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# **An Economic Analysis of Money Transfers -Social Security and Public Infrastructure in japan-**

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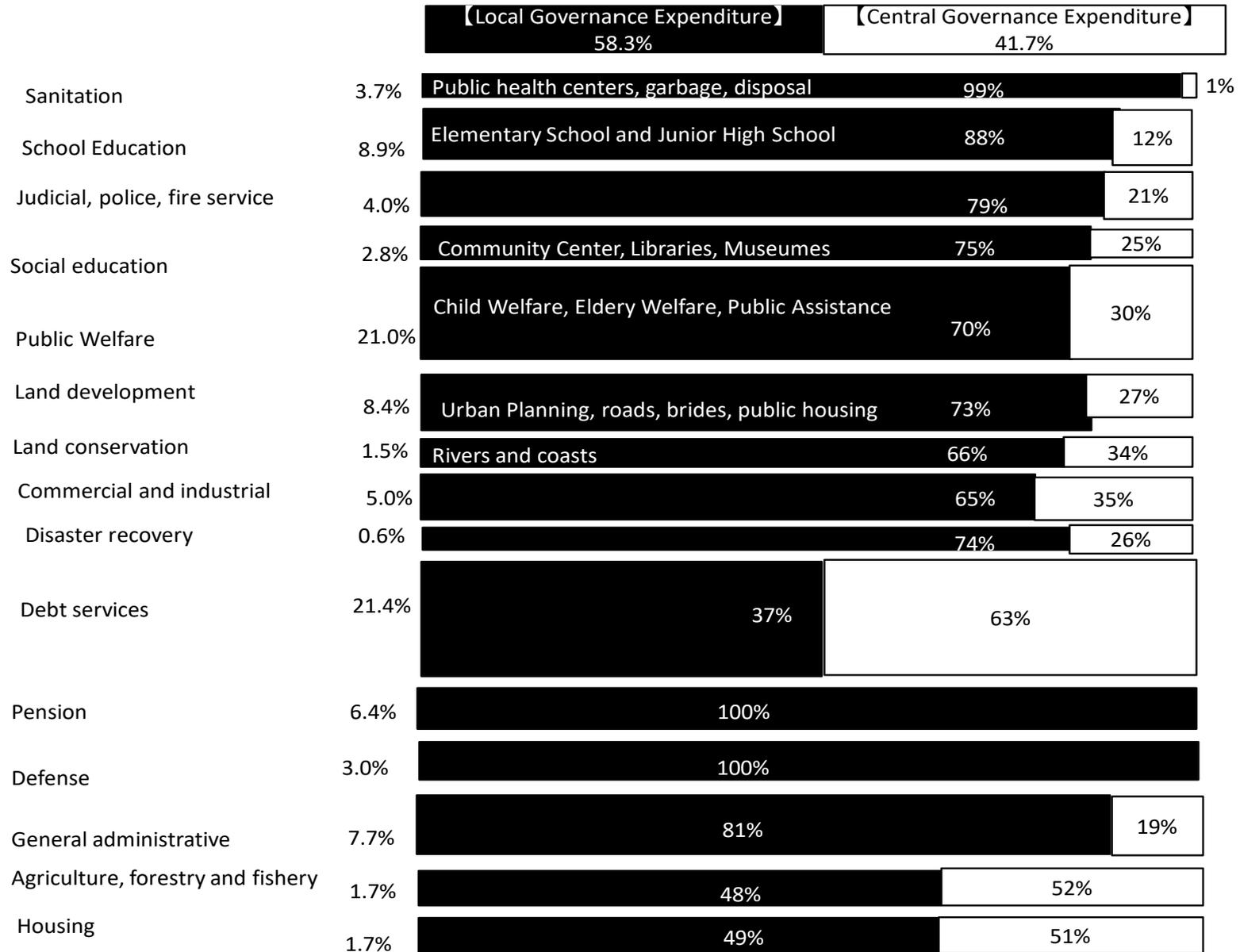
# Social Background of Local government

Municipalities constitute the basic level of government handling issues closet to the lives of residents.

**【For example】**

welfare, school education, fire defense, roads, rivers, and supporting nursing, medical and parental cares designed for a society.

