Merging Local Governments and Strategic Debt Formation

－A Positive Analysis Using Japanese Municipal Data －

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Abstract

One merger incentive for local governments is the potential to free ride on merger partners. A successful merger allows a local government facing fiscal difficulties to push off onto its merger partners the responsibility for improving finances that it would have born on its own. Merger can be expected to increase the mutual free-riding incentives on local governments if the local financial structures include inter-government transfers of accounts. This will reduce the motivation to improve financial health and efficiency in advance of the merger.

This paper uses empirical approaches to identify the existence of free-riding incentives in municipalities that merged during the "Great Heisei Mergers." More specifically, it focuses on the issuing of local government bonds by pre-merger municipalities and uses cross-section data broken down by municipality to empirically analyze whether there were an incentives for "strategic debt formation" by individual local governments in the form of public bond issues in expectation of their becoming the shared obligations of the merger partners.

1. Introduction

Much of the research into changes in local government boundaries resulting from merger focuses on verifying the economic impact of mergers based on the criteria of spending cuts and minimal efficient scale (Hanes [2003], Dolley et al. [2007], Geys et al. [2007], Hayashi [2002], Uemura and Sumi [2003] et al.), but recent years have seen studies into the factors that influence decisions to merge or not merge (Sorensen [2006], Hirota [2007], Miyashita and Nakazawa [2009] et al.), and others have focused on the incentives on local governments as they prepare for merger (Hinnerich [2009], Jordahl and Liang [2010], Nishikawa [2002], Miyazaki [2006 a] [2006 b] et al.).

Moving through the period that has come to be known as the "Great Heisei Mergers (Heisei-no-Daigappei)," Japan entered the 2000s having made substantial progress in municipal mergers, and began to accumulate significant amounts of empirical analysis not only on the economic impact of expenditure- cut-focused mergers, but also the impact on merger of the attributes of the municipalities themselves and the programs provided at the central government level. In addition to fundamental attributes like population (rate of demographic aging), land area, fiscal condition and local industrial structure, the merger incentives for local governments also presumably include institutional factors like the potential to expand authority (achieve a higher municipality ranking, etc.) and fiscal support measures provided by central government that encourage merger.

One merger incentive for local governments is the potential to free ride on merger partners. A successful merger allows a local government facing fiscal difficulties to push off onto its merger partners the responsibility for improving finances that it would have born on its own. Merger can be expected to increase the mutual free-riding incentives on local governments if the local financial structures include inter-governmental transfers of accounts. This does not merely reduce the motivation to improve financial health and efficiency in advance of the merger, but in some cases may actually result in a worsening of finances instead.

Research in other countries on the free-riding phenomenon in merger include Baqir (2002), Bradbury and Stephenson (2003), Hinnerich (2009), and Jordahl and Liang (2010). There has been no empirical analysis on municipal merger performed in Japan. The local financial structure in Japan includes significant fiscal transfers from the central government to the local government, and it is therefore meaningful to verify the extent of free-riding as one of the negative aspects of merger.

Working from these concerns, this paper uses empirical approaches to identify the existence of free-riding incentives in municipalities that merged during the "Great Heisei Mergers." More specifically, it focuses on the issuing of local government bonds by pre-merger municipalities and uses cross-section data broken down by municipality to empirically analyze whether there were an incentives for "strategic debt formation" by individual local governments in the form of public bond issues in expectation of their becoming the shared obligations of the merger partners.

This paper is structured as follows. Section 2 contains an overview of the course of municipal mergers in Japan in recent years, and a discussion of major merger promotion programs. Section 3 uses empirical approaches to identify the free-riding incentives on pre-merger municipalities, focusing on the issue of local government bonds. Section 4 summarizes the paper's conclusions and identifies topics remaining to be addressed.

2. Great Heisei Mergers: History and Supporting Policies

The surge in municipal-level mergers that began in FY1999 has come to be known as the "Great Heisei Mergers" (Heisei-no-Daigappei). As can be seen from Chart 2-1-1, the number of municipalities in Japan was virtually havled between the end of FY1999 (3,229) and the end of FY2005 (1,821). By the end of FY2009, it had further declined to 1,727. These numbers give some indication of the scale at which municipal mergers proceeded over the last decade or so.

