

Geographic Income Distribution and the LDP

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Abstract

Did the structural reforms under the Koizumi Administration worsen the regional income disparity and bring about economic stagnation in rural areas? If so, was the widening of the regional inequality a crucial factor that toppled the LDP out of power? Using municipal-level income data from 1973 to 2008, I provide descriptive information to evaluate these key questions linking structural reforms and the subsequent electoral performance of the party in power.

The empirical analyses reveal four main findings: (1) income inequality across regions increased since around 2000. (2) The growing income disparity in the last decade coincided with the stagnation of the rural areas. Small-sized municipalities had lower growth rates than larger ones. (3) Though not conclusive, there are pieces of information suggesting that the stagnation of the rural areas is due in part to the cutback of transfers from the national to local governments. (4) Finally, the LDP-led coalition's vote shares in small-sized municipalities decreased in the 2005 and 2009 Lower House elections. The decrease in the per capita income was associated with the decrease in the ruling coalition's vote shares.

Key words: Income, Geographic, LDP, Election, Japan

1. Introduction

The goal of this paper is to evaluate a conventional argument linking structural reforms, economic stagnation in rural areas, and the LDP's defeat in 2009. It is often argued that the structural reforms under the Koizumi Administration exacerbated the income inequality among localities, and the widening inequality in turn was one of the main causes of the LDP's consecutive defeats in the 2007 Upper House election and the 2009 Lower House election. This is oftentimes assumed to be valid without rigorous empirical scrutiny. However, there are at least several steps that need to be verified to have a confidence in the above argument. First, the income disparity across localities indeed increased after Koizumi took power. Second, if so, the rise in regional income inequality was driven by zero or negative income growth in rural areas. Inequality can increase even when less wealthy regions, which happen to be rural areas in contemporary Japan, have positive growth if the rate at which the wealthy localities become richer exceeds that of the less wealthy. Third, if these two points were true, one should verify it was the structural reforms that brought about such trends. It is possible that the policies had

nothing to do with the trend of inequality. Fourth, the LDP-led coalition's vote shares decreased in localities that became less wealthy, and the decrease in vote shares was large enough for the LDP to lose a majority in the Upper and the Lower Houses.

It is beyond the scope of this paper to provide a comprehensive answer to each of the aforementioned steps. Instead, I focus on the task of accumulating descriptive information to help assess the above conventional argument that connects the structural reforms, growing regional inequality and the political backlash against the LDP. In this paper, I use municipal-level income, budget and electoral data and present four main findings. (1) Income inequality across regions increased since around 2000. (2) The growing income disparity in the last decade coincided with the stagnation of rural areas. Small-sized municipalities indeed had lower growth rates than larger ones. (3) There is some evidence suggesting that the stagnation of the rural areas was due in part to the cutback of transfers from the national to local governments. (4) The LDP-led coalition's vote shares in small-sized municipalities decreased in the 2005 and 2009 Lower House elections in comparison with the previous elections. Furthermore, the decrease in the per capita municipal income was associated with the decrease in the ruling coalition's vote shares in municipality.

The rest of the paper is organized as follows. Section 2 presents the historical trend of the income disparity among localities. Section 3 examines links between fiscal policies and the rising regional income inequality. Section 4 assesses political consequences of the income inequality among localities. Section 5 provides discussion and conclusion.

2. Koizumi's Structural Reform and the Growing Regional Inequality

In this section, I use municipal-level income data and demonstrate the following two points. First, the historical trend is such that the inequality across regions indeed increased while Koizumi was in power. The regional income disparity widened in the 2000s although the 1980s also witnessed a similar trend. Second, the rise in inequality in the 2000s was driven partly by the economic stagnation in rural areas, while it was not in the 1980s. In the former case (2000s), rural areas had negative and lower growth rates than urban areas, whereas the growth rate was positive in the latter (1980s).

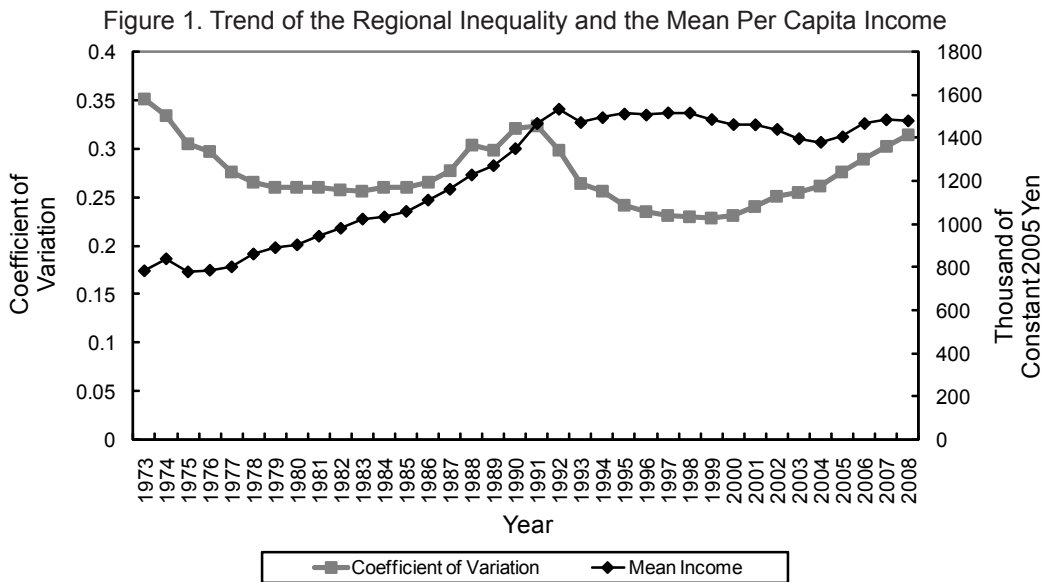
2.1 Trend of Inequality among Municipalities

