

# Effects of Municipal Mergers in Japan

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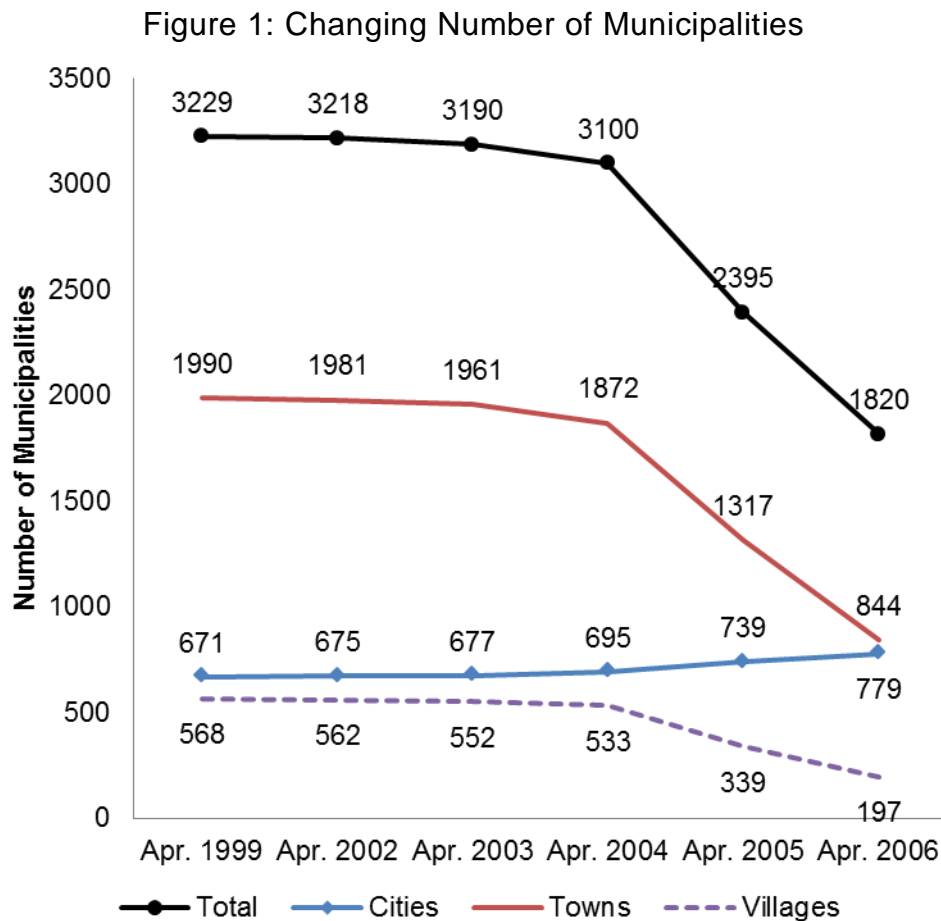
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# 1. Introduction

The purpose of this paper is to examine the effects of municipal mergers in Japan, using propensity score analysis.

The role of the municipality becomes increasingly important amid the advance of decentralization. Therefore, in order to strengthen the administrative and financial bases of municipalities and to maintain and improve the public services of municipalities, many municipalities enlarge the size of government through municipal mergers in Japan. As Figure 1 shows, the number of municipalities decreased from 3229 in April 1999 to 1820 in April 2006. The large wave of municipal mergers known as the big merger of Heisei (Heisei no Daigappei) . Most of the mergers occurred from 2004 to 2006.



Source: Ministry of Internal Affairs and Communications (2006)

However, the inhabitant’s evaluations of municipal mergers divide. According to

Ministry of Internal Affairs and Communications (2010), there are many negative opinions of inhabitant on the evolution of municipal mergers. Conversely, According to Kawamura (2010), half inhabitant positively evaluate municipal mergers.