# Share of Expenditures by Purpose of Central and Local Governments (final expenditure based)

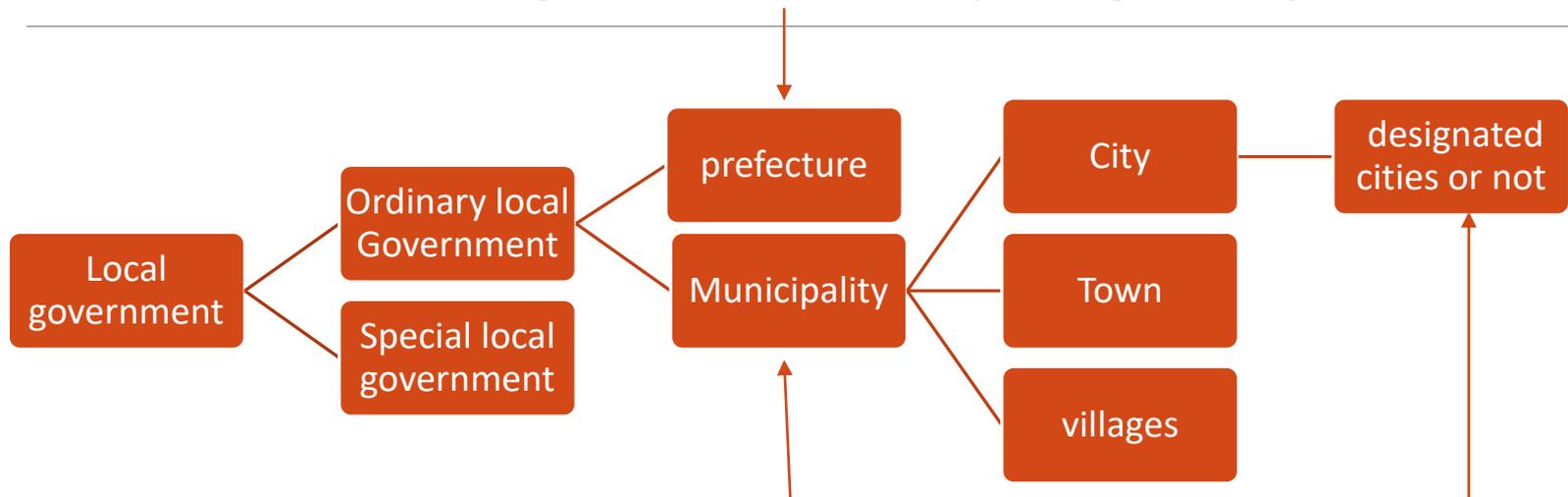


Source) Ministry of Internal Affairs and Communications "White Paper on Local Public Finance, 2016 "

# Local Government classification

wide-area local governments encompassing municipalities

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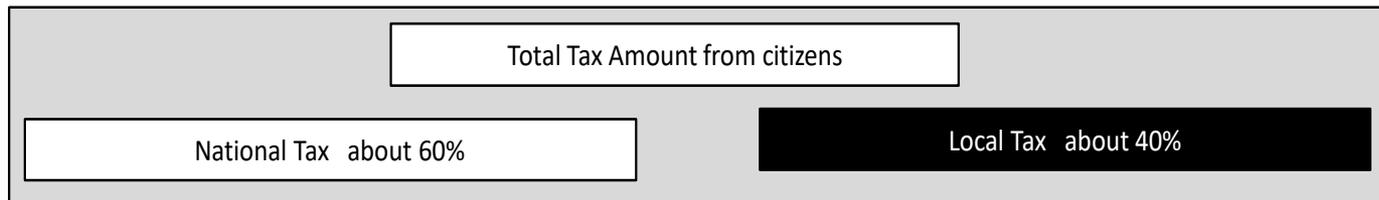


issues closet to the lives of residents.

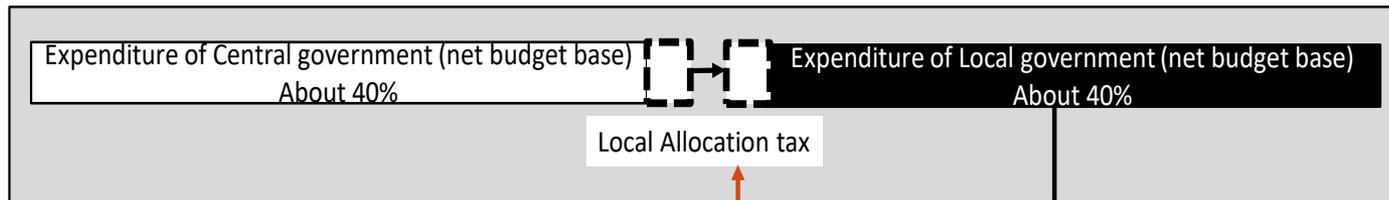
Designated cities have, through allocated duties, powers similar to those of prefectures in 17 areas such as social welfare, public health, and urban planning.