The mergers were ostensibly voluntary decisions by municipalities wishing to stem the loss of vitality and the worsening fiscal condition resulting from declining population. The word "ostensibly" is used to describe this because municipalities desiring to merge could only begin the formal process after establishing a "statutory municipal merger consultative council" to discuss the merger, which required a decision to establish the council either by the municipal legislature or by resident referendum. Nonetheless, the reason for such a high concentration of large mergers during this period of time is because of the substantial push they were given through a number of central government-level merger promotion programs.

The central government position of promoting municipal mergers can be seen from the expansion in merger promotion programs, primarily fiscal support measures, incorporated into two laws. The Act on Special Provisions for the Merger of Municipalities ("old Act on Exceptional

Measures on Municipal Mergers") covered municipalities merging during the 1999-2005 period; the Act on Special Provisions, etc. for the Merger of Municipalities ("new Act on Exceptional Measures on Municipal Mergers") municipalities merging during the 2006–2009 period. Chart 2-1-2 contains an overview and comparison of merger promotion programs included in these laws.

Chart 2-1-1 Numbers of Municipal Mergers and Numbers of Municipalities

FY	Number of mergers	Number of municipalities
FY1999	1	3,229
FY2000	2	3,227
FY2001	3	3,223
FY2002	6	3,212
FY2003	30	3,132
FY2004	215	2,521
FY2005	325	1,821
FY2006	12	1,804
FY2007	6	1,793
FY2008	12	1,777
FY2009	30	1,727

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Fiscal support measures and other merger promotion programs served as significant merger incentives, as can be seen from the number of mergers in FY2005 (325), the final year of the old Act

on Exceptional Measures on Municipal Mergers, and the number of merger in FY2009 (30), the final year of the new Act (Chart 2-1-1). These numbers indicate that municipalities rushed to merge before the termination of merger support programs, and the sharp decline in mergers in FY2009 compared to FY2005 presumably reflects the rollback and reduction of fiscal support measures under the new Act on Exceptional Measures on Municipal Mergers.

Chart 2-1-2 Major Merger Promotion Programs in the New and Old Acts on Exceptional Measures on Municipal Mergers

Merger promotion program	Old Act on Exceptional Measures on Municipal Mergers	New Act on Exceptional Measures on Municipal Mergers
Eligible mergers	Implemented by the end of March 2006	Implemented by the end of March 2010
Resident referendum to establish a municipal merger consultative council	✓	✓
Special exceptions on number of assembly members and terms	✓	✓
Special computations for local public bodies (Guarantee of pre-merger levels of the amount of local allocation tax)	10 years	5 years (*) * 9 years for mergers in 2005–2006 7 years for mergers in 2007–2008 5 years for mergers in FY2009
Special bonds for post-merger projects (Local allocation tax measure to redeem 70% of principal and interest) (10 years after merger)	✓	–

The fiscal support measures themselves apply only to the new municipality after merger and have no direct benefits for the old municipalities before merger. Nonetheless, they can be assumed to

nudge municipalities towards merger by guaranteeing future benefits. Municipalities planning to merge can also enjoy other benefits of the merger outside of the fiscal support measures under the new and old Acts on Exceptional Measures on Municipal Mergers by increasing their issuing of local government bonds prior to the merger. The next section focuses on this point in an empirical analysis of free-riding incentives as evidenced by the issuing of local government bonds (other than special bonds for post-merger projects) by pre-merger municipalities.

3. Empirical Analysis

This empirical analysis covers municipal mergers from FY1999 onwards in which amendments to the Act on Exceptional Measures on Municipal Mergers, including fiscal support measures, set the stage for an increase in mergers. The expectation is that more generous merger promotion programs exacerbated the problem of free-riding by merging municipalities. To verify this, this paper uses a cross-section data by municipality for FY2005, the final year of the old Act on Exceptional Measures on Municipal Mergers, and for FY2009, the final year of the new Act on Exceptional Measures on Municipal Mergers. The outstanding local government debt multiple is regressed with variables expressing the free-riding incentives on municipalities to verify whether there were incentives for "strategic debt formation," i.e., an increase in the issuing of public bonds by individual municipalities with the expectation that they would become a shared obligation of the merger partners.