The key variable employed in this analysis is taxable per capita income at municipal level (JSP, various issues; Nippon Marketing Kyōiku Center, various issues; Shichōson Zeimu Kenkyūkai, various issues). The period covered by the dataset is 1973-2008. 1973 is the earliest year from which the municipal-level income data is available, whereas 2008 is the most up-to-date information. All the income data are expressed in 2005 yen using Consumer Price Index,

which is based on the Retail Price Survey conducted by the Statistics Bureau of the Ministry of Internal Affairs and Communications (Statistics Bureau 2010). For each year, I calculate the coefficient of variation weighted by the municipal population in the year to gauge the degree of regional income inequality. Using other measures such as Gini coefficient and Theil Index does not change the substantive findings of this paper.

Note that municipal boundaries are not consistent across years due to the wave of municipal mergers, most of which took place between Fiscal Years 2003 and 2005. Thus, for each year, boundaries are adjusted so that they are identical across time. In particular, municipal boundaries in the dataset are as of August 30, 2009. The date is selected to incorporate the outcome of the 2009 election into the analyses (presented in Section 4). Boundaries are adjusted in the following manner. First, for each municipality and year, I identify which municipality it belongs to in 2009. Second, I group the observations which belong to the same municipality as of 2009. Third, for each municipality in the 2009 boundary, I calculate the weighted mean of the variables of interest. For each year, the weight is the municipal population in the year. Thus, for each year, the number of observations is 1798.

Figure 1 shows the trend of the coefficient of variation and the national mean of the per capita income from 1973 to 2008. A higher value of the coefficient of variation indicates the higher degree of inequality across observations. As Figure 1 shows, the inequality was relatively high in the 1970s, decreased throughout the decade and remained relatively low until the late 1980s. It rose around the time of the asset price bubble in the late 1980s and the early 1990s. As the country went through the decade of economic slump, the inequality across



Note: Constructed from the municipal-level income data. Mean income refers to the national mean of the taxable income, which is obtained by dividing the total taxable income by the total population in the country. Constant 2005 yen is used to account for inflation in calculating the national mean income.

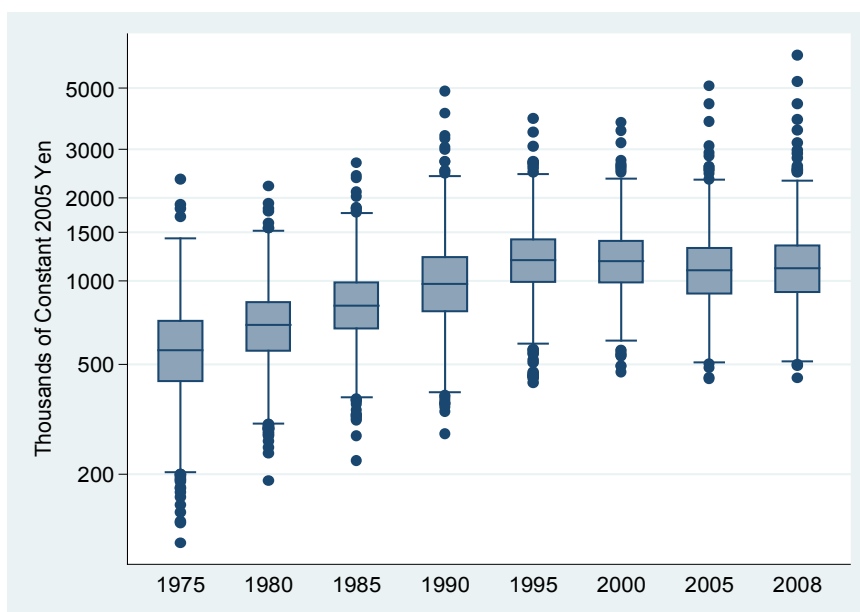
regions shrank and remained low, before rising again in the 2000s. Thus, as the conventional argument holds, the regional inequality increased under the Koizumi Administration, although both the increase in inequality (1980s) and the current level of inequality (1970s, late 1980s) have existed in the past.

2.2 Income Distribution and Income Inequality

The next step is to evaluate whether the recent increase in inequality was driven by the stagnation in rural areas. The coefficient of variation can increase even if the per capita income of the rural areas rises if, for example, big cities have even more rapid income growth. As Figure 1 indicates, the increase in regional inequality in the late 1980s was accompanied by the increase in the national mean income whereas that in the 2000s was not. The mean income continued to fall since 1998 before reversing the trend in 2005.

