The Impact of Amalgamation on the Fiscal Soundness of Municipalities:

An Experience from Japan

[Draft]

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Abstract

During the period of 1999 to 2007, Japanese central government developed a promotion policy to amalgamate municipalities. This policy is referred to "Municipal Merger in Heisei Era". The policy encouraged municipal amalgamations, using a fiscal incentive, which gives subsidies to amalgamated municipalities. This amalgamation policy succeeded in reducing the number of municipalities from 3,229 to 1,801 during that period.

This paper studies a fiscal impact of this amalgamation policy on a fiscal soundness of municipalities. In order to achieve this purpose, this paper tests whether there are statistical differences in fiscal soundness between the amalgamated municipalities and non-amalgamated municipalities, using municipal's fiscal data.

Our results show that a fiscal soundness of non-amalgamated municipalities is statistically better than that of amalgamated municipalities. This result has the following three suggestions. First, although succeeding in the reduction of the number of municipalities, the amalgamation policy did not achieve an improvement of fiscal soundness of municipalities. Second suggestion is that only the municipalities whose fiscal soundness is weak amalgamated. Last, a service provision of municipalities does

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not have scale-economy.

Key words: municipal amalgamation, fiscal soundness, local government, scale economy

JEL: H72, H83

1. Introduction

In Japan, the number of municipalities has decreased sharply from 3,229 in 1999 to 1,727 in 2010. This large reduction were resulted from the policy of "Municipal Merger in Heisei Era" promoted by the national government. Japanese national government argued that amalgamations of municipalities can strengthen their financial bases through realizing scale economies in administrative expenses. This promotion policy of municipal amalgamation started from 1999, and the movement of amalgamations was peaked from 2003 to 2005 and the reduced number of municipalities was 1,391 during this period. This paper examines whether or not there are differences in fiscal situations between the amalgamated municipalities and non-amalgamated municipalities and shows whether or not the municipal amalgamations through the policy of "Municipal Merger in Heisei Era" have positive effects on municipal financial soundness,

A lot of countries have encouraged municipal amalgamations to decrease per capita expenditure and realize scale economies in providing local public services. However, in contrary to the argument of municipal administrations, recent findings are not necessarily favorable the financial merits through municipal amalgamations.

Drew et al. (2012) examined whether there are scale economies in local government outlays by analyzing the expenditure of local governments in Australia and found that when local governments are decomposed into subgroups on the basis of population density, the evidence of scale economies in expenditure disappears. Reiljan et al. (2013) indicated that, in Estonian local governments, the municipal amalgamation does not have an effect on the financial sustainability because the financial sustainability of Estonian municipalities relies on heavily on central governments grants.

Andrews (2013) stated that the amalgamation in England and Wales appears to have weakened the financial sustainability of the amalgamated counties. Slack and Bird (2013) found that the amalgamation does not achieve any visible cost savings in Canada. Drew et al. (2014) examined the existence of a U-shaped relationship between population size and per capita expenditure in Australian local governments, and found that amalgamations increased the proportion of residents operating with diseconomies of scale.

This paper is going to add one finding from an experience in Japan to the above studies. This paper shows that financial indexes of amalgamated municipalities are worse than that those of non-amalgamated municipalities. This paper compares the financial soundness between the amalgamated municipalities and non-amalgamated municipalities comprehensively using some indices as measures of financial soundness.

This paper consists of the following sections. Section 2 provides brief information about the system and facts of municipal finance in Japan and the promotion policy of "Municipal Merger in Heisei Era". Section 3 examines differences in financial soundness between the amalgamated municipalities and non-amalgamated municipalities. We use six indices: real balance ratio, ordinary balance ratio, debt expenditure burden ratio, real debt ratio, financial capability index, and future burden ratio. Using these six indices, we can discuss the effects of amalgamations on financial situations from various aspects, including administrative flexibility at present and in the future. Section 4 discusses our findings and section 5 gives conclusions.

2. The system and fact of financial circumstances of municipalities in Japan

Japanese local governments are divided into two levels: prefectures and

municipalities. Municipalities provide services close to residents' daily life, such as primary education, sewerage system, water supply, child care service, and so on. Table 1 shows municipal expenses by function aggregated at the national level from 1999 to 2010.