Section 3-1 begins by describing the model and empirical framework. Section 3-2 describes the data used in estimations. Section 3-3 discusses the results, their interpretation, and their policy implications.

3-1. Empirical framework

This study uses a linear regression model based on the "difference-in-difference" approach such as Hinnerich (2009) to verify the free-riding incentives on pre-merger municipalities in the form of local government bond issuing.

$$y_i = \alpha_0 + \beta_1 x_i + \beta_2 d_1 x_i + \beta_3 d_1 d_2 x_i + \sum_{k=1}^{3} \gamma_k z_i^k + u_i \qquad (1)$$

Explained variable y_i expresses the difference (year before merger − FY1998) in the outstanding local government debt rate (outstanding local government debt divided by standard fiscal scale) of the old municipality. Explanatory variable x_i is 1 minus the old municipality's share of the population of the new municipality, and serves as a proxy variable to express the free-riding incentives on the old municipality. The larger the value of x_i, the smaller the municipality's population share in the new municipality, and the larger the presumed free-riding incentive. z_i^k expresses other factors influencing the outstanding local government debt rate. This study posits four factors: the difference in the municipality's ratio of revenues transferred from the central government and the prefectural government to total revenues (year before merger − FY1998), rate of change in per capita local taxes from 1998 to the year before merger, rate of change in per capita taxable income for the same period, and land area of the municipality. u_i expresses error terms and satisfies $u_i \sim N(\mu, \sigma^2)$.

To more clearly verify the debt-increase incentives on merged municipalities, data from both merged municipalities and unmerged municipalities was used in Equation (1) with expected coefficient dummy made up of a dummy variables d_1 of 1 for merged and 0 for unmerged to identify the differences in the debt formation incentives for merged and unmerged municipalities. In addition, a dummy variable d_2 was also used for the establishment of a municipal merger consultative council; merged municipalities holding a resident referendum on establishment were assigned the value of 1, those not holding a referendum, 0. This enables verification of the debt formation incentives on merged local governments from the implementation of a resident referendum.

If the incentive to increase the issuing of local government bonds in expectation of the responsibility for redemption being shared as a result of merger (incentive to strategic debt formation) is stronger in a municipality with a relatively small population, the sign for $\beta_1 + \beta_2$ will be significantly positive, and it can be concluded that merger exerted free-riding incentives on the municipality. In addition, β_3 could have either a positive or a negative sign, but if significantly negative would be interpreted as indicating that municipalities that held resident referendums had

relatively less incentive to increase debt by the merger year than other merged municipalities.

3-2. Data

The estimations with Equation (1) use cross-section data by municipality for the 2005 and 2009 period. This section describes the data used.

The outstanding local government debt rate is calculated by dividing outstanding local government debt found in "Survey of Municipal Budget Settlements" (Ministry of Internal Affairs and Communications, Local Public Finance Bureau) by the standard fiscal scale also found in that document. The difference in the municipal outstanding local government debt rate, which is an explained variable, is calculated as the difference between this value in FY1998 and in the year before merger (FY2004 or FY2008).

The variable indicating free-riding incentive, which is the explanatory variable, is found by calculating the old municipality's share of the population in the new municipality based on population during the merger year as indicated in the basic register of residents (Local Administration Bureau, Ministry of Internal Affairs and Communications), and subtracting this number from 1. As discussed above, the larger this value, the smaller the municipality's share of the population in the new municipality, and the larger the expected free-riding incentive. For unmerged municipalities, an imaginary free-riding incentive variable was calculated using the same approach by identifying potential merger combinations from the tentative municipal merger plans enacted at the prefectural level beginning FY2006 under the new Act on Exceptional Measures on Municipal Mergers, and from mergers that were discussed but failed to be achieved. [1]

The ratio of central government and prefectural government transfers to total municipal revenues is calculated as the total of national government disbursement, prefectural disbursement and the local government's portion of local allocation tax, as found in "Survey of Municipal Budget Settlements," divided by total revenue. The difference in this ratio, which is an explanatory variable, is calculated as the difference between FY1998 in the year before merger (FY2004 were FY2008).