Figure 2 shows the box plots of the income distributions for selected years between 1975 and 2008. As we saw in Figure 1, the inequality across localities increased both in the 1980s and the 2000s. Figure 2 suggests that in both periods the widening inequality was at least partially due to the small number of municipalities which had very high incomes. However, the 25th, the median and the 75th percentile incomes in 1990 were higher than those in 1980 or 1985. On the other hand, the widening of the income disparity in the 2000s was not accompanied

Figure 2. Box Plot of the Municipal Per Capita Income, Selected Years



Note: Constructed from the municipal-level income data. The figure shows the box plots of the income distributions for 1975, 1980, 1985, 1990, 1995, 2000, 2005, and 2008. The per capita income is expressed in log. The Y-axis label shows the actual income (thousand), instead of the values in log. Constant 2005 yen is used to account for inflation.

by such patterns, as the comparison of the 2000, 2005 and 2008 data indicates. For example, the 25th, the median and the 75th percentile incomes in 2005 are lower than those in 2000. This difference seems substantively important because political consequences of inequality may vary considerably depending on whether or not the wellbeing of the lower part of the income distribution is improving.

2.3. Income Growth and Urban-Rural Disparity

To further evaluate whether rural areas stagnated after Koizumi assumed office, this subsection employs municipal-level analyses and examines where the per capita income grew and where it dropped in the period covered by the dataset. If the structural reforms led to the stagnation of rural areas, the growth rate of the per capita income there should be non-positive and lower than that in urban areas. Although the existence of such an empirical regularity does not necessarily mean the structural reforms caused the incomes in rural areas to drop, it seems crucial to provide its empirical verification using detailed data.

Figure 3 shows the relationship between municipal population, used as a proxy for

Figure 3. Municipal Population and Income Growth



Note: The unit of observations is municipalities. The number of observations is 1798 for all panels in the figure. The boundaries are as of August 30, 2009. Constant 2005 yen is used to calculate the growth rate of per capita income. X-axis is the municipal population (log). The X-axis label shows the actual population (thousand), instead of the values in log. Y-axis is the growth rates of the per capita income (%). The dashed line shows $y = 0$. Observations below this line indicate municipalities whose per capita incomes decreased during the period. The solid lines are the linear lines based on the regressions of the income growth on the municipal population.

urbanness, and the growth rate of the per capita income for the entire period (1973-2008) and the following sub-periods: 1973-1980, 1980-1990, 1990-2000, and 2000-2008.

Figure 3 reveals two relevant findings. First, the growth in the per capita income was indeed negative between 2000 and 2008 in the majority of municipalities. Second, the growth rates of smaller municipalities were lower than those of larger ones. This marks a stark contrast with the preceding periods. The income growth rates were positive for most municipalities in the 1973-1980 and the 1980-1990 periods. Although the growth slowed down in the 1990s and some municipalities experienced negative growth, smaller municipalities in fact had higher growth rate than their urban and larger counterparts, which was opposite from the pattern in the 2000s.

Note also that the income growth was higher for smaller and initially less wealthy municipalities during the period from 1973 to 2008 (Figure 4). Likewise, the variance in the initial income (horizontal axis) is smaller in the more recent periods. This is consistent with the theoretical proposition and empirical findings that in the long-run poorer localities/regions/countries have higher growth rates and incomes tend to converge (E.g. Barro and Sala-i-Martin 1992; Barro, Sala-i-Martin, Blanchard and Hall 1991; Sachs and Warner 1995). Smaller municipalities had much lower incomes in the beginning of the sample period and, over the 36-year span, grew faster than the richer counterparts.

Figure 4. Initial Income and Subsequent Growth



Note: The unit of observations is municipalities. X-axis is the initial level of the per capita income (log). The X-axis label shows the actual initial per capita income (thousand), instead of the values in log. Y-axis is the growth rates of the per capita income (%). The boundaries are as of August 30, 2009. Constant 2005 yen is used to calculate the growth rate of the per capita income. The dashed line shows $y = 0$. The solid lines are the linear lines based on the regressions of the income growth on the initial income.

In sum, it appears that the regional income inequality indeed increased after Koizumi assumed power in 2001. And the increase in inequality coincided with the stagnation of the rural areas, the pattern unseen in the previous periods.

3. Fiscal Policy and Regional Inequality

This section evaluates how fiscal policies were related to the rise and fall in income inequality across municipalities. It shows that the rise in inequality in the 2000s coincided with the decrease in the intergovernmental transfers to municipal governments. In addition, the change in the municipal expenditure for the ordinary construction projects was positively associated with income growth.

The fact that the inequality across regions increased under the Koizumi Administration does not necessarily mean his structural reforms caused the widening of the disparity between rural and urban areas. In a counterfactual scenario in which such policies were not implemented, it is possible that the inequality still increased at the same or even higher rates. Also, various other factors are hypothesized to affect inequality across localities. For example, exogenous shocks that negatively affect the economy could worsen the regional income disparity if their effects are unevenly distributed across localities. The unevenness could arise, for example, due to the differences in their industrial structures. Similarly, income tends to be lower for the elderly. However, the pace of aging is not likely uniform across municipalities. The rate at which the elderly population increases is faster for some municipalities than others, leading to lower growth of the per capita income in such places and possibly widening the overall regional inequality.¹⁾

It is beyond the scope of this paper to build models of regional inequality, identify factors that have causal impacts on the growing income disparity among localities, and obtain precise estimates of their effects on the trend of inequality in the last decade. Instead, I focus on one of the key components of the structural reforms, namely the “trinity reform”. This piece of reform is important because the fiscal transfers from the national government seem to play crucial roles in local economies, especially in places that are rural and lack solid tax bases and prominent industries (E.g. Scheiner 2006). By providing descriptive information that connects the structural reforms and the growing regional inequality, I hope to enhance further theoretical and empirical evaluations in future works.