We can regard municipal mergers as enlarging the size of local government. Many studies, e. g. Dahl and Tufte (1973), Larsen (2002), Alesina and Spolaore (2003), etc., attempt to examine the effects of enlarging the size on democracy, efficiency, and public services. However, The Opinions are divided among previous studies on the effect of enlarging the size as with the inhabitant's opinions. For instance, Natori (2009) shows the negative effect of municipal mergers on voter turnout. Conversely, Mabuchi (2002) shows the positive or neutral effect of municipal mergers on democracy. In addition, Mabuchi (2003) shows municipal mergers increase political participation but decrease Partisan Competition. Yoshimura (2004) shows the positive effect of municipal mergers on public service. However, the Opinions are divided on the argument about minimum optimal scale and efficiency of scale divide.

The main problem is due to the research design in previous studies. In order to estimate the effect of municipal mergers on voter turnout, it is necessary to compare the voter turnout of merged municipality with the voter turnout of the same and not-merged municipality. However, we cannot make the "experiment."

Therefore, previous studies attempt to estimate the effect using following two methods. First method is to estimate the correlation between voter turnout and size of municipalities. However, the method is not to estimate the effect of municipal mergers on voter turnout because it doesn't distinguish between merged municipalities and not-merged municipalities. Second method is to estimate the effect of increase rates of size on voter turnout using regression analysis. However, the method in regression will have omitted variable bias. Therefore, I attempt to estimate the effects of municipal mergers using different method from previous studies.

## 2. Method and Data

### 2.1. Method

In this paper, I use propensity score matching<sup>1</sup> to examine the effects of municipal mergers on democracy, efficiency, and public services. Specifically, first, I calculate the propensity score using logistic regression from covariates. Covariates are variables that affect treatment (municipal mergers) assignment and dependent variable. Next, I create matched municipalities by matching pairs of treated (merged) municipalities and untreated (not-merged) municipalities with a similar propensity score. Treated and untreated municipalities within the same matched pair have a similar propensity score. Finally, I estimate the effects of municipal mergers as the difference of democracy, efficiency, and public services using matched municipalities.

### 2.2. Covariates

In this paper, covariates are variables that affect municipal mergers, democracy, efficiency, and public services. Therefore, I use population, area, financial capability, and the degree of rural as covariates. Kawamura (2010), and Kido and Nakamura (2008) show population, area, and financial capability as variables that explain municipality merger promotion in Japan. Population and financial capability are variables that affect democracy, efficiency, and public services. Moreover, the degree of rural is variables that affect municipality merger promotion, population, area, financial capability, and the degree of rural. Table 1 summarizes the data for covariates.

In addition, as Figure 2 shows, when I use the data of municipality before merger, I deal with the data of new city of D by addition all data of city of A, B, C.

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<sup>1</sup> For detailed descriptions of propensity score analysis, see Guo and Fraser (2009), and Hoshino (2009).

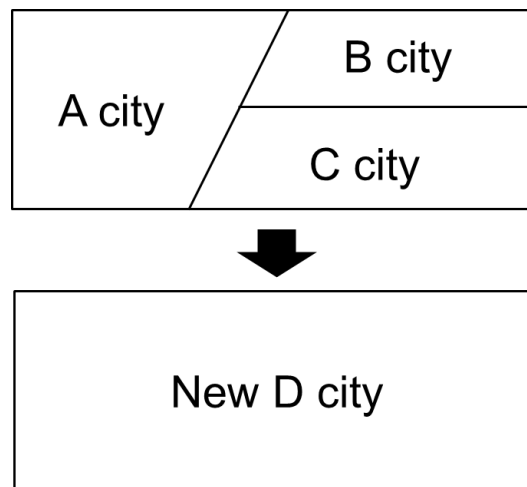
Table 1: Data for Covariate

No	Variables		Fiscal Year	Source
1	Population		2004, 2005	<i>Population Census of Japan</i>
2	Area (ha)			
3	Percentage of Employed Person in Primary Sector of Industry (%)			
4	Financial Capability Indicator	The value is calculated as the past three year average of the figures derived from dividing basic financial revenues by basic financial needs.	2004, 2005	<i>Tokei de miru Shikuchōson no Sugata</i> [Statistical Observations of Cities, Wards, Towns and Village]

Note 1: Financial capability indicator is used to indicate the financial strength of local government. A higher figure for the financial capability indicator means that the local public body can be said to have a greater margin for revenue sources.