[1] The author created his own groups based on the voluntary municipal merger combinations established at the prefectural level (tentative municipal merger plans) and combinations of municipalities that had discussed merger in the past. It likewise examined municipalities for which there were no moves towards merger in FY1999 or thereafter. For these municipalities, a value of 0 was assigned to the free-riding incentive variable, and 1 to population share.

Per capita local taxes are calculated by dividing the local tax amount found in "Survey of Municipal Budget Settlements" by population as found in the "basic register of residents;" per capita taxable income by dividing taxable income as found in "Survey of Municipal Taxation" (Ministry of Internal Affairs and Communications, Local Tax Bureau) by population. Their rates of change are calculated as the rates of change from FY1998 until the year before merger. For land area, the municipality's value for the year of merger as found in "National Survey of Land Areas by Prefecture and Municipality" (Geospatial Information Authority of Japan) was used. The information providing the basis for the creation of dummy variables was obtained from the "Merger Digital Archive" (Local Administration Bureau, Ministry of Internal Affairs and Communications).

3-3. Results and interpretation

This section provides the results of the regression analysis in Equation (1) and interprets the findings. See Charts 3-3-1 and 3-3-2 for the results. Chart 3-3-1 shows the results for municipalities that merged in FY2005; Chart 3-3-2, for municipalities that merged in FY2009. Both charts show (a) cases in which there was no resident referendum held on the establishment of a municipal merger consultative council, and (b), cases in which the resident referendum was held. Below this paper examines the statistical significance of the results and interpret them.

Chart 3-3-1 contains the regression analysis for merged municipalities in FY2005. The free-riding indicator (β_1) is significantly positive for both (a) and (b). The free-riding indicator (β_2), which expresses whether merger took place, is also significantly positive for both (a) and (b). $\beta_1 + \beta_2$ also being positive, it can be determined that for municipalities merging in FY2005, the smaller a local government's share of the population in the new, merged municipality (the larger the free-riding indicator), the stronger the free-riding incentive from merger. For both merged and unmerged municipalities, there is no change in the finding that the smaller a local government's relative population the greater the incentive to increase the outstanding local government debt rate between FY1998 (prior to enactment of the old Act on Exceptional Measures on Municipal Mergers) and FY2004 (year before merger), but the debt-increase incentive was nearly twice as strong for merged municipalities than unmerged municipalities according to the regression analysis.

Chart 3-3-1 Estimation Results for Merged Municipalities in FY2005

Parameter (name of variable)	(a) Resident voting dummy No	(b) Resident voting dummy Yes
α_0 (constant term)	0.287*** (0.000)	0.286*** (0.000)
β_1 (free-riding indicator)	0.132*** (0.000)	0.133*** (0.000)
β_2 (merger dummy×free-riding indicator)	0.133*** (0.000)	0.140*** (0.000)
β_3 (merger dummy×resident voting dummy×free-riding indicator)	—	-0.230** (0.040)
γ_1 (fiscal transfer ratio)	-1.134*** (0.000)	-1.124*** (0.000)
γ_2 (rate of change in per capita local taxes)	-0.210*** (0.010)	-0.211*** (0.009)
γ_3 (rate of change in per capita taxable income)	0.683*** (0.000)	0.676*** (0.000)
γ_4 (land area)	0.305E-03*** (0.000)	0.303E-03*** (0.000)
AdjR^2	0.079	0.081
Number of samples	2144	2144

Note 1: *** indicates a significance level of 1% on both sides; ** a significance level of 5% on both sides, and * a significance level of 10% on both sides.
Note 2: Values in parentheses for parameters indicate p-values; AdjR2 indicates the coefficient of determination adjusted for degree of freedom.

Turning to Chart 3-3-2, which contains results for merged municipalities in FY2009, both the free-riding indicator (β_1) and the free-riding indicator adjusted for merger (β_2) are significantly positive for both (a) and (b). Like Chart 3-3-1, $\beta_1 + \beta_2$ is positive, and it can therefore be concluded that for municipalities merging in FY2009 as well, the smaller a local government's share

of the population in the new, merged municipality (the larger the free-riding indicator), the stronger the free-riding incentive from merger. Like FY2005, estimations for FY2009 indicate that for both merged and unmerged municipalities, the smaller the relative size of the local government's population, the stronger the incentive to increase the outstanding local government debt multiple, and in this case the debt-increase incentive for merged municipalities was nearly triple that for unmerged municipalities.