# Local governance finance

Ratio of Revenue  
Central:Local=3:2



Ratio of Expenditures  
Central:Local=2:3



Financial Support To the weaker financial capabilities.

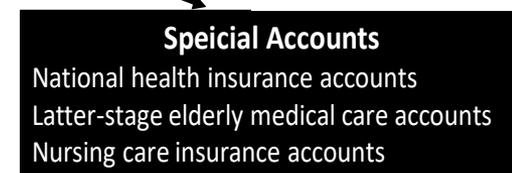


Public business account



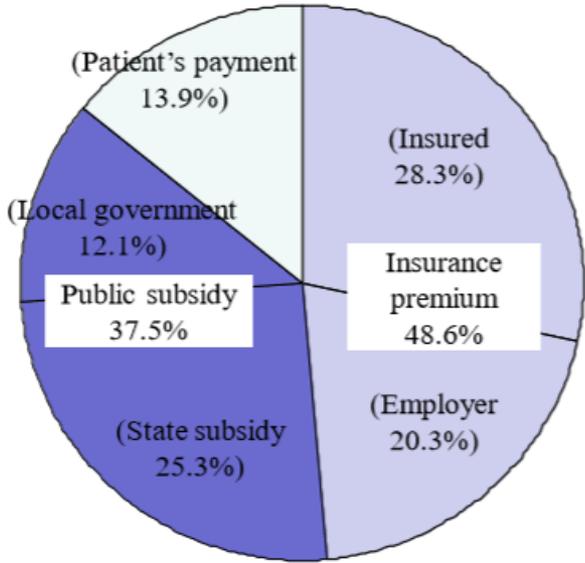
Transferred Money

Public business account



correcting the national / local imbalance  
between annual expenditures and  
allocated tax resources  
Compensating for the gaps in tax revenue  
among local governments

Proportion of the burden of national medical expenses in Japan (by resource) (FY2009)



Municipalities (Insurer)

	Municipalities	Prefectures	State
Tax	12.5%	12.5% (*)	25% (*)
Premiums	22%	28%	
		* As for benefits for facilities, the state bears 20% and prefectures bear 17.5%.	
		Determined based on the population ratio	

# National Health and Long-term Health Insurance expenditures

Source) Ministry of Health, Labour and Welfare "White Paper on Public Welfare Labor"

# Social Background of Local government

○An aging society, declining birthrate, and the decline in population  
→tax revenue decreasing and payments increasing

○the timeworn public infrastructure→ Increase in costs of maintenance and repair

○the drastic reduction of the local allocation tax

○the huge outstanding public debt and the continuation of the long-standing low interest rate policy



A lot of Shortfalls in local finances



Transferred Money increase from the general account to the special account  
and local public account



Financial aggravation of the general account

# Social Background

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○ Most social security costs have already been financed using deficit-covering governments bonds, passing the burden on to future generations.

→ A declining birth rate, a growing proportion of elderly people, and an overall decrease in the population

→ **A rapid increase in social security expenditure**

○ Promotion of earthquake resistance and measures against aging of water facilities

→ **Rapid increase in public infrastructure costs**

# Financial influence in social security

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Adoption of a social insurance system in which the relational benefits and burdens are clear.

However, social security benefits expenditure is covered not only by insurance premiums, **but the shortfall also by tax.**

=> Covering the shortfall in expenditure from special accounts with transfers from the general account of the local government.

=> Social security benefits and burdens will increase in the future based on the level of social security benefits and services.

# Financial influence on public infrastructure

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Through income from usage fees, the Local Public Enterprise is able to be a self-supporting accounting system; however, **funds from usage fees aren't equal to actual expenditure.**

=> Covering the shortfall in expenditure from special accounts with transfers from the general account of the local government

# Research Purpose

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In this study:

We investigate **whether money transferred from general accounts to special accounts has an impact** on the financial administration management of local public enterprises.

# Research Contents

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For example,

【Social Security Business】

National Health Insurance and Nursing Insurance  
Industries

【Public Infrastructure Business】

Water supply projects, lower water projects,  
transportation projects, hospital business projects

# Previous research1

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【Many overseas precedent studies 】

discussed securing necessary financial resources for fiscal management from public loan publication when a budget deficit occurs

(von Hagen(2006), von Hagen and Wolff(2006), Beetsma et al.(2007), Debrun et al.(2008), Beetsma et al.(2009), Debrun et al.(2009), Luechinger and Schaltegger(2013)).

→ **Not at the local government levels** such as the states, But the central government level including EU countries.

# Previous research2

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Doi and Bessyo (2005a, 2005b)

Local governments with a high allocation tax rate have higher rates, local bond issuances, and public works projects will increase.