Note 2: Data from variable 1 to variable 3 of 2004 is calculated with linear interpolation using data of 2000 and 2005.

Figure 2: Data of Municipality before Merger



## 2.3. Independent Variable and Dependent Variables

In this paper, independent variable is municipal mergers in Japan. Table 2 summarizes the data for independent variable.

Table 2: Data for Independent Variables

No	Variables		Fiscal Year	Source
1	Merger Dummy	1 if municipalities merged, 0 otherwise	2004, 2005	<i>Information for Municipal mergers and dissolutions in Japan</i>

In this paper, dependent variables are democracy, efficiency, and public services. I use the data of proportional representation in house of representatives election (HRE) and house of councillors election (HCE), i. e. national level electoral data, to calculate the degree of democracy<sup>2</sup>. According to previous studies of democratization, the two most important dimensions of democracy are the degree of participation and the degree of competition (Vanhanen 2003, 2010). The participation variable is voter turnout. Meanwhile, I refer to Vanhanen's (2003) dimension of competition. Vanhanen (2003) calculated the value of the competition variable by subtracting the percentage of votes won by largest party from 100. I apply the competition variable to this paper, and calculate the value of competition by subtracting the percentage of votes won by the party in municipality from 100.

I use the data of Nihon Keizai Shinbun's Sangyō Chiiki Kenkyūjo's (Research Institute of Industry and Regional Economy at Nikkei Inc.) *Zenkokushiku no Gyousei Hikaku Chōsa dēta Syū (Data of Comparative Survey for the Administration of Cities and Wards in Japan)* as efficiency and public services variables. The data includes in the comprehensive evaluation of administrative reform as efficiency variable, and the comprehensive evaluation of public service as public services variables. The comprehensive evaluation of administrative reform consists of four variables: evaluation of transparency, evaluation of efficiency and vitalization, evaluation of public participation, and evaluation of convenience. The comprehensive evaluation of public service consists of five variables: child care environment, elderly

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<sup>2</sup> The reason is that number of candidate is different by municipalities in mayoral election and assembly elections, and it affects political competition and voter turnout.

care, education, public utility charges, and public housing and infrastructure. Therefore, the data is useful in available data for the measurements of efficiency and public services of municipalities in Japan. Table 3 summarizes the data for independent variable.

Table 3: Data for Dependent Variables

No	Variables		Fiscal Year	Source
1	Participation (HRE)	Voter Turnout	2005, 2009, 2012	<i>LDP JED-M Data</i>
2	Competition (HRE)	The value is calculated By subtracting the percentage of votes won by the party in municipality from 100.		
3	Participation (HCE)	Voter Turnout	2004, 2007, 2010	<i>asahi.com de miru Saninsen no Subete</i> [the House of Councilors Election from asahi.com]
4	Competition (HCE)	The value is calculated By subtracting the percentage of votes won by the party in municipality from 100.		
5	Comprehensive Evaluation of Administrative Reform	The value is Calculated from variable 6 to variable 9.	2004 · 2006 · 2008	<i>Zenkokushiku no Gyousei Hikaku Chōsa dēta Syū</i> [Data of Comparative Survey for the Administration of Cities and Wards in Japan]
6	Evaluation of Transparency			
7	Evaluation of Efficiency and Vitalization	The value is calculated from variable 11 to variable 15.		
8	Evaluation of Public Participation			
9	Evaluation of Convenience			
10	Comprehensive Evaluation of Public Services			
11	Child Care Environment			
12	Elderly Care			
13	Education			
14	Public Utility Charges			
15	Public Housing and Infrastructure			

Note: All Variables are standardized by Z-score.

### 3. Analysis Results

As Table 3 shows, I can use the data of HRE in FY2005, 2009, and 2012, HCE in FY2004, 2007, and 2010, and *Zenkokushiku no Gyousei Hikaku Chōsa dēta Syū* in FY2004, 2006, and 2008 for analysis. I estimate the effects of municipal mergers on administrative Reform and public services after two years and four years from FY2004. Similarly, I estimate the effects of municipal mergers on participation and competition (HCE) after three years and six years from FY2004, and participation and competition (HRE) after four Years and seven years from FY 2005. In order to estimate the effect, when I estimate the effect on respective dependent variable, I add the corresponding variable in FY2004 or FY2005 to covariates. For instance, when I estimate the effect of municipal mergers on administrative reform in FY2006 and 2008, I add the variable of administrative reform in FY2004.