Table 1 Municipal Expenditures by function in Japan (1999 to 2010)

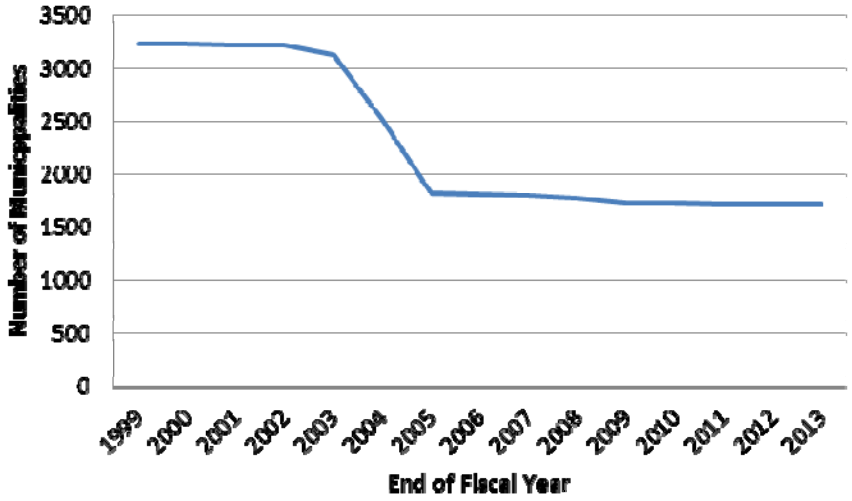
	Public Welfare Expenses		Education Expenses		Debt Expenditure		Civil Engineering Work Expenses		General Administration Expenses		Commerce and Industry Expenses		Sanitation Expenses		Agriculture, Forestry and Fishery Expenses		Other Expenses		Total	
1999	12376.8	(22.9)	6084.0	(11.3)	6273.5	(11.6)	10114.7	(18.7)	6650.7	(12.3)	2207.0	(4.1)	4886.7	(9.0)	2367.7	(4.4)	3057.0	(5.7)	54018.1	(100.0)
2000	10454.7	(20.4)	6073.7	(11.9)	6272.4	(12.3)	9686.6	(18.9)	6504.6	(12.7)	1958.7	(3.8)	5039.7	(9.9)	2222.3	(4.3)	2948.3	(5.8)	51161.0	(100.0)
2001	10908.2	(21.2)	6044.8	(11.8)	6456.0	(12.6)	9317.2	(18.1)	6553.1	(12.7)	1910.0	(3.7)	5222.4	(10.2)	2105.7	(4.1)	2888.5	(5.6)	51405.9	(100.0)
2002	11267.8	(22.3)	5902.5	(11.7)	6557.6	(13.0)	8866.0	(17.6)	6264.2	(12.4)	1798.8	(3.6)	5031.0	(10.0)	1958.0	(3.9)	2780.1	(5.5)	50426.0	(100.0)
2003	11930.6	(24.0)	5634.4	(11.3)	6601.7	(13.3)	8438.2	(16.9)	6436.1	(12.9)	1707.0	(3.4)	4506.7	(9.1)	1817.6	(3.7)	2712.3	(5.4)	49784.6	(100.0)
2004	12474.9	(25.3)	5469.3	(11.1)	6538.6	(13.3)	7859.9	(16.0)	6359.5	(12.9)	1685.8	(3.4)	4428.1	(9.0)	1618.9	(3.3)	2822.7	(5.7)	49257.8	(100.0)
2005	12813.5	(26.1)	5306.7	(10.8)	6805.0	(13.9)	7491.9	(15.3)	6377.1	(13.0)	1612.2	(3.3)	4355.2	(8.9)	1485.1	(3.0)	2814.0	(5.7)	49060.7	(100.0)
2006	13014.4	(27.1)	5213.2	(10.9)	6469.3	(13.5)	7213.1	(15.0)	6133.3	(12.8)	1626.9	(3.4)	4230.3	(8.8)	1382.4	(2.9)	2663.5	(5.6)	47946.5	(100.0)
2007	13544.9	(28.1)	5167.5	(10.7)	6498.9	(13.5)	7059.1	(14.6)	6263.3	(13.0)	1633.6	(3.4)	4171.1	(8.6)	1298.7	(2.7)	2586.1	(5.4)	48223.3	(100.0)
2008	13934.7	(28.8)	5155.7	(10.7)	6489.7	(13.4)	6819.6	(14.1)	6387.2	(13.2)	1725.6	(3.6)	4104.2	(8.5)	1237.1	(2.6)	2534.6	(5.2)	48388.4	(100.0)
2009	14839.1	(28.5)	5563.4	(10.7)	6348.4	(12.2)	6886.3	(13.2)	7927.1	(15.2)	2333.5	(4.5)	4244.8	(8.2)	1312.1	(2.5)	2563.7	(4.9)	52018.4	(100.0)
2010	17002.7	(32.6)	5591.3	(10.7)	6241.1	(12.0)	6427.3	(12.3)	6753.6	(13.0)	2048.1	(3.9)	4266.7	(8.2)	1241.4	(2.4)	2552.0	(4.9)	52124.1	(100.0)