Miyashita Sumi (2017)

Fiscal adjustment fund as future financial resources measures, as the allocation tax dependence rate is small, the real debt cost ratio is low, the 65-year-old population ratio is high and the population size is small I am doing.

# Previous research3

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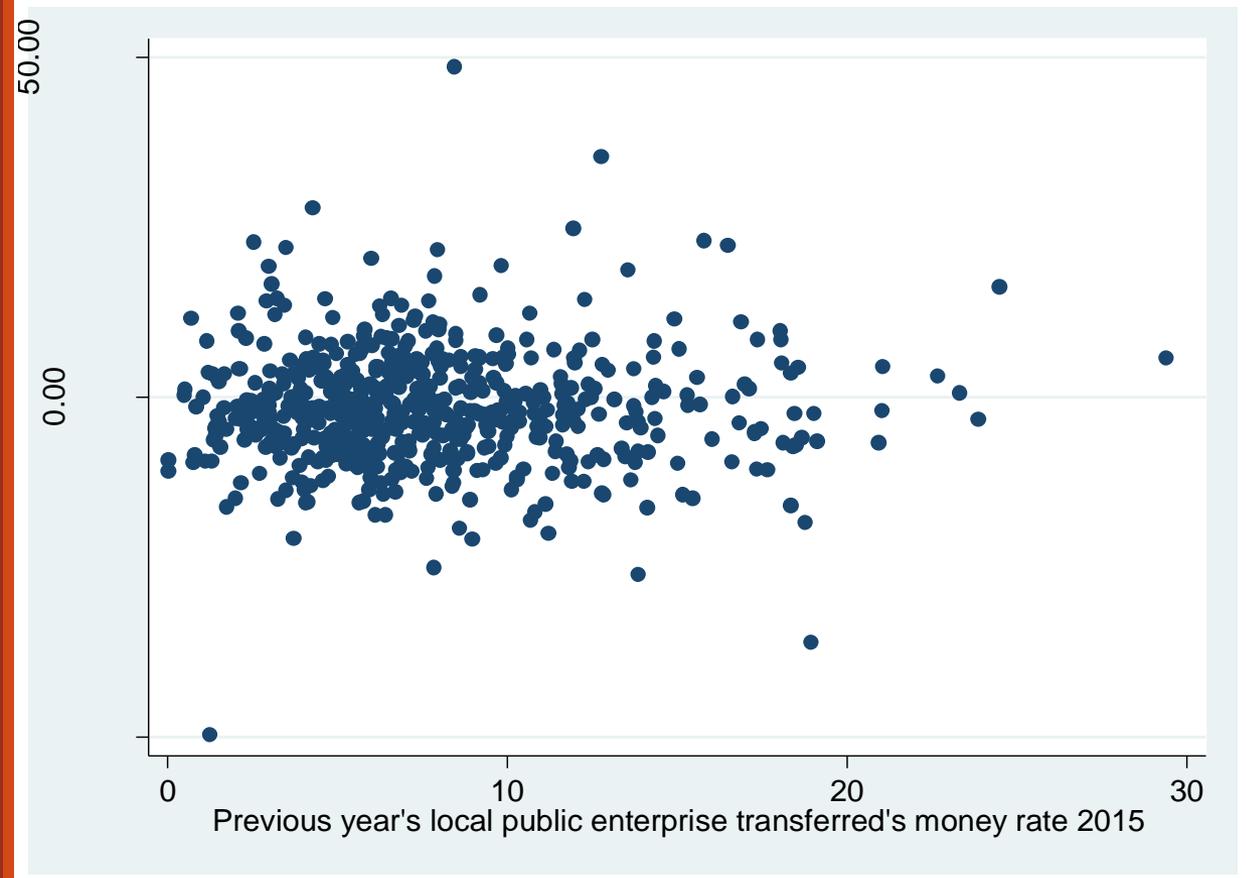
The general account of the local government and the real income and expenditure ratio was bad and the public loan publication rate is high if the dependence on local government rate of the subsidy from the central country is high.

→ The lack of resources of the local government may depend on the resources of other accounts other than the subsidies such as taxes allocated to local governments.