Comparing estimation results for FY2005 and FY2009, the former's $\beta_1 + \beta_2$ value is higher than the latter's. As discussed in Section 2, merger support programs under the old Act on Exceptional Measures on Municipal Mergers, which were in effect until FY2005, offered local governments more generous options of support than did merger support programs under the new Act on Exceptional Measures on Municipal Mergers, which were in effect until FY2009. Therefore, the free-riding incentives for municipalities preparing for merger under the old Act on Exceptional Measures on Municipal Mergers were relatively higher than those for municipalities preparing for merger under the new Act on Exceptional Measures on Municipal Mergers. The results from the regression analysis can be interpreted as reflecting differences between the merger support programs in the two periods.

Examining the value for the free-riding indicator adjusted for resident referendum (β_3), both FY2005 and FY2009 show negatives, but only FY2005's is significant. When the sign of β_3 is negative, it indicates that resident referendum has secured the commitment residents to discussing merger, which strengthens the mutual resident oversight functions of local governments on actions that would increase debt, and therefore weakens the free-riding incentive compared to merged local governments that did not hold resident referendums. For merged municipalities in FY2005, mutual checks in the form of resident monitoring can be interpreted as constraining debt-increase incentives on merging local governments, but for FY2009, there was no statistically significant constraint on debt-increase incentives found. This may indicate that the enactment of the new Act on Exceptional Measures on Municipal Mergers, with its reduced merger support programs, brought a greater degree of fiscal discipline on all municipalities preparing for merger, which reduced the advantages of resident oversight functions resulting from resident referendums.

From Charts 3-3-1 and 3-3-2, it can be seen that, among other variables, the fiscal transfer ratio is significantly negative for both sets of results, the rate of change in per capita local taxes is also

significantly negative, and per capita taxable income is significantly positive, all of which satisfy sign conditions. For land area, both FY2005 and FY2009 results are positive, but only FY2005 has significance. At the very least, for FY2005, the expansion in land area appears to have been a factor for the increase in local government bond issuing for municipalities.

Chart 3-3-2 Estimation Results for Merged Municipalities in FY2009

Parameter (name of variable)	(a) Resident voting dummy No	(b) Resident voting dummy Yes
α_0 (constant term)	-0.502 (0.139)	-0.504 (0.138)
β_1 (free-riding indicator)	0.073* (0.071)	0.073* (0.071)
β_2 (merger dummy×free-riding indicator)	0.142** (0.048)	0.149** (0.041)
β_3 (merger dummy×resident voting dummy×free-riding indicator)	—	-0.311 (0.519)
γ_1 (fiscal transfer ratio)	-1.124*** (0.000)	-1.127*** (0.000)
γ_2 (rate of change in per capita local taxes)	-0.152*** (0.000)	-0.152*** (0.000)
γ_3 (rate of change in per capita taxable income)	0.369*** (0.023)	0.369*** (0.024)
γ_4 (land area)	0.103E-03 (0.165)	0.103E-03 (0.165)
$AdjR^2$	0.050	0.049
Number of samples	1202	1202

Note 1: *** indicates a significance level of 1% on both sides; ** a significance level of 5% on both sides, and * a significance level of 10% on both sides.
Note 2: Values in parentheses for parameters indicate p-values; AdjR2 indicates the coefficient of determination adjusted for degree of freedom.

These findings can be summarized into the following three points. First, under the old (new) Act on Exceptional Measures on Municipal Mergers, the debt-increase incentive on municipalities preparing for merger was more than double (triple) than on unmerged municipalities. Second, municipalities merging in FY2005 under the old Act on Exceptional Measures on Municipal Mergers had stronger debt-increase incentives than municipalities merging in FY2009 under the new Act on Exceptional Measures on Municipal Mergers. Third, only for municipalities merging FY2005, resident oversight functions resulting from resident referendums worked to weaken the debt-increase incentives on merging municipalities. The empirical analysis performed in this study indicates that there were incentives for "strategic debt formation" on municipalities preparing for merger in response to the merger support programs offered under the new and old Acts on Exceptional Measures on Municipal Mergers. This took the form of an increase in the issuing of public bonds on the expectation that they would become shared obligations of merger partners.