Note: billion yen (%)

Source: Ministry of Internal Affairs and Communications (2010a)

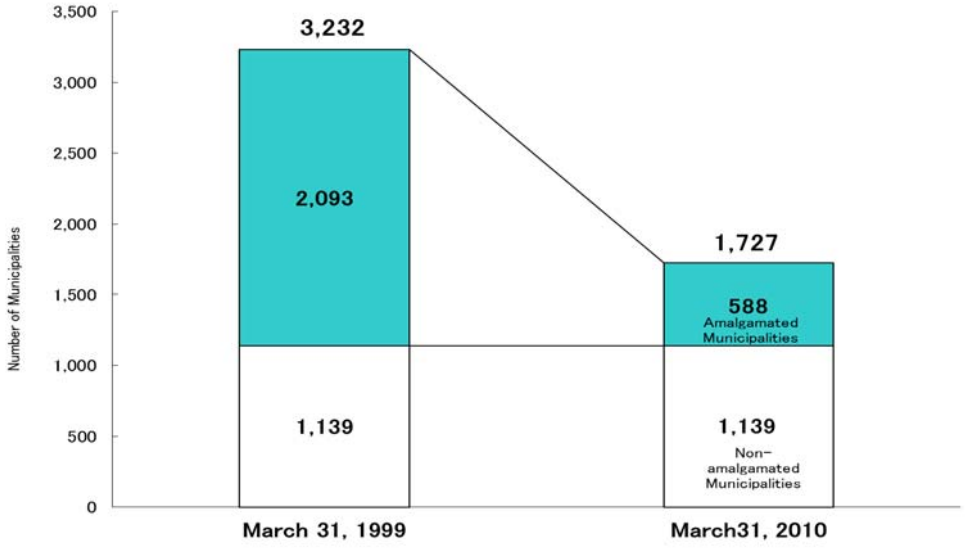
Figure 1 shows changes in the number of municipalities from 1999 to 2013. We can see that the number of municipalities sharply decreased during this period. In particular, the decreasing during the period from 2003 to 2005 was outstanding. Figure 2 shows the number of municipalities related to amalgamations. We can see that during the period from 1999 to 2010, about two-thirds of municipalities amalgamated and reduced to one-thirds.

Figure 1 Change in the Number of Municipalities



Source: http://www.soumu.go.jp/main_content/000283315.xls

Figure 2 Results of Municipal Merger in Heisei Era



Source: http://www.soumu.go.jp/main_content/000178773.xls

Such a large reduction of the number of municipalities was a result of the amalgamation policy of the national government, which was named "Municipal Merger of Heisei Era" after the Japanese name of era. The purpose of the amalgamation policy is to adapt changes in surroundings[2] of municipal service provision and strengthen fiscal foundations in municipalities by achieving scale economies.