→ The precedent study that **took up the adjustment between accounts is rare.**

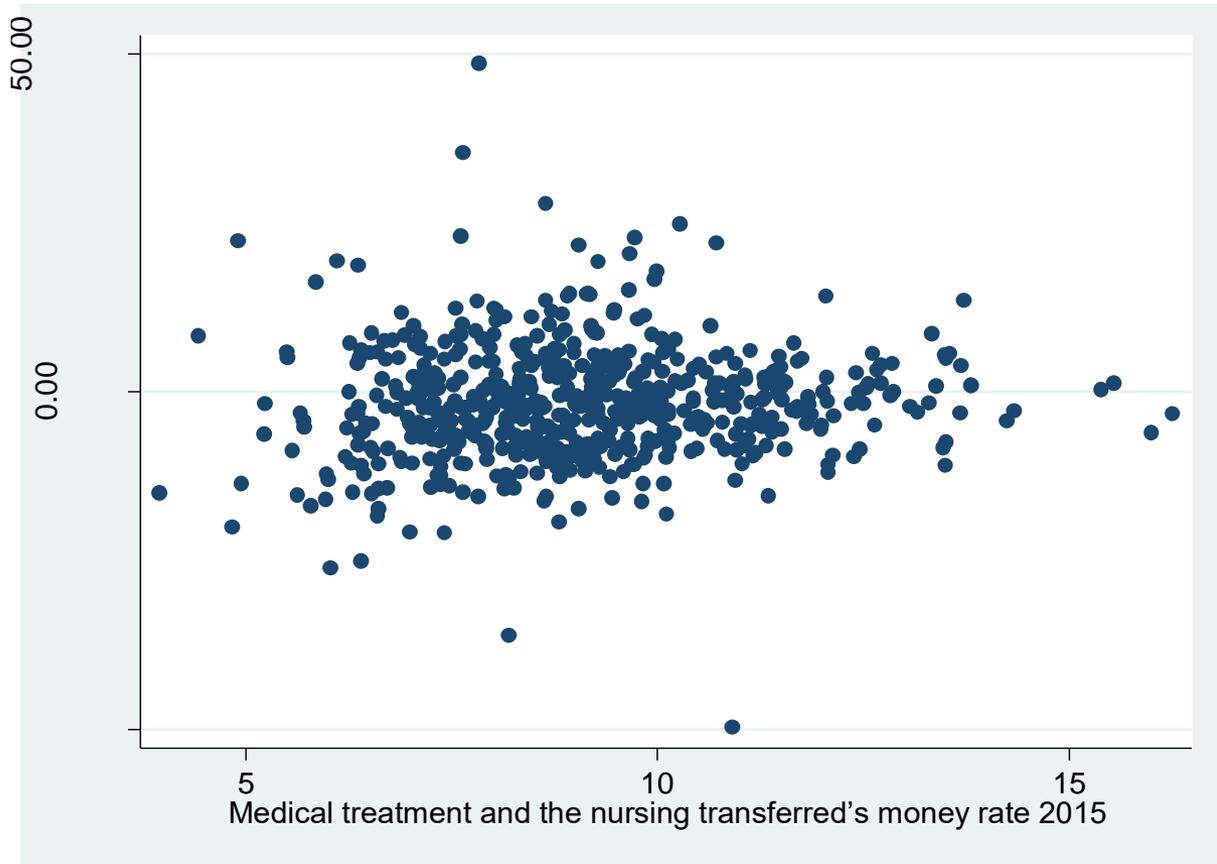
Net liability change rate and Local public enterprise transferred's money rate

【 Net liability change rate2016 and Local public enterprise transferred money rate2015 】



Net liability change rate and medical treatment and the Nursing transferred's money rate

【 Net liability change rate and Medical treatment and the nursing transferred money rate 】



# Hypothesis

If social security expenditure and public infrastructure expenditure are high, the money from the general account to special accounts will increase.

That will affect the financial management of the general account.

# Model

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○ Basic estimated model (basic presumption using the variable which shows a factor of financial operation)

$$y_{it} = \alpha + X\beta + \mu_{it} \quad (1)$$

$y_{it}$ : Variable vector of a variable and X: fiscal conditions of the reality of the local bond redemption and the reserved fund

○ Expansion estimated model (presumption of deficit cancellation)

$$y_{it} = \alpha + X\beta + \gamma Public_{it} + \pi Social_{it} + \mu_{it} \quad (2)$$

$Public_{it} Social_{it}$ : The variable which shows the degree of the deficit cancellation

# Data

○ *the Annual Statistics on Local Public Finance, Financial settlement of local public enterprises and other public businesses, Report on Internal Migration In Japan* provided by the Ministry of Internal Affairs and Communications (MIC)

○ Data (up to latest data after real enforcement April 1, 2009 of the Japan's Fiscal Consolidation at the April 1, 2009) according to cities, towns and villages from 2010 to 2016

○ With the exclusion of a special ward (Tokyo's 23 wards), the merger local governments after April 1, 2009, and the long-care insurer for partial cooperatives and wide-area cooperatives