Table 4: Effect of Municipal Mergers on Administrative Reform

	Municipal Mergers	
	Effect After Two Years	Effect After Four Years
Comprehensive Evaluation of Administrative Reform	0.12254	0.24188
	0.1895	0.20593
	68	68
Evaluation of Transparency	0.12785	0.35572*
	0.19339	0.19153
	68	68
Evaluation of Efficiency and Vitalization	-0.21521	0.060255
	0.19011	0.20988
	68	68
Evaluation of Public Participation	-0.11705	-0.062287
	0.20557	0.20122
	68	68
Evaluation of Convenience	0.30772	0.22505
	0.23083	0.2393
	68	68

Significant levels: \*\*\*<0.01; \*\*<0.05; \*<0.1.

Note: First line is estimate; Second line is standard error; Third line is matched number of observations.



Table from 4 to 7 summarized the findings. Table 4 shows positive and statically significant effects of municipal mergers on transparency after four years. Therefore, I suggest that municipal mergers increase transparency in future.

Table 5: Effect of Municipal Mergers on Public Service

	Municipal Mergers	
	Effect After Two Years	Effect After Four Years
Comprehensive Evaluation of Public Services	0.48191***	0.52197***
	0.15274	0.19638
	68	68
Child Care Environment	0.45812**	0.40731**
	0.20109	0.19944
	68	68
Elderly Care	0.31589	-0.1897
	0.21777	0.20396
	68	68
Education	0.32374*	0.058091
	0.17649	0.19812
	68	68
Public Utility Charges	0.36042**	0.55643***
	0.17874	0.21138
	68	68
Public Housing and Infrastructure	-0.28627	-0.11964
	0.19887	0.232
	68	68

Significant levels: \*\*\*<0.01; \*\*<0.05; \*<0.1.

Note: First line is estimate; Second line is standard error; Third line is matched number of observations.

Table 5 shows positive and statically significant effects of municipal mergers on public services, child care environment, education, public utility charges. Conversely, it does not show statically significant effects of municipal mergers on elderly care, and public housing and infrastructure. Therefore, municipal mergers increase public services except elderly care, and public housing and infrastructure.

Table 6: Effect of Municipal Mergers on Participation and Competition (HCE)

	Municipal Mergers	
	Effect After Three Years	Effect After Six Years
Participation	-0.04089	-0.061825
	0.097306	0.09131
	197	197
Competition	0.21462**	0.31663***
	0.094757	0.099467
	197	197

Significant levels: \*\*\*<0.01; \*\*<0.05; \*<0.1.

Note: First line is estimate; Second line is standard error; Third line is matched number of observations.

Table 7: Effect of Municipal Mergers on Participation and Competition (HRE)

	Municipal Mergers	
	Effect After Four Years	Effect After Seven Years
Participation	0.15467*	0.075911
	0.085693	0.080969
	284	284
Competition	-0.11636	0.11952
	0.10353	0.091331
	284	284

Significant levels: \*\*\*<0.01; \*\*<0.05; \*<0.1.

Note: First line is estimate; Second line is standard error; Third line is matched number of observations.

Table 6 shows positive and statically significant effects on competition. However, Table 7 does not show statically significant effects on competition. Conversely, Table 7 shows positive and statically significant effects on participation after four years. However, Table 6 does not show statically significant effects on participation. Therefore, although the result is limited, I suggest neutral or positive effect of municipal mergers on democracy.

## 4. Conclusion

I have examined the effects of municipal mergers on democracy, efficiency, and public services in Japan, using propensity score analysis. The result of my examination is as follows. First, municipal mergers increase transparency in future. Second, municipal mergers increase public services except elderly care, and public housing and infrastructure. Third, municipal mergers bring the neutral or positive effect on democracy.

However, although the result is limited, further consideration will be needed to yield any findings about the effect of municipal mergers.

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