Table 2 summarizes a brief outline of the amalgamation policy. The most important mechanism to promote amalgamations is a financial incentive which is delivered from the national government to the amalgamated municipalities. The reason why the number of amalgamation was outstanding from 2003 to 2005 is this financial incentive, which means a special treatment on general subsidy from the national government to amalgamated municipalities.

The results of amalgamations are as follows. During the first period of the amalgamation policy, the number of reduced municipalities is 1,410, the number of newly created municipalities from amalgamations is 581, and the number of amalgamated municipalities is 1,991. During the second period of the amalgamation policy, the number of reduced municipalities is 92, the number of newly created municipalities is 59, and the number of amalgamated municipalities is 151. As a whole, the number of municipalities reduced from 3,232 to 1,727 during the policy period.

3. Data and Method

The purpose of this paper is to examine whether or not there is a difference

[2] Surroundings considered by Japanese government are promotion of decentralization, policy for aging, policy for diversifying, policy for expansion of residential area, and streaming of municipal administration.

between the fiscal soundness in amalgamated municipalities and non-amalgamated municipalities. In order to achieve this purpose, this paper uses a statistical t-test (Student t-test in small samples).

Table 3 Explanation of Financial Index

Financial Index	Details
Real Balance Ratio	The ratio of real balance to standard financial scale
Ordinary Balance Ratio	The ratio of ordinary expenditure to ordinary revenue.
Debt Expenditure Burden Ratio	The ratio of redemption to general resources
Financial Capability Index	The ratio of standard own revenue to standard expenditure
Real Debt Expenditure Ratio	The ratio of real redemption to standard financial scale.
Future Burden Ratio	The ratio of redemption over the future to standard financial scale.

This paper employs six financial indexes as measures of fiscal soundness: real balance ratio, ordinary balance ratio, debt expenditure burden ratio, financial capability index, real debt expenditure ratio, and future burden ratio. All these measures are often used to evaluate fiscal soundness by municipalities in Japan. The meanings of these indexes are shown in Table 2. “Real balance ratio” is the ratio of net revenue to standard financial scale, and hence the larger, the better. “Ordinary balance ratio” means flexibility in financial structure, and hence the smaller, the better. “Debt expenditure burden ratio” is the ratio of redemption to general resources, and hence the lower, the better. “Financial capability index” is the average ratio of standard own revenue to standard expenditure among three years, and hence the larger, the better. “Real debt ratio” is the ratio of real redemption to standard financial scale, and hence the lower, the better. “Future burden ratio” means the ratio of redemption over the future to standard

financial scale, and hence the lower, the better.

In testing differences between the amalgamated municipalities and non-amalgamated municipalities, municipalities are classified into five groups according to population size; large city (over 500,000 population), middle city (over 300,000 population), small city (over 200,000 population), city (under 200,000 population), and town & village.

This paper uses financial data in 2010. Data source is “FY2010 Settlement by Municipalities” issued by Ministry of Internal Affairs and Communications and Table 4 summarizes descriptive statistics of variables.

Table 4 Descriptive Statistics of Variables

Large city	Real Balance Ratio		Ordinary Balance Ratio		Debt Expenditure Burden Ratio		Financial Capacity Index		Real Debt Payment Ratio		Future Burden Ratio	
	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated
Observations	10	9	10	9	10	9	10	9	10	9	10	9
Sum	5.7	22.2	965.3	827.1	217.9	154.5	8.87	7.67	137.1	96.1	1905.1	1026.2
Mean	0.5700	2.4667	96.5300	91.9000	21.7900	17.1667	0.8870	0.8522	13.7100	10.6778	190.5100	114.0222
Std.Dev.	0.4001	2.0543	1.9940	4.4667	2.7256	2.7362	0.1366	0.1091	3.4729	4.1268	51.1603	74.8204
Variance	0.1601	4.2200	3.9761	19.9511	7.4289	7.4867	0.0187	0.0119	12.0609	17.0306	2617.3749	5598.0995
Range	1.2	5.9	6.3	12.1	7.9	8.8	0.38	0.34	11.2	11.6	170.2	221.2
Minimum	0	0.2	93.1	86.1	17.9	12.8	0.69	0.69	10.2	4.3	115.1	30.1
Maximum	1.2	6.1	99.4	98.2	25.8	21.6	1.07	1.03	21.4	15.9	285.3	251.3
Median	0.5	2	96.6	90.2	21.6	17.5	0.9	0.83	12	12.2	194.35	108.9
Kurtosis	-0.8901	-0.7240	-0.7984	-2.0832	-1.3669	-1.1380	-1.6256	-0.8760	0.7388	-1.4652	-0.5840	-0.1618
Skewness	0.3616	0.8206	-0.1123	0.2096	0.3006	-0.0206	-0.2527	0.3908	1.2886	-0.4114	0.1432	1.0270
Std. Error	0.1265	0.6848	0.6306	1.4889	0.8619	0.9121	0.0432	0.0364	1.0982	1.3756	16.1783	24.9401
C. V.	0.7020	0.8328	0.0207	0.0486	0.1251	0.1594	0.1540	0.1280	0.2533	0.3865	0.2685	0.6562