Explained Variable

Net liability change rate

Net liability change rate =  
((Municipal bonds balance —  
Previous year's municipal bonds  
balance) — (Reserved fund balance —  
Previous year's reserved fund  
balance) ) / Standard financial scale  
× 100

## Main explanatory variable

Previous year's local public enterprise money rate

Previous year's medical treatment and the nursing transferred money rate

[Public infrastructure expenses index]

Previous year's local public enterprise transferred money rate from the general account =

(Previous year's water project transferred money + Previous year's transportation project transferred money + Previous year's hospital business transferred money + Previous year's water project transferred money) / the previous year's standard financial scale  $\times 100$

[Social security expenses index]

Previous year's medical treatment and nursing transferred money rate from the general account =

(Previous year's National Health Insurance business transferred money + Previous year's nursing insurance business transferred money) / Previous year's standard financial scale  $\times 100$

# Predictor variable and the definition

[Previous year's reserve fund balance ratio] =

Previous year's reserved fund amount / Previous year's standard financial scale  $\times 100$

[Previous year's municipal bond balance ratio] =

Previous year's municipal bond amount / Previous year's standard financial scale  $\times 100$

[Previous year's real loan costs ratio] =

Previous year's real loan expenditure / Previous year's standard financial scale  $\times 100$

[Financial index before the previous year's transfer] =

Standard fiscal revenue / (Previous year's standard financial expenditure + Previous year's payable amount of extraordinary financial special loan measure bond issue possible amount)  $\times 100$

# Predictor variable and the definition

[Previous year's corporate inhabitant tax ratio] =

Previous year's corporation profit tax of cities, towns and villages / Previous year's revenue  $\times$  100

[3-year average of previous year's disaster recovery ratio] =

(Previous year's disaster recovery expenditure + 2 periods prior, a disaster recovery expenditure + 3 periods prior, disaster recovery expenditure) / (the previous year's revenue + 2 periods prior revenue + 3 periods prior revenue)  $\times$  100.

[Previous year's less than 15 years old population rate] =

(Previous year's less than 15 years old population) / Previous year's population  $\times$  100

[Previous year's more than 65 years old population rate] =

(Previous year's more than 65 years old population) / Previous year's population  $\times$  100

## Meaning

### 【Previous year's reserve fund balance ratio】

Index indicating the fiscal surplus for the future based on the previous year

### 【Previous year's municipal bond balance ratio】

Index indicating the amount of principal and the interest repayment borrowed from financial institutions to maintain public accommodation and water services, the sewers, and the roads

## Relationship with explanatory variable

○If the financial situation is favorable

【Previous year's reserve fund balance ratio】 is high

【Previous year's municipal bond balance ratio】 is low →

High fiscal surplus → reducing an action to fiscal consolidation → Decrease in net liability change rate

○If the fiscal situation is adverse

【Previous year's reserve fund balance ratio】 is low

【Previous year's municipal bond balance ratio】 is high →

Low fiscal surplus → promoting an action to fiscal consolidation → Rise in net liability change rate

【Previous year's  
reserve fund balance  
ratio】

【Previous year's  
municipal bond  
balance ratio】

# 【Previous year's real loan costs ratio】

## Meaning

Index indicated by Japan's Fiscal Consolidation

For example

Money from the principal and the interest repayment from the general account

Money associated with the principal and the interest repayment for assignment to public loan costs

Transferred money from other accounts

## Relationship with explanatory variable

○If the financial situation is favorable

【Previous year's real loan costs ratio】 is low → High fiscal surplus → reducing an action to fiscal consolidation → Decrease in net liability change rate

○If the fiscal situation is severe

【Previous year's real loan costs ratio】 is high → Low fiscal surplus → promoting an action to fiscal consolidation → Rise in net liability change rate

# 【 Financial index before the previous year's transfer】

## **Meaning**

Index indicating the financial power of each local government

## **Relationship with explanatory variable**

○ If the fiscal situation is favourable

【Financial index before the previous year's transfer】 high

⇒ The reservation resources are large (Correspondence to unexpected annual expenditure is possible)

⇒ reducing an action to fiscal consolidation

→ Decrease in net liability change rate

○ If the fiscal situation is adverse

【Financial index before the previous year's transfer】 low

⇒ Reservation resources are small (Correspondence to unexpected annual expenditure is impossible)

⇒ promoting an action to fiscal consolidation

→ Rise in net liability change rate

# 【Previous year's corporate inhabitant tax ratio】

## Meaning

Index indicating the economic margin of local governments

Tax ratio that corporations pay to each local government depending on company profit and corporate scale