4. Conclusions

This paper began with the expectation that the generous merger support programs provided by the central government would exacerbate the problem of free-riding by merging municipalities, and used empirical approaches to verify that expectation and discover if municipalities that merged beginning FY1999, when amendments to the Act on Exceptional Measures on Municipal Mergers put new fiscal support measures and other merger programs in place, experienced free-riding incentives regarding debt formation. To do this, it used cross-section data by municipality for FY2005, the final application of measures under the old Act on Exceptional Measures on Municipal Mergers, and FY2009, the final year of measures under the new Act on Exceptional Measures on Municipal Mergers, performed a regression for the outstanding local government debt rate as a proxy variable for the free-riding incentive on municipalities and examined whether there were incentives for "strategic debt formation" in the form of increased issues of public bonds on the expectation that they would become shared obligations of merger partners.

The results of the empirical analysis clarify three points. First, coefficients for the free-riding indicators on merged municipalities ($\beta_1 + \beta_2$) were either double (FY2005) or triple (FY2009) coefficients for free-riding indicators on unmerged municipalities (β_1). The old (new) Act on

Exceptional Measures on Municipal Mergers therefore had more than double (triple) the debt-increase incentive on municipalities preparing for merger than on unmerged municipalities.

Second, the coefficients for free-riding indicators ($\beta_1 + \beta_2$) were higher for municipalities merging in 2005 than in 2009. Municipalities merging in FY2005 under the old Act on Exceptional Measures on Municipal Mergers therefore had stronger debt-increase incentives than municipalities merging in FY2009 under the new Act on Exceptional Measures on Municipal Mergers.

Third, coefficients for free-riding indicators on municipalities holding resident referendums on the establishment of a municipal merger consultative council (β_3) were significantly negative for municipalities merging in FY2005, and therefore, with respect to FY2005 only, the resident oversight functions resulting from resident referendums worked to weaken debt-increase incentives on merging municipalities.

The empirical analysis performed in this paper clarifies the effect of free-riding incentives for the issuing of local government bonds on municipalities preparing for merger under the merger promotion programs put in place with amendments to the Act on Exceptional Measures on Municipal Mergers. The empirical analysis performed in this study indicates that there were incentives for "strategic debt formation" on municipalities preparing for merger in response to the merger support programs offered under the new and old Acts on Exceptional Measures on Municipal Mergers. This took the form of an increase in the issuing of public bonds on the expectation that they would become shared obligations of merger partners.

Finally, there are two issues not addressed in this paper. The first is adjustment for the unique characteristics of the municipalities that form the sample in the analysis. The focus of this paper was on identifying the differences in the debt formation incentives for merged municipalities and unmerged municipalities, and it did not sufficiently adjust for the unique aspects of individual municipalities. There has, for example, been no attempt to account for the differences between cities on the one hand and towns and villages on the other, or among cities, between special case cities, core cities and ordinance-designated cities on the one hand and other cities on the other. Nor has there been any accounting for the differences in the form of merger, specifically, whether the merger resulted in the establishment of a new municipality or incorporation into an existing municipality. It will be necessary to perform analysis that accounts for the unique aspects of data by adding a constant term dummy and coefficient dummy. That is an issue for the future.

Second, the scope of analysis needs to be widened with a more diversified data sample. This paper analyzed only the free-riding incentives in debt formation, but obviously, there are other potential forms of free-riding besides local government bonds. There is space for free-riding in, for example, payroll expenses, spending on ordinary construction projects, or the balances remaining in funds. In addition, this paper analyzed data for FY2005 and FY2009 because of the increases in mergers in the final years of the new and old Acts on Exceptional Measures on Municipal Mergers, but it will be important to perform similar empirical analysis for other years, even acknowledging the disadvantages of insufficient data, to verify whether the conclusions reached in this paper remain applicable. This also is an issue for the future.

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Resource Data

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