Middle city	Real Balance Ratio		Ordinary Balance Ratio		Debt Expenditure Burden Ratio		Financial Capacity Index		Real Debt Payment Ratio		Future Burden Ratio	
	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated
Observations	13	27	13	27	13	27	13	27	13	27	11	25
Sum	43	92.9	1182.4	2399.4	210.7	459.6	10.75	21.14	108.1	279.2	1063.2	2525.2
Mean	3.3077	3.4407	90.9538	88.8667	16.2077	17.0222	0.8269	0.7830	8.3154	10.3407	96.6545	101.0080
Std.Dev.	1.8470	2.0755	4.1663	3.8890	4.1799	4.2096	0.1364	0.2157	3.5944	3.8627	42.1718	52.8841
Variance	3.4115	4.3076	17.3579	15.1244	17.4715	17.7210	0.0186	0.0465	12.9198	14.9202	1778.4625	2796.7239
Range	6.6	9.8	12.3	15.1	14.5	22.7	0.52	1.11	12	19.2	154.4	201.9
Minimum	0	0.1	84	80.7	8.7	7.9	0.5	0.47	0.4	0	28.6	21.8
Maximum	6.6	9.9	96.3	95.8	23.2	30.6	1.02	1.58	12.4	19.2	183	223.7
Median	3.6	2.9	91.8	88.4	16.3	16.7	0.81	0.78	9	11.3	89.2	96.9
Kurtosis	-0.5638	1.8153	-1.3810	-0.4881	-0.8090	3.2435	1.2756	5.7134	0.7545	1.3643	0.3508	0.2474
Skewness	-0.1991	0.9445	-0.2509	-0.0859	-0.0935	0.7111	-0.6817	1.8450	-1.2211	-0.6943	0.6983	0.6086
Std. Error	0.5123	0.3994	1.1555	0.7484	1.1593	0.8101	0.0378	0.0415	0.9969	0.7434	12.7153	10.5768
C. V.	0.5584	0.6032	0.0458	0.0438	0.2579	0.2473	0.1650	0.2754	0.4323	0.3735	0.4363	0.5236