As long as conservative fiscal management is carried out in consideration of the instability of tax revenue, the reserve in the fund will increase

## Relationship with explanatory variable

【Previous year's corporate inhabitant tax ratio】 is high → High fiscal surplus → reducing an action to fiscal consolidation → Decrease in net liability change rate

【Previous year's corporate inhabitant tax ratio】 is low → Low fiscal surplus → promoting an action to fiscal consolidation → Rise in net liability change rate

【 3-year average  
of previous  
year's disaster  
recovery ratio 】

## Meaning

Substitution variable for the possibility to cause a disaster in each local government (frequency of suffering)

If the disaster recovery rate is high, there is a possibility that it is easy to accumulate fiscal adjustment funds.

## Relationship with explanatory variable

【 3-year average of the previous year's disaster recovery ratio 】 is high → Expenditure to an unexpected misfortune is big → promoting an action to fiscal consolidation → Rise in net liability change rate

【 3-year average of the previous year's disaster recovery ratio 】 is low → Expenditure to an unexpected misfortune is small → retaining an action to fiscal consolidation → Decrease in net liability change rate

【 Population rate of those younger than 15 years in the previous year】

【 Previous year's population rate of those over 65 years】

## Meaning

【Fiscal power index before transfer in a single year】 is related to population size, standards for each item of expenditure basis Calculation of unit demand for population adoption → Population growth rate (static expectation) is a proxy variable for future population . Indicator of expenditure change

## Relationship with explanatory variable

○ In the case that finance has room

【Population change rate for those under 15 years】 Increase  
→ Increase in expenditure → High margin of cash in hand  
→ No response to sound improvement → Decline in the rate of change in net debt

【Population change rate for those over 65 years】 Increase  
→ Increase in expenditure → High margin of cash in hand  
→ Response can be taken for soundness → Reduction in the rate of change in net debt

【 Population rate of those younger than 15 years in the previous year】

【 Previous year's population rate of those over 65 years】

○ When the fiscal situation is severe

【Previous year's population of those younger than 15 years】 Increase → Increase in expenditure → Strict cash in hand → Response to soundness → Reduction in the rate of change in net debt

【 Previous year's more than 65 years old population rate】 Increase → Increase expenditure → Strict cash in hand → Respond to soundness → Reduce the rate of change in net debt

○ When finances are more severe

【Previous year's population of those younger than 15 years】 Increase → Increase expenditure → Strict cash in hand → difficult to achieve soundness → Increase in net debt change rate

【 Previous year's population of those over 65 years】 Increase → Increase expenditure → Strict cash in hand → difficult to achieve soundness → Increase in net debt change rate

	Observation Number	Mean	Standard deviation	Min	Max
Net liability change rate	10,200	-3.989	-154.240	-9558.999	9413.088
Previous year's local public enterprise transferred's money rate	10,200	7.652	8.228	0.000	528.040
Previous year's medical treatment and the nursing transferred money rate	10,200	7.423	2.484	0.295	69.003
Previous year's reserve fund balance ratio	10,200	61.220	59.708	0.216	2091.270
Previous year's municipal bond balance ratio	10,200	167.893	142.082	0.030	11089.360
Previous year's real loan costs ratio	10,200	10.262	4.981	-6.600	76.800
Financial index before the previous year's transfer	10,200	46.277	26.953	4.112	233.919
3 Year Average previous year's disaster recovery ratio	10,200	2.665	6.820	0.000	98.902
Previous year's corporate inhabitant tax ratio	10,200	1.919	2.092	0.029	48.697
Previous year' less than 15 years old population rate	10,200	12.225	2.396	2.754	22.015
Previous year's more than 65 years old population rate	10,200	29.165	7.037	10.909	60.019

# Description statistics

# Estimation result

	Model1	Model2	Model3
Net liability change rate			
Previous year's local public enterprise's transferred's money rate	3.500*	0.185**	1.563**
	(1.824)	(0.0735)	(0.664)
Previous year's medical treatment and the nursing transferred's money rate	0.270	-0.124	1.106
	(4.467)	(0.164)	(1.131)
Previous year's reserve fund balance ratio	0.0167	0.00361	0.645***
	(0.227)	(0.00748)	(0.0810)
Previous year's municipal bond balance ratio	-0.204	0.0365***	-1.147***
	(0.194)	(0.00863)	(0.0350)
Previous year's real loan costs ratio	4.173	-0.684***	0.579
	(2.574)	(0.101)	(0.910)
Financial index before the previous year's transfer	0.539	-0.0364	0.152
	(0.559)	(0.0223)	(0.443)
3 Year Average previous year's disaster recovery ratio	0.964	0.0854*	0.200
	(3.470)	(0.0476)	(0.294)
Previous year's corporate inhabitant tax ratio	-1.177	0.0615	-3.905***
	(9.651)	(0.168)	(1.491)
Previous year' less than 15 years old population rate	-3.596	0.263	11.65**
	(7.347)	(0.296)	(4.730)
Previous year's more than 65 years old population rate	-1.888	-0.141	7.990***
	(3.045)	(0.128)	(2.471)
2011.year			-19.03***
			(5.422)
2012.year			-22.59***
			(5.637)
2013.year			-27.64***
			(6.557)
2014.year			-30.81***
			(7.856)
2015.year			-33.83***
			(9.106)
2016.year			-43.06***
			(11.09)
Constant	25.60	0.530	-223.9**
	(186.6)	(7.826)	(111.9)
Observations	1,275	1,275	8,925
Adj-R-squared	0.010	0.049	0.580
Hausman Test			chi2(10) =1883.17***
Number of code			1,275

# Estimation result

	all municipalities Model4	government ordinance Model5	except of government ordinance Model6	town Model7
Net liability change rate				
Previous year's local public enterprise's transferred's money rate	1.563** (0.664)	14.32** (5.465)	4.254*** (1.375)	0.0130 (0.0997)
Previous year's medical treatment and the nursing transferred's money rate	1.106 (1.131)	66.50*** (11.82)	1.888 (3.586)	-0.185 (0.128)
Previous year's reserve fund balance ratio	0.645*** (0.0810)	-0.642 (2.424)	0.836*** (0.148)	0.276*** (0.0145)
Previous year's municipal bond balance ratio	-1.147*** (0.0350)	-1.624*** (0.305)	-1.323*** (0.0681)	-0.122*** (0.0127)
Previous year's real loan costs ratio	0.579 (0.910)	11.27 (6.800)	-0.350 (2.043)	-0.442*** (0.127)
Financial index before the previous year's transfer	0.152 (0.443)	-18.39*** (4.823)	1.079 (1.193)	0.159*** (0.0554)
3 Year Average previous year's disaster recovery ratio	0.200 (0.294)	-1.907 (2.704)	0.569 (1.044)	0.0427 (0.0328)
Previous year's corporate inhabitant tax ratio	-3.905*** (1.491)	-44.47* (25.45)	-8.390** (3.762)	0.0458 (0.184)
Previous year' less than 15 years old population rate	11.65** (4.730)	48.56 (113.7)	32.67** (15.39)	1.731*** (0.538)
Previous year's more than 65 years old population rate	7.990*** (2.471)	24.08 (17.79)	14.70** (7.208)	-0.0790 (0.299)
2011.year	-19.03*** (5.422)	-99.76** (41.11)	-25.25* (13.38)	-0.715 (0.715)
2012.year	-22.59*** (5.637)	-111.0*** (40.55)	-32.75** (13.79)	-0.364 (0.752)
2013.year	-27.64*** (6.557)	-73.03 (46.38)	-37.82** (16.57)	-0.944 (0.870)
2014.year	-30.81*** (7.856)	-78.13 (48.84)	-46.27** (20.90)	3.821*** (1.024)
2015.year	-33.83*** (9.106)	-58.70 (51.89)	-50.80** (25.28)	0.0666 (1.162)
2016.year	-43.06*** (11.09)	-82.73* (49.71)	-68.24** (31.71)	1.397 (1.395)
Constant	-223.9** (111.9)	93.18 (1.929)	-663.1** (330.4)	-25.46* (13.96)
Observations	8,925	126	4,137	4,662
Adj-R-squared	0.580	0.780	0.591	0.238
Hausman Test	chi2(10) =1883.17***	chi2(10) =73.32***	chi2(10) =790.09***	chi2(10) =581.06***
Number of code	1,275	18	591	666

# Conclusion

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The burden of a local public enterprise's transferred money contribution from the previous year can inflate an annual net liabilities frame concerned with the financial operation of all cities and towns.

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Medical treatment of the previous year and the burden of a nursing insurance business's transferred money contribution inflate an annual net liabilities frame concerned with the financial operation of the entire city besides ordinance-designated cities.

**It is clear that the transferred money from the special account and other account make the general account financial get worse**

# Discussion

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To improve such a situation, it is necessary to build the fiscal consolidation,

○ a sustainable social security system, tax system reform,

○ "who and how to efficiently provide" the necessary infrastructures for local community lives.



achieving a surplus in the primary balance of the central and local governments.

Thank you