1) Municipal-level data shows that the increase in the percentage of the elderly (those who are 65 years old or older) is negatively associated with the growth rate of the municipal per capita income, if one compares 2000 and 2005. However the relationship is *positive* in the 1990s, which is opposite to our expectation.

3.1. Trend of Intergovernmental Transfers

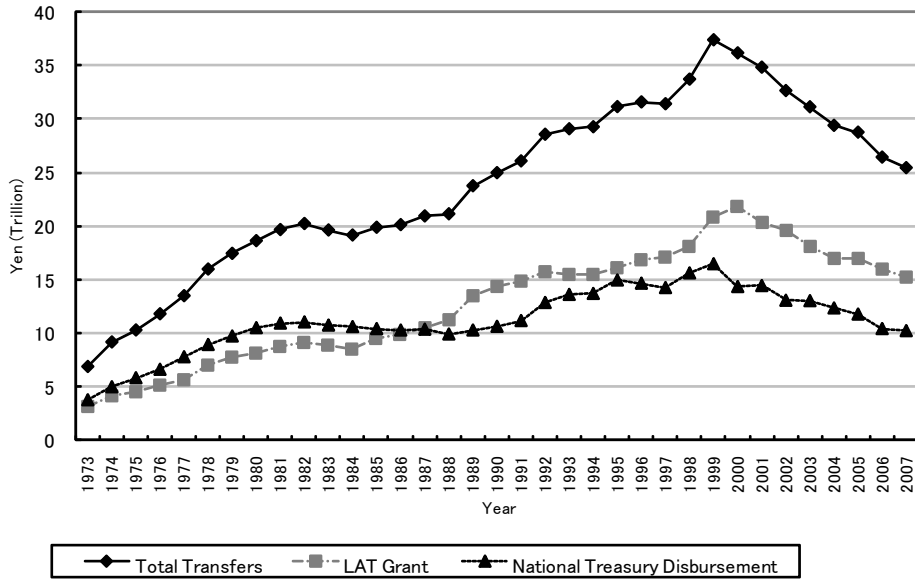
Koizumi Junichiro assumed the prime ministership in 2001. He proclaimed his intention to initiate structural reforms, stating in his policy speech that “without structural reforms there can be no economic recovery” (Koizumi 2001). As Koizumi made explicit in various occasions, fiscal reconstruction and decentralization were integral parts of the agenda of the reforms. One way in which the plan materialized was the “trinity reform” (*sanmi ittai no kaikaku*). It was a comprehensive attempt to modify three components of the intergovernmental fiscal relation: the local allocation tax (LAT) grant (*chiho kofuzei kofukin*), the national treasury disbursement (*kokko shishtsukin*), and the local taxes. In short, the reform aimed at transferring the taxation authority to local governments, while reducing intergovernmental transfers from the national government (Doi 2004; Mochida 2008).

Figure 5 presents the long-run trends of the aggregate amounts of the LAT grant, the national treasury disbursement and the total intergovernmental transfers (LAT grant + the national treasury disbursement). As the figure shows, both the LAT grant and the national treasury disbursement declined constantly after they reached their peaks in the late 1990s. Furthermore, it was not the case that the reduction in the aggregate amount was driven only by the cutbacks of transfers to urban areas. Figure 6 shows the relationship between the municipal population size and the change in the total intergovernmental transfers to municipality. The relationship is slightly positive, which means that the reduction was rather larger in rural areas. In fact, some argue that the sharp cutbacks of transfers in the early 2000s significantly increased the costs of remaining autonomous, made it impossible for miniscule municipalities to exist on their own, and induced them to undergo mergers with their neighbors (E.g., Horiuchi, Saito and Yamada 2009; Shigemori, Sekino and Kawase 2002)

3.2. Reduction in Subsidies and the Rural-Urban Disparity

As mentioned above, the reduction in the transfers may have detrimental effects on municipalities in rural areas and their economies. First, municipal governments in rural areas tend to have weak tax bases and therefore heavily rely on the transfers from the national government. As presented in Figure 7, in many of the smaller municipalities, the intergovernmental transfers account for more than 50% of their revenues, based on the data in Fiscal Year 2000. The sudden cutback of the transfers almost automatically reduces municipal revenues, which are closely tied to their expenditures. Assuming the expenditures by municipal governments affect incomes of the residents in nontrivial ways, the cutback of transfers from the national government is likely to have negative effects on the per capita income. Second, the intergovernmental transfers are nontrivial sources of public works, and for rural municipalities, they are important sources of employment and economic activities. As an indirect measure of the role of public works, Figure 8 presents the relationship between the

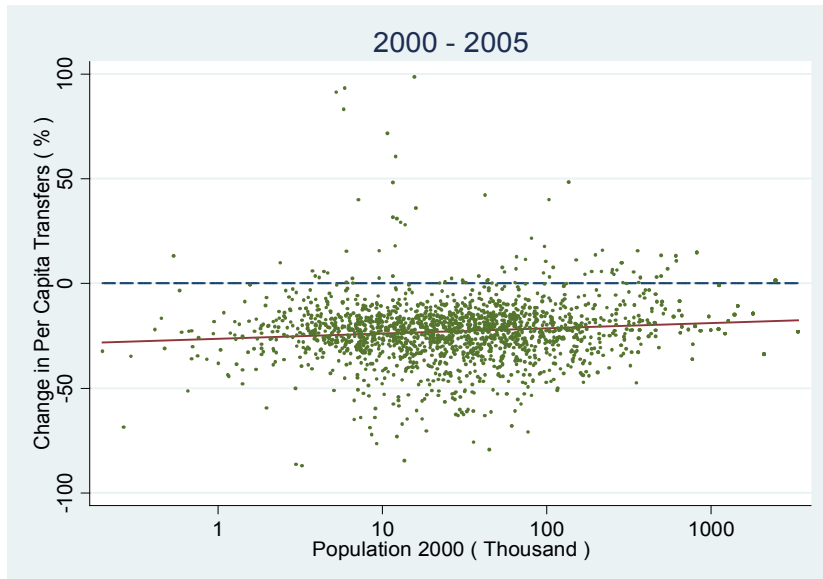
Figure 5. Trends of the Local Allocation Tax (LAT) Grant, the National Treasury Disbursement, and the Total Intergovernmental Transfers