Small city	Real Balance Ratio		Ordinary Balance Ratio		Debt Expenditure Burden Ratio		Financial Capacity Index		Real Debt Payment Ratio		Future Burden Ratio	
	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated
Observations	20	21	20	21	20	21	20	21	20	21	17	21
Sum	72.2	103.4	1827.5	1821.7	277	322	18.76	17.41	139.2	241.6	1187.9	1968.2
Mean	3.6100	4.9238	91.3750	86.7476	13.8500	15.3333	0.9380	0.8290	6.9600	11.5048	69.8765	93.7238
Std.Dev.	2.4787	2.8127	5.1616	4.1269	3.2867	2.2852	0.1564	0.1767	3.8367	3.1310	35.6111	34.9049
Variance	6.1439	7.9113	26.6419	17.0311	10.8025	5.2222	0.0245	0.0312	14.7204	9.8033	1268.1500	1218.3523
Range	7.6	11.8	21.1	17.3	10.9	7.7	0.71	0.57	13.6	10.5	128.7	125.6
Minimum	0.3	1.4	76.4	78.6	9.2	12	0.6	0.52	0.3	6.2	13.5	31.4
Maximum	7.9	13.2	97.5	95.9	20.1	19.7	1.31	1.09	13.9	16.7	142.2	157
Median	3.2	4.6	92.75	87.8	14.05	15.8	0.955	0.86	7.7	11.5	69.5	86.6
Kurtosis	-1.3354	2.7247	2.0965	-0.1262	-0.9138	-0.8552	0.6807	-1.0858	-0.8084	-1.0880	-0.5358	-0.5143
Skewness	0.3947	1.4472	-1.3867	-0.0502	0.4142	0.2750	-0.0673	-0.2029	-0.2680	0.2530	0.1054	0.0940
Std. Error	0.5543	0.6138	1.1542	0.9006	0.7349	0.4987	0.0350	0.0386	0.8579	0.6832	8.6370	7.6169
C. V.	0.6866	0.5712	0.0565	0.0476	0.2373	0.1490	0.1667	0.2131	0.5513	0.2722	0.5096	0.3724

City	Real Balance Ratio		Ordinary Balance Ratio		Debt Expenditure Burden Ratio		Financial Capacity Index		Real Debt Payment Ratio		Future Burden Ratio	
	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated
Observations	316	370	316	370	316	370	316	370	316	370	276	357
Sum	1503.5	2103.4	28404.2	31923.5	4626.5	6292.3	234.33	205.21	3424.4	4942.7	26384.6	32344.4
Mean	4.7579	5.6849	89.8867	86.2797	14.6408	17.0062	0.7416	0.5546	10.8367	13.3586	95.5964	90.6006
Std.Dev.	2.6539	2.8305	4.7882	3.9617	4.4157	4.2479	0.2832	0.2203	5.5073	3.7990	79.2539	47.3985
Variance	7.0434	8.0117	22.9268	15.6947	19.4982	18.0451	0.0802	0.0485	30.3305	14.4321	6281.1788	2246.6146
Range	17.1	17.3	33	22.6	27.5	26.4	1.52	1.35	43.5	20.3	922.4	256.3
Minimum	-3.3	0.3	74.5	73.4	5.6	4	0.12	0.19	-0.7	2.2	0.1	0.1
Maximum	13.8	17.6	107.5	96	33.1	30.4	1.64	1.54	42.8	22.5	922.5	256.4
Median	4.6	5.3	89.6	86.65	14.25	16.7	0.73	0.5	10.75	13.35	82.95	85.8
Kurtosis	0.8212	1.1027	0.5217	0.1883	1.5826	0.4535	0.0035	1.5972	2.5633	0.1657	42.3713	0.0684
Skewness	0.3924	0.8622	0.0712	-0.3095	0.8628	0.4279	0.3527	1.0663	0.6814	-0.2451	4.5675	0.4848
Std. Error	0.1493	0.1472	0.2694	0.2060	0.2484	0.2208	0.0159	0.0115	0.3098	0.1975	4.7705	2.5086
C. V.	0.5578	0.4979	0.0533	0.0459	0.3016	0.2498	0.3819	0.3972	0.5082	0.2844	0.8290	0.5232

Town and Village	Real Balance Ratio		Ordinary Balance Ratio		Debt Expenditure Burden Ratio		Financial Capacity Index		Real Debt Payment Ratio		Future Burden Ratio	
	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated	Non-Amalgamated	Amalgamated
Observations	785	156	785	156	785	156	785	156	781	156	562	133
Sum	5317.8	931.1	64428.9	13018.7	11638.1	3003.1	340.47	48.91	9632.3	2296.7	41257.8	11871.7
Mean	6.7743	5.9686	82.0750	83.4532	14.8256	19.2506	0.4337	0.3135	12.3333	14.7224	73.4125	89.2609
Std.Dev.	4.7609	3.7567	6.8064	4.4034	5.3254	5.2587	0.3195	0.1363	4.4010	3.6724	49.1692	45.3685
Variance	22.6659	14.1125	46.3275	19.3897	28.3599	27.6544	0.1021	0.0186	19.3690	13.4864	2417.6065	2058.3006
Range	44.6	18.7	64.6	27.9	34.7	28.4	2.5	0.92	29.3	23.6	323	214
Minimum	-9.6	0.6	38.9	65.4	0.1	5.6	0.05	0.12	-3.1	1.9	0.1	3.8
Maximum	35	19.3	103.5	93.3	34.8	34	2.55	1.04	26.2	25.5	323.1	217.8
Median	5.8	4.8	82.2	84	14.4	19.1	0.34	0.28	12.5	14.95	66.85	82.8
Kurtosis	6.0211	0.9352	2.2288	1.0240	0.6925	0.3067	3.7708	6.8696	0.4167	1.3782	2.0157	-0.2079
Skewness	1.8109	1.1001	-0.5010	-0.6108	0.4275	0.3447	1.6331	2.0707	-0.0977	-0.4494	1.0844	0.4489
Std. Error	0.1699	0.3008	0.2429	0.3526	0.1901	0.4210	0.0114	0.0109	0.1575	0.2940	2.0741	3.9339
C. V.	0.7028	0.6294	0.0829	0.0528	0.3592	0.2732	0.7367	0.4347	0.3568	0.2494	0.6698	0.5083

Source: Ministry of Internal Affairs and Communications (2012)

4. Result and Discussion

Table 5 shows tested results. In sum, tested results appears to be considered as follows; amalgamations have effective impacts on financial improvement of large cities,

there are not significant difference between the amalgamated middle cities and non-amalgamated middle cities, amalgamations have negative impacts of financial improvement of small cities, cities, and town and villages.

Table 5 Tested Results: Large City

	Non-Amalgamated	Amalgamated	Difference	
Sample	10	9		
Real Balance Ratio	0.570	2.467	1.897	**
	(0.422)	(2.179)	(1.757)	
Ordinary Balance Ratio	96.530	91.900	4.630	**
	(2.102)	(4.738)	(2.636)	
Debt Expenditure Burden Ratio	21.790	17.167	4.623	***
	(2.873)	(2.902)	(0.029)	
Financial Capability Index	0.887	0.852	0.035	
	(0.144)	(0.116)	(0.028)	
Real Debt Payment Ratio	13.710	10.678	3.032	
	(3.661)	(4.377)	(0.716)	
Future Burden Ratio	190.510	114.022	76.488	**
	(53.928)	(79.359)	(25.431)	

Middle City

	Non-Amalgamated	Amalgamated	Difference	
Sample	13	27		
Real Balance Ratio	3.308	3.441	0.133	
	(1.922)	(2.115)	(0.193)	
Ordinary Balance Ratio	90.954	88.867	2.087	
	(4.336)	(3.963)	(0.373)	
Debt Expenditure Burden Ratio	16.208	17.022	0.815	
	(4.351)	(4.290)	(0.061)	
Financial Capability Index	0.827	0.783	0.044	
	(0.142)	(0.220)	(0.078)	
Real Debt Payment Ratio	8.315	10.341	2.025	
	(3.741)	(3.936)	(0.195)	
Future Burden Ratio	96.655	101.008	4.353	
	(44.230)	(53.975)	(9.744)	

Small City

	Non-Amalgamated	Amalgamated	Difference	
Sample	20	21		
Real Balance Ratio	3.610	4.924	1.314	
	(2.543)	(2.882)	(0.339)	
Ordinary Balance Ratio	91.375	86.748	4.627	***
	(5.296)	(4.229)	(1.067)	
Debt Expenditure Burden Ratio	13.850	15.333	1.483	
	(3.372)	(2.342)	(1.030)	
Financial Capability Index	0.938	0.829	0.109	**
	(0.160)	(0.181)	(0.021)	
Real Debt Payment Ratio	6.960	11.505	4.545	***
	(3.936)	(3.208)	(0.728)	
Future Burden Ratio	69.876	93.724	23.847	*
	(36.707)	(35.767)	(0.940)	

City

	Non-Amalgamated	Amalgamated	Difference	
Sample	316	370		
Real Balance Ratio	4.758	5.685	0.927	***
	(2.658)	(2.834)	(0.176)	
Ordinary Balance Ratio	89.887	86.280	3.607	***
	(4.796)	(3.967)	(0.829)	
Debt Expenditure Burden Ratio	14.641	17.006	2.365	***
	(4.423)	(4.254)	(0.169)	
Financial Capability Index	0.742	0.555	0.187	***
	(0.284)	(0.221)	(0.063)	
Real Debt Payment Ratio	10.837	13.359	2.522	***
	(5.516)	(3.804)	(1.712)	
Future Burden Ratio	95.596	90.601	4.996	
	(79.398)	(47.465)	(31.933)	

Town and Village

	Non-Amalgamated	Amalgamated	Difference	
Sample	785	156		
Real Balance Ratio	6.774	5.969	0.806	**
	(4.764)	(3.769)	(0.995)	
Ordinary Balance Ratio	82.075	83.453	1.378	***
	(6.811)	(4.418)	(2.393)	
Debt Expenditure Burden Ratio	14.826	19.251	4.425	***
	(5.329)	(5.276)	(0.053)	
Financial Capability Index	0.434	0.314	0.120	***
	(0.320)	(0.137)	(0.183)	
Real Debt Payment Ratio	12.333	14.722	2.389	***
	(4.404)	(3.684)	(0.720)	
Future Burden Ratio	73.412	89.261	15.848	***
	(49.213)	(45.540)	(3.673)	

Note: Standard errors are in parentheses. *** presents a significant level at $p<0.01$, **

presents a significant level at $p<0.05$, and * presents a significant level at $p<0.1$.

The tested results of middle city may be impressive, because there are not significant differences for all financial indexes between the amalgamated municipalities and non-amalgamated municipalities. From these results, we can consider that the amalgamation policy does not have impact on financial improvements of middle cities.

As a whole, we can consider that a population size has a relationship with financial impacts of amalgamations. The results suggest that municipalities with large population achieve financial improvement through amalgamations, and municipalities with small population cannot achieve financial improvement through amalgamations.

Second suggestion is that only the municipalities whose fiscal soundness is weak amalgamated. However, in order to confirm this suggestion, we should test financial situation before the amalgamation policy.

Last, a service provision of municipalities may not have scale-economy. Municipalities provide services closely to daily life of residents. These services seem to have small scale economies, relative to services provided by the central and prefectural governments.

5. Conclusion

This paper studies a fiscal impact of this amalgamation policy on a fiscal soundness of municipalities. In order to achieve this purpose, this paper tests whether there are statistical differences in fiscal soundness between the amalgamated municipalities and non-amalgamated municipalities, using municipal's fiscal data.

Our results show that a fiscal soundness of non-amalgamated municipalities is

statistically better than that of amalgamated municipalities. This result has the following three suggestions. First, although succeeding in the reduction of the number of municipalities, the amalgamation policy did not achieve an improvement of fiscal soundness of municipalities. Second suggestion is that only the municipalities whose fiscal soundness is weak amalgamated. Last, a service provision of municipalities does not have scale-economy.

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Table 2 Brief summary of the policy of "Municipal Merger in Heisei Era"

	First Period: FY1999-FY2005	Second Period: FY2006-FY2010
Object	To realize 1,000 municipalities after amalgamations	
Method	Financial Incentive: special treatment on general subsidy from national government to amalgamated municipalities for 15 years, special treatment on municipal debts to finance the expenses due to amalgamation (compensations for principals and interests)	Financial Incentive: special treatment on general subsidy from national government to amalgamated municipalities for 10 years,
Changes in municipalities	Amalgamated municipalities: 1,991 Newly created municipalities from amalgamations: 581 Reduced municipalities by amalgamations: 1,410	Amalgamated municipalities: 151 Newly created municipalities from amalgamations: 59 Reduced municipalities by amalgamations: 92
Average population per municipalities	36,387 people in 1,999 to 68,947 people in 2010	
Average squares per municipalities	114.8 square km in 1999 to 215.0 square km in 2010	