public investment in rural areas. Such policies would be perceived as wasteful by the majority of voters; given majoritarian electoral rule, it would be difficult for candidates and parties to campaign on aggressive spending and redistribution without electoral sanction unless something extraordinary occurs to alter people's preferences.

(Hijino 2016; Sunahara 2011).

[12] For example, for some voters there might be a psychological cost to observing rural decline. Others might perceive that rural decline accompanies more substantive concerns – such as the substantial deterioration of land, higher chance of natural disasters, slower inflow of young people into urban areas, and greater foreign influence.

Finally, related to the last point, would the 2020 pandemic alter the situation? Many people and businesses – regardless of geographic locations and sectors – have already experienced or are likely to experience economic hardship due to the limitations of economic activities imposed by the pandemic. Relying on tourists from abroad as a low-cost way of carrying out inter-regional redistribution or boosting the economic conditions of rural areas (in the sense that it does not require government spending) would not work as well for a while. It is possible that people's preferences might shift in favor of more spending, greater redistribution, and more generous protection. Consequently, political parties might put together platforms that seek protection and redistribution – including inter-regional redistribution and public spending in less populous areas – to win elections. On the other hand, whether and how much voters' preferences change remains uncertain and seems to depend in part on how severe and long-lasting the public health and economic damages would be as well as the resilience of the views among voters and politicians that efficiency is a good thing and larger government – both in terms of the level of spending and the number of civil servants – is undesirable. In addition, the majoritarian electoral rule is associated with lower spending and less protection (e.g., Alesina and Glaeser 2004; Bawn and Rosenbluth 2006; Estévez-Abe 2008; Iversen and Soskice 2006). Therefore, institutions may moderate the impact of the change in people's preferences brought about by the pandemic and consequent economic hardship.[13] It

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[13] Globalization could be one of the factors that encouraged politicians and globally competitive actors to support the introduction of the majoritarian institution in the 1980s and 1990s (Rosenbluth 1996; Rosenbluth and Thies 2010). In an unlikely scenario where countries around the world continue to experience health and economic difficulties for

would be interesting to further consider the long-term implications of municipal mergers for politics at the national level, particularly with respect to the urban–rural dimension.

years to come, cross-border flows of people and goods may decrease and remain lower than pre-pandemic levels. Then, domestic actors' preferences may shift in favor of redistribution or the relative political powers of various actors in society could change. In that case, we might observe pressure for institutional changes.

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Appendix A: Upper Limit of Assembly Size Before the 2011 Amendment to the Local Autonomy Law

| Cities		Towns and Villages	
Population Size	**Upper Limit**	**Population Size**	**Upper Limit**
900 ~	64 ~ 96	20 ~	26
500 ~ 900	56	10 ~ 20	22
300 ~ 500	46	5 ~ 10	18
200 ~ 300	38	2 ~ 5	14
100 ~ 200	34	~ 2	12
50 ~ 100	30		
~ 50	26		

Note: Population size is measured as thousands of residents. For cities with a population size greater than 900,000, the upper limit increases by eight seats for every additional 400,000 residents. However, the upper limit cannot exceed 96.

Appendix B: Municipal Mergers and Voter Turnout in the Upper House Elections, 1992–2019

	Intact			Merged			Difference in turnout (Intact minus Merged)	t-statistic	p-value
	N	Mean	SD	N	Mean	SD			
1992	1,152	59.56	12.65	589	59.61	11.36	-0.05	-0.08	0.93
1995	1,152	53.12	12.64	589	53.64	10.82	-0.52	-0.84	0.40
1998	1,152	64.74	9.10	589	64.63	7.96	0.11	0.25	0.80
2001	1,152	62.65	9.28	589	62.66	7.88	-0.01	-0.03	0.98
2004	1,152	62.77	9.29	589	62.07	7.50	0.69	1.57	0.12
2007	1,152	64.33	8.18	589	63.48	6.90	0.85	2.16	0.03
2010	1,152	63.63	8.11	589	62.16	6.68	1.46	3.76	< 0.01
2013	1,152	58.38	8.64	589	55.62	6.96	2.76	6.71	< 0.01
2016	1,152	60.24	8.25	589	57.84	6.35	2.40	6.19	< 0.01
2019	1,152	55.24	9.47	589	52.03	7.07	3.22	7.27	< 0.01

Note: Difference in turnout illustrates the difference in the mean turnout between intact and merged municipalities. Arithmetic means are reported, and t-statistics and p-values are for the comparison between the merged and intact municipalities for each election.

Appendix C: Municipal Mergers and Voter Turnout Weighted by the Number of Eligible Voters
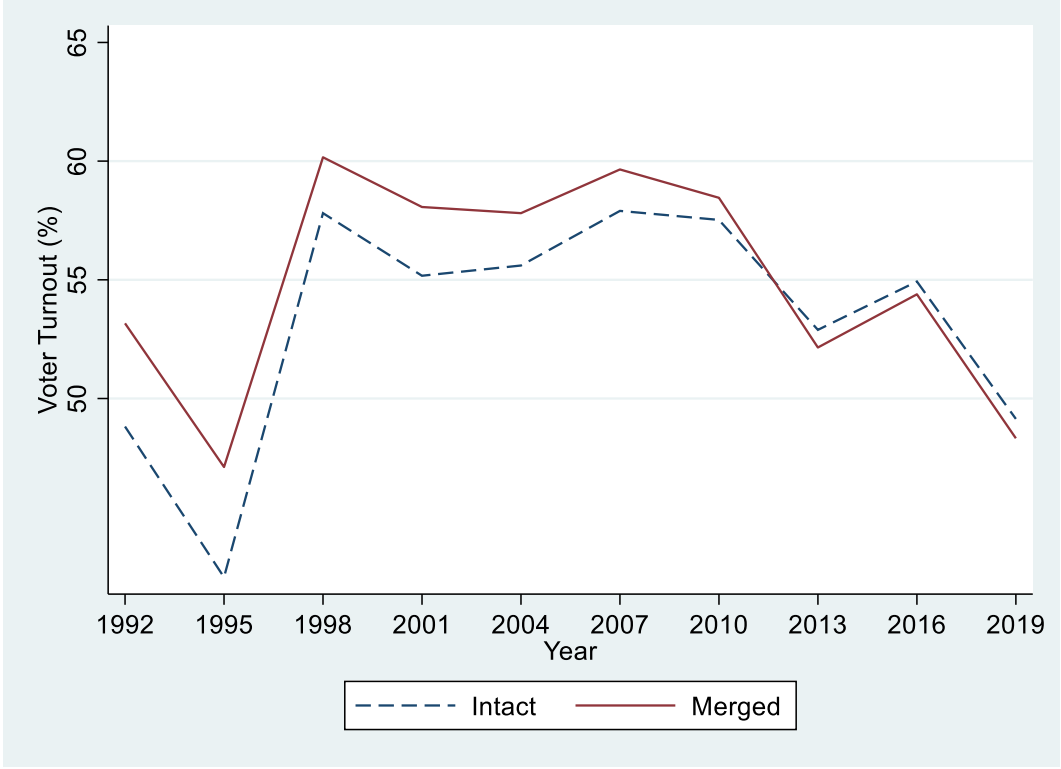
Note: For the merged and intact groups, the mean weighted by the number of eligible voters is reported.

Appendix D: Voter Turnout in Upper House Elections in Nagaoka City

Nagaoka City merged with ten smaller neighboring municipalities in three waves: 2005, 2006, and 2010.[14] Figures D1 is the map of municipalities in Niigata Prefecture in 2000; municipalities that would form post-merger Nagaoka are highlighted. In Table D1, I report (1) voter turnout and (2) the number of voters from 1992 to 2004 (pre-merger period) and 2016 and 2019 (post-merger period) at the level of areas corresponding to the pre-merger municipalities that would form the post-merger Nagaoka City. I also report (3) the difference between voter turnout of the area corresponding with pre-merger Nagaoka (center) and each of the other pre-merger municipalities (peripheral areas). For the post-merger periods, 2016 and 2019 data are used because of the availability of turnout data at the level of pre-merger municipalities.

My argument implies that voter turnout in the peripheral areas (areas external to pre-merger Nagaoka) would decline more substantially than the populous, central area (pre-merger Nagaoka). Given the decrease in the number of municipal politicians in peripheral areas, the degree of voter mobilization should have declined more substantially, resulting in a decline in turnout. I list the number of voters to show the size of each area; areas with smaller numbers of voters should be more profoundly affected by the merger.

From Panels (1) and (3), we can see the difference in turnout between Nagaoka and the rest is mostly smaller during the post-merger period (2016 and 2019) than in the pre-merger period (from 1992 to 2004). For example, the difference between Nagaoka and

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[14] In April 2005, Nagaoka merged with Nakanoshima, Koshiji, Yamakoshi, Oguni, and Mishima. In January 2006, Tochio, Teradomari, Yoita, and Washima joined, followed by Kawaguchi in 2010.

Koshiji is more than ten percentage points before the merger but less than seven percentage points after the merger. Similarly, for Kawaguchi, the difference is more than 19 percentage points until the 2001 election; after the merger, it is around ten percentage points. These findings are consistent with my argument.

Another point we can observe from Table D1 is the population decline in peripheral areas after the merger. All the municipalities except Nagaoka (center) experienced a population decline, which is consistent with the finding of Suzuki and Sakuwa (2017). Comparing the 2001 and 2019 data, the number of voters in Yamakoshi, Tochio, Oguni, and Kawaguchi declines by 53.4% (from 2018 to 888), 23.2%, 22.3%, and 19.3%, respectively. Thus, although the difference in turnout with the center remains high for some peripheral areas, the number of voters there declined substantially. To spatially visualize these patterns, Figure D2 reports maps showing the number of voters before the mergers (2001) as well as changes in voter turnout and the number of voters from 2001 (pre-merger period) to 2019 (post-merger period).

Nagaoka is to some extent unique because of the Chuetsu Earthquake that hit the region in October 2004. Some of the municipalities that would merge with Nagaoka experienced substantial damages; the epicenter was in Kawaguchi, and all the residents of Yamakoshi had to temporarily evacuate to (per-merger) Nagaoka due to the severe damage. The decreases in turnout and population size in peripheral areas might have been accelerated by the earthquake. Thus, although Nagaoka's data is suggestive, it would be important to see if the pattern of turnout reported above is generalizable beyond Nagaoka by examining data from all the municipalities that experienced mergers, or at least a random sample of the merged municipalities.

**Figure D1: Municipalities in Niigata Prefecture in 2000**
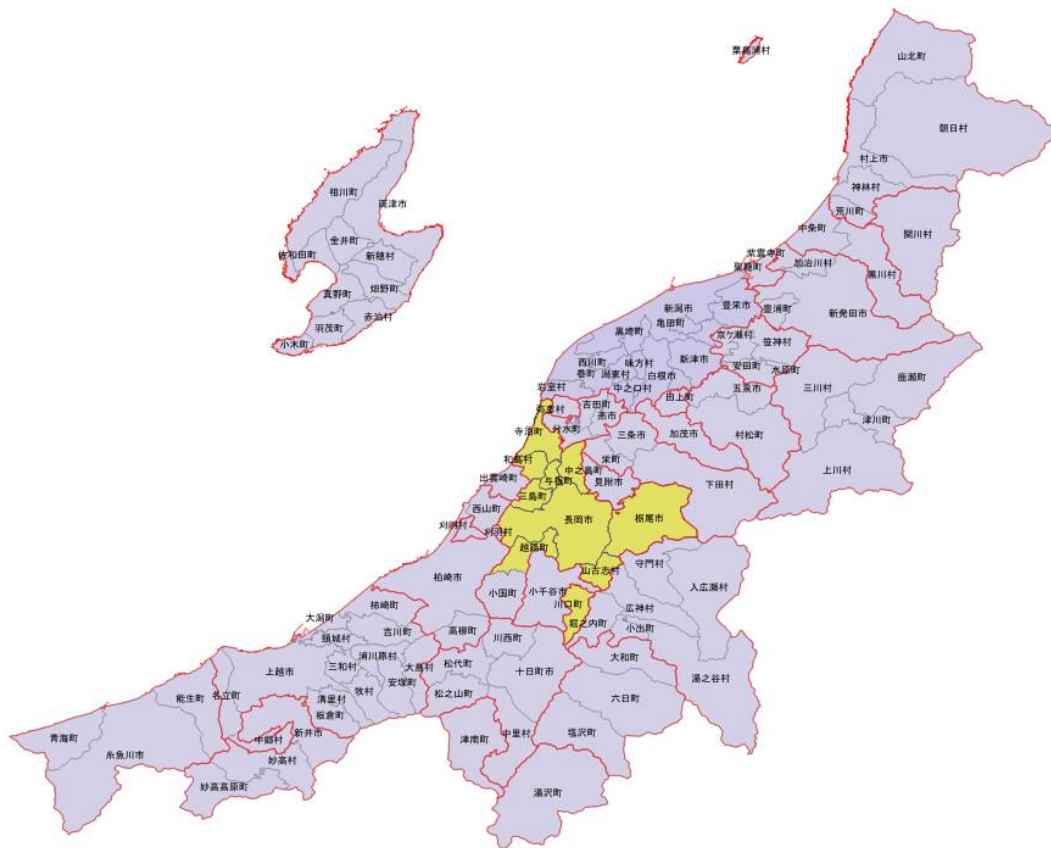
Note: Thin black lines show municipal boundaries as of 2000, which is before the wave of mergers. Labels (in Japanese) indicate the names of pre-merger municipalities. Solid red lines are municipal boundaries as of 2020. Nagaoka and surrounding municipalities that would merge with Nagaoka are highlighted.

The figure was constructed using administrative boundary data available at the National Land Information download website, Ministry of Land, Infrastructure, Transport and Tourism.

URL: https://nlftp.mlit.go.jp/ksj/gml/datalist/KsjTmplt-N03-v2_4.html (Date accessed: September 5, 2020)

Figure D2: Maps of Nagaoka

(1) Number of voters in 2001
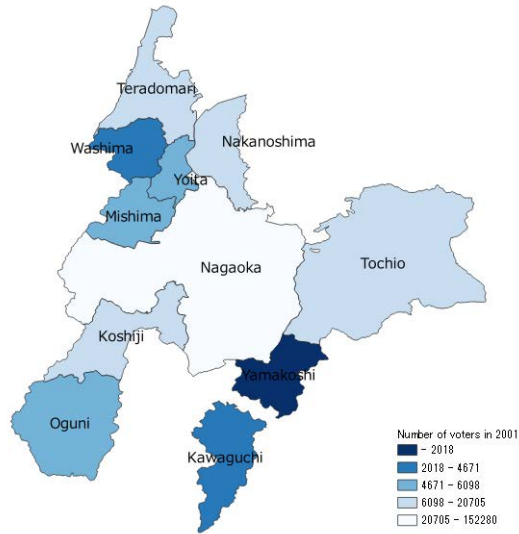
(2) Change in voter turnout from 2001 to 2019 (in percentage points)

(3) Change in the number of voters from 2001 to 2019 (in percent)

Note: Upper house election data – at the level of pre-merger municipalities – was combined with administrative boundary data available at the National Land Information download website, Ministry of Land, Infrastructure, Transport and Tourism.
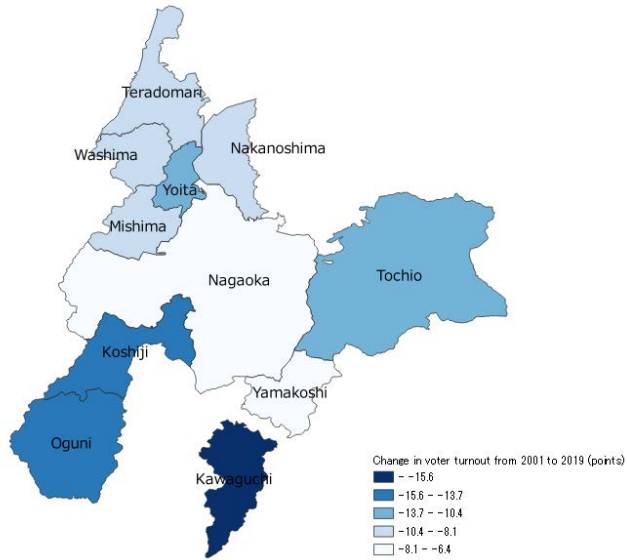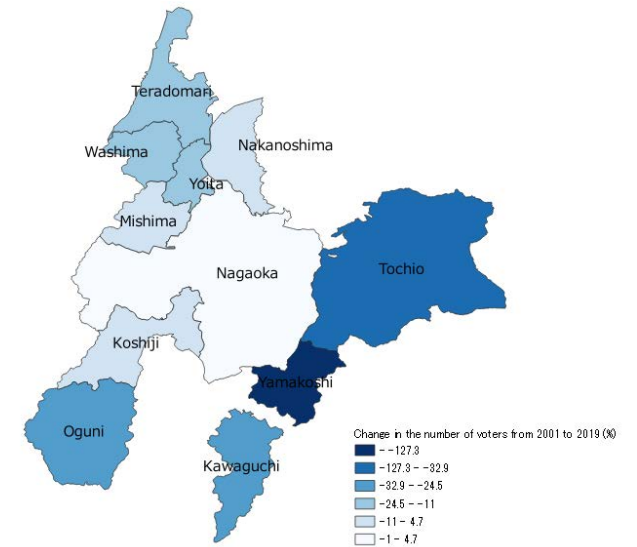
Table D1: Voter Turnout, Number of Voters, and Difference in Turnout between Pre-Merger Nagaoka and the Rest

(1) Voter Turnout

Year	Nagaoka	Tochio	Nakanoshima	Koshiji	Mishima	Yoita	Washima	Teradomari	Yamakoshi	Kawaguchi	Oguni	Overall
2019	52.4	60.4	55.5	58.9	58.1	58.9	61.7	57.6	71.3	62.5	67.3	54.6
2016	58.4	65.6	60.3	65.1	63.7	63.4	67.6	61.5	73.8	69.1	72.2	60.4
2004	61.3	70.7	64.9	71.3	67.7	66.2	72.2	67.4	75.9	76.3	79.2	64.3
2001	58.9	70.7	64.3	73.4	67.8	69.3	70.9	65.7	77.8	78.2	80.9	63.0
1998	66.9	75.6	69.5	77.7	75.0	72.4	76.1	73.0	82.6	86.1	83.4	70.1
1995	47.2	58.9	51.7	69.0	59.5	55.3	54.8	50.8	76.1	71.6	74.1	52.0
1992	48.8	65.7	56.4	72.9	60.1	59.1	62.3	55.5	76.8	81.7	81.7	55.0

(2) Number of Voters

Year	Nagaoka	Tochio	Nakanoshima	Koshiji	Mishima	Yoita	Washima	Teradomari	Yamakoshi	Kawaguchi	Oguni	Total
2019	159,806	15,585	9,796	11,391	5,696	5,443	3,488	8,208	888	3,751	4,612	228,664
2016	159,349	16,822	10,072	11,747	5,820	5,649	3,689	8,746	990	3,981	4,970	231,835
2004	153,957	20,284	10,133	11,629	5,925	5,984	4,139	9,608	1,906	4,659	5,933	234,157
2001	152,280	20,705	10,097	11,508	5,903	6,043	4,158	9,838	2,018	4,671	6,098	233,319
1998	148,743	21,059	9,909	11,335	5,709	6,043	4,158	9,875	2,109	4,747	6,282	229,969
1995	144,125	21,354	9,610	10,987	5,512	5,878	4,193	9,998	2,211	4,754	6,471	225,093
1992	139,108	21,450	9,187	10,900	5,313	5,622	4,179	10,062	2,306	4,729	6,525	219,381

(3) Difference in Voter Turnout from Pre-Merger Nagaoka

Year	Nagaoka	Tochio	Nakanoshima	Koshiji	Mishima	Yoita	Washima	Teradomari	Yamakoshi	Kawaguchi	Oguni
2019	0.0	7.9	3.0	6.5	5.7	6.5	9.2	5.2	18.8	10.1	14.8
2016	0.0	7.2	2.0	6.7	5.4	5.0	9.2	3.2	15.5	10.7	13.8
2004	0.0	9.4	3.7	10.1	6.4	4.9	11.0	6.1	14.7	15.1	17.9
2001	0.0	11.9	5.4	14.5	9.0	10.5	12.1	6.8	18.9	19.3	22.0
1998	0.0	8.7	2.6	10.7	8.1	5.5	9.2	6.0	15.7	19.2	16.5
1995	0.0	11.7	4.5	21.8	12.3	8.1	7.6	3.6	28.9	24.4	26.9
1992	0.0	16.9	7.6	24.2	11.3	10.3	13.5	6.8	28.0	32.9	32.9

Note: Data for the upper house elections is used. The unit of observation is areas corresponding to pre-merger municipalities that would form post-merger Nagaoka City. Panel (3) illustrates the difference in voter turnout between pre-merger Nagaoka City and each of the other municipalities.