Source: Chihō Zaisei Chōsa Kenkyū Kai. Various issues.

Note: Total transfers are calculated by adding the total amounts of the LAT grant and the national treasury disbursement.

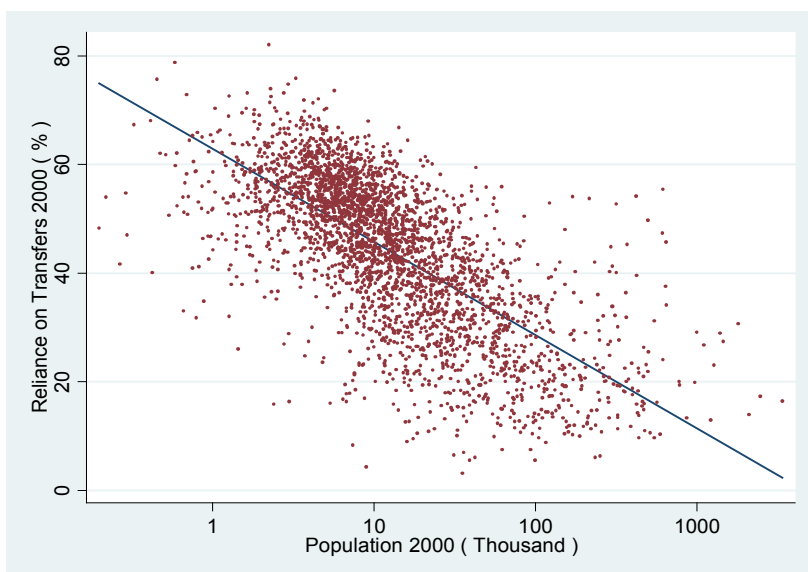
Figure 6. Municipal Size and the Change in Per Capita Transfers



Source: Chihō Zaisei Chōsa Kenkyū Kai. Various issues.

Note: The unit of observations is municipality. X-axis is the municipal population in 2000 (log). The X-axis label shows the actual population (thousand). Y-axis is the percent change in the per capita intergovernmental transfers to municipality from 2000 to 2005 (%). The dashed line shows $y = 0$. The solid line is the linear line based on the regression of the change in the intergovernmental transfers on the municipal population.

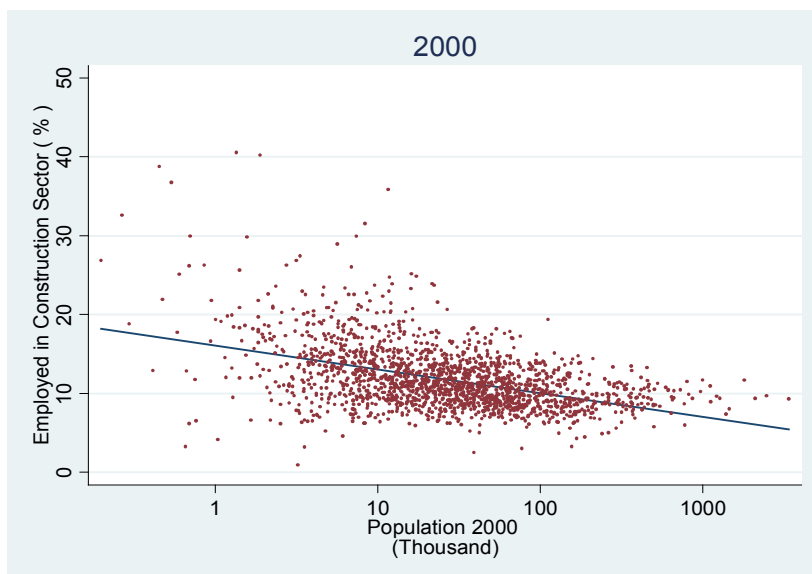
Figure 7. Municipal Size and the Reliance on Intergovernmental Transfers, 2000



Source: Chihō Zaisei Chōsa Kenkyu Kai. Various issues.

Note: The unit of observations is municipality. X-axis is the municipal population (log) in 2000. The X-axis label shows the actual population (thousand). Y-axis shows the percentage of the intergovernmental transfers in the municipal revenue in 2000. The solid line is the linear line based on the regression of the percentage of the intergovernmental transfers in the municipal revenue on the municipal population.

Figure 8. Municipal Size and the Percentage of the Workers Employed in the Construction Sector, 2000



Source: Chihō Zaisei Chōsa Kenkyu Kai. Various issues.

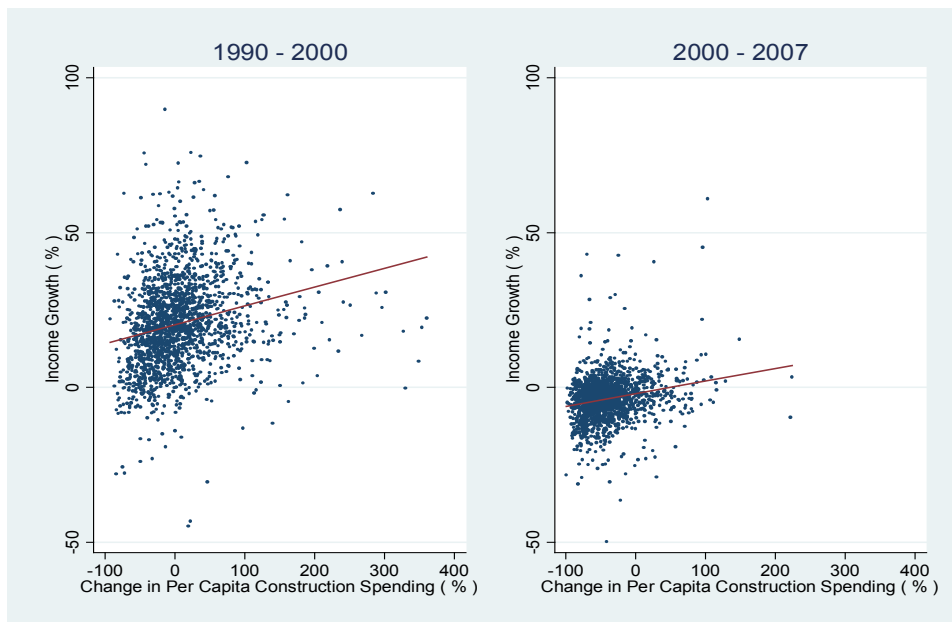
Note: The unit of observations is municipality. X-axis is the municipal population (log) in 2000. The X-axis label shows the actual population (thousand). Y-axis shows the percentage of the workers who are employed in the construction sector in 2000. The solid line is the linear line based on the regression of the percent employed in the construction sector on the municipal population.

municipal population and the percentage of the workers in municipality employed in the construction sector as of Fiscal Year 2000. The percentage of the workers employed in the construction sector is higher for small municipalities, suggesting that the adverse effect of the reduction of public works is more pronounced in such places.

Thus, the uniform cutback of the transfers may have had severe negative effects on rural areas and widened the rural-urban income disparity. To test whether this expectation is corroborated by data, let us first compare Figure 1 and Figure 5. Since around 2000, inequality across regions rose, which coincided with the fall in the intergovernmental transfers. Another empirical pattern worth noting is that in the 1970s and 1990s, the regional inequality shrank, while the aggregate amount of the intergovernmental transfers increased.

Turning to the municipal-level data, Figure 9 presents the association between the change in the per capita expenditure for ordinary construction projects by municipal governments and the growth rate of the per capita income for the 1990-2000 and the 2000-2007 periods (Chihō Zaisei Chōsa Kenkyū Kai, various issues). I use the expenditure data instead of the revenue data since it seems that the expenditures by municipal governments capture more accurately the amount of public works in the municipality and are directly tied to the well-being of the residents. The relationship is positive; municipalities whose per capita spending on the ordinary

Figure 9. Change in the Per Capita Expenditure for Ordinary Construction Projects and Income Growth



Source: Chihō Zaisei Chōsa Kenkyū Kai. Various issues.

Note: The unit of observations is municipality. X-axis is the percent change in the per capita expenditure for ordinary construction projects. Y-axis is the growth rate of the per capita income (%). The left panel shows the change from 1990 to 2000. The right panel shows the change from 2000 to 2007. The solid lines are the linear lines based on the regressions of the income growth on the change in the per capita construction spending.

construction projects increased more had the tendency to have higher income growth rates. The relationship holds even when the population size is taken into account. A regression of the income growth rate (%) on the municipal population size (log) and the change in per capita expenditure for ordinary construction projects (%) shows that the effect of the change in the construction expenditure is positive and statistically significant at 1% level for both periods. The effect of the population size on income growth is negative in the 1990s but positive in the 2000s. Both are statistically significant at 1% level. (The results are not reported.) Although further empirical analyses are required, there is partial evidence to support the claim that the structural reforms, the cutback of the intergovernmental transfers in particular, might have had significant impacts on the widening of the regional income disparity.

4. Political Consequences of the Growing Regional Inequality

The analyses so far revealed the rising inequality and rural stagnation under the Koizumi Administration. They also provide partial evidence suggesting the coincidence of the widening inequality with the cutback of the transfers to localities. Regardless of whether or not the structural reforms caused the regional inequality to widen, the evidence clearly indicates that rural areas did stagnate in the last decade. Then, did the growing regional income disparity have any political consequences? More specifically, does it explain why the LDP fell out of power in 2009? This section incorporates municipal-level electoral data and provides two findings. First, although the LDP historically had strong support base in rural areas, the LDP-led coalition's vote shares in its former strongholds dropped significantly in 2005 and 2009. Second, the growth in the per capita municipal income was positively associated with the change in the LDP-led coalition's vote share at municipal level.

4.1. Note on Theoretical Expectations

A useful starting point in this discussion is the idea of retrospective voting, which argues that "voting in response to economic concerns is (1) retrospective, (2) incumbency-oriented, and (3) based upon the results of economic policies, and not upon the actual policies themselves (Kiewiet and Rivers 1984, 370)." According to a classic assumption in political economy, a voter, facing alternative electoral platforms, chooses the one that is closest to his or her ideal point (Downs 1957). However, it is costly for them to collect all the relevant information, predict precisely how their utilities are going to be like under different platforms, and make choices based on such considerations for each election. Voters instead utilize readily accessible information, which is whether and to what extent their wellbeing changed while the incumbent party was in power (Kramer 1971). If we follow the idea of retrospective voting and assume

that income is a viable measure of the incumbent performance for the voters (Levitt and Poterba 1999), then it is reasonable to expect that the LDP suffered electoral slumps in rural areas, where the per capita income dropped.

4.2. Urbanness and Electoral Outcome

Figures 10 and 11 show the municipal-level vote shares of the LDP's and its coalition partners' candidates in the Lower House elections before and after the electoral reform, respectively. Figure 12 shows the relationship between the municipal population size and the change in the LDP-led coalition's vote shares in the Lower House elections after 2000. As Figure 10 shows, the LDP historically had high vote shares in small-sized municipalities. The 1994 electoral rule change in the Lower House mitigated malapportionment and reapportioned seats to urban areas (Horiuchi and Saito 2003). However, the party continued to have high vote shares in rural areas even after the electoral reform, as observed in Figure 11 (See Rosenbluth, Saito and Yamada 2009 for district-level patterns).

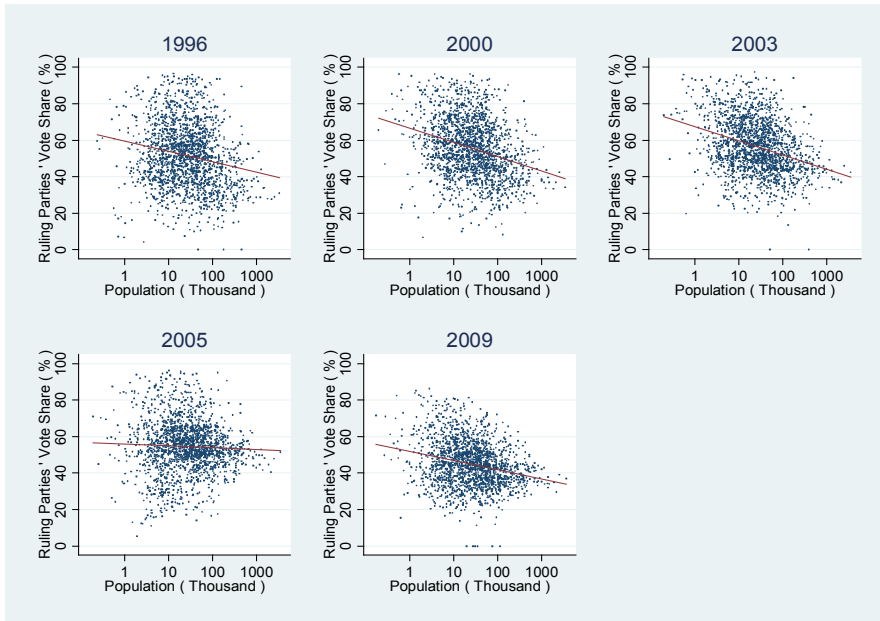
Nonetheless, the 2005 and 2009 elections present remarkably different patterns. In contrast to the previous elections, the association between the scale of municipalities and the LDP-led

Figure 10. Municipal Size and the LDP-led Coalition's Vote Shares in the Lower House Elections, 1980-1993



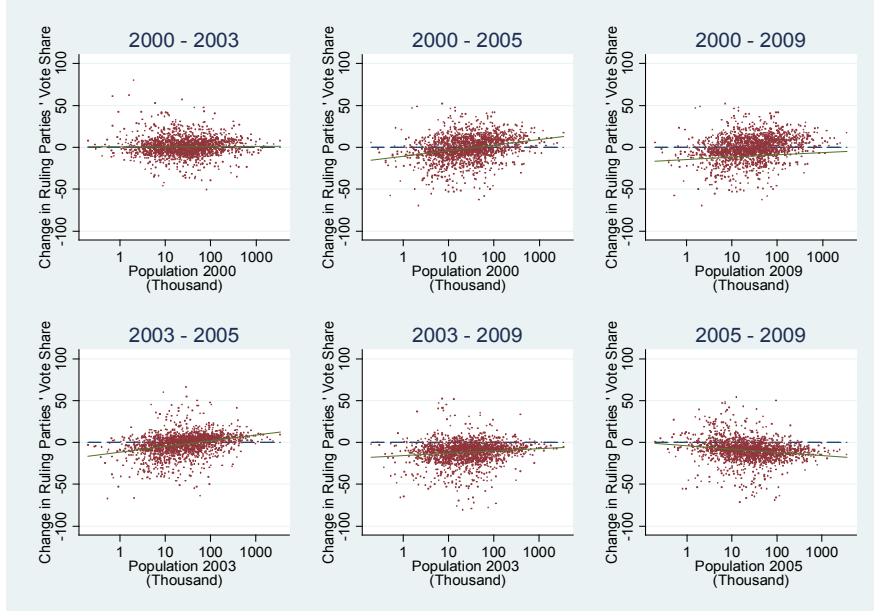
Note: The unit of observations is municipality. X-axis is the municipal population (log). The X-axis label shows the actual population (thousand). Y-axis is the LDP-led coalition's vote share in municipality, which is obtained by dividing the number of votes it received by the number of votes cast in municipality and multiplying it by 100. The solid lines are the linear lines based on the regressions of the LDP-led coalition's vote share on the municipal population.

Figure 11. Municipal Size and the LDP-led Coalition's Vote Shares in the Lower House Elections, 1996-2009



Note: The unit of observations is municipality. X-axis is the municipal population (log). The X-axis label shows the actual population (thousand). Y-axis is the LDP-led coalition's vote share in municipality. The vote share data are those of the single member districts. The solid lines are the linear lines based on the regressions of the LDP-led coalition's vote share on the municipal population.

Figure 12. Municipal Size and the Change in the LDP-led Coalition's Vote Shares in the Lower House Elections, 2000-2009



Note: The unit of observations is municipality. X-axis is the municipal population (log). The X-axis label shows the actual population (thousand). Y-axis is the change in the LDP-led coalition's vote share in municipality (percentage points). The solid lines are the linear lines based on the regressions of the change in the LDP-led coalition's vote share on the municipal population.

coalition's vote shares is quite weak in 2005. The ruling parties' vote shares in rural areas remained low in the 2009 election. As Figure 12 demonstrates, compared with the 2000 and 2003 elections, the LDP's vote shares in 2005 decreased in rural areas, while it increased in urban areas. The LDP's vote shares in 2009 were lower than in the 2000 or 2003 elections in many places. But the magnitude of the decrease was larger in rural areas.

4.3. Income Growth and LDP's Electoral Performance

The LDP's electoral slump in the rural areas coincided with the period during which the rural areas experienced negative growth in the per capita income and went through economic stagnation in comparison with the urban areas (Figure 3). Is there an empirical relationship between these two phenomena? Figure 13 demonstrates the association between the growth rate of the municipal per capita income and the change in the LDP-led coalition's vote shares. The first panel shows the relationship between the two variables from 2000 to 2003, while the second and the third show that from 2000 to 2005 and from 2003 to 2005, respectively. Income data for 2009 is not available as of December 2010. 2000 was the last election before Koizumi assumed power and also the year when the regional income disparity was relatively low. As the figure shows, the growth rate of the per capita income was positively associated with the change in the ruling coalition's vote shares in the Lower House elections in each of the three periods.

The relationship is positive and statistically significant even after one takes into account other relevant characteristics of municipality. Table 1 reports the results of the regressions in which the dependent variable is the change in the LDP-led coalition's vote shares (percentage points) and the key independent variable is the growth rates of the per capita income (%). Two models are used for each of the three periods covered by Figure 13. Model 1 is the bivariate regression of the change in the vote shares on the income growth rates. Model 2 controls for the change in the municipal population (%), the change in the per capita transfers to municipality (%), the municipal population size (log), the change in the fraction of the workers in municipality who are employed in the construction sector (percentage points), and the change in the fraction of the elderly population in municipality (percentage points). As Table 1 demonstrates, the coefficient on the growth rates of the per capita income is positive and statistically significant for all the models.

The results are substantively important. For instance, according to Model 2 in the 2000-2005 period, the coefficient on the income growth rates is 0.68. All else equal, a percent increase in the per capita income is associated with 0.68 percentage points increase in the LDP-led coalition's vote share. If the decrease in the per capita income is 6% (one standard deviation), it is associated with approximately 4 percentage points decrease in the ruling coalition's vote share. Given the fact that a small change in vote share can alter single-member district races, and considering the tendency of a vote share change to generate a much larger seat share

Table 1. The Effects of the Income Growth on the LDP-led Coalition's Vote Share

	2000-2003		2000-2005		2003-2005	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
△ Income Per Capita (%)	0.33*	0.43**	0.69***	0.68***	0.61***	0.33**
	(0.17)	(0.19)	(0.12)	(0.12)	(0.13)	(0.14)
△ Population (%)		0.02		-0.03		-0.02
		(0.04)		(0.05)		(0.04)
△ Per Capita Transfer (%)		-0.03		0.00		-0.03
		(0.03)		(0.02)		(0.02)
Population (log)		0.52*		1.96***		1.63***
		(0.29)		(0.38)		(0.24)
△ Employed in Construction Sector (percentage points)		-1.99***		0.41		4.55***
		(0.66)		(0.49)		(0.97)
△ Elderly Population (percentage points)		1.84**		1.90***		1.02
		(0.76)		(0.54)		(0.92)
Constant	3.32***	-7.41*	7.74***	-20.98***	2.69***	-16.16***
	(1.14)	(3.84)	(0.89)	(4.69)	(0.41)	(3.10)
Observations	1798	1797	1798	1797	1798	1797
R-squared	0.01	0.03	0.06	0.13	0.02	0.11

Note: The unit of observations is municipality. The dependent variable is the change in the LDP-led coalition's vote share in the Lower House elections. All the models are estimated by weighted OLS regressions. For the 2000-2003 and the 2000-2005 periods, the weight is the municipal population in 2000. For the 2003-2005 period, the weight is the municipal population in 2003. Robust standard errors are reported in parentheses. The elderly population and the fraction of the construction workers in 2003 are linearly interpolated using the 2000 and 2005 Census data. *** p<0.01, ** p<0.05, * p<0.1

Figure 13. Income Growth and the Change in the LDP-led coalition's Vote Share



Note: The unit of observations is municipality. X-axis is the growth rates of the per capita income (%). Y-axis is the change in the LDP-led coalition's vote share in municipality (percentage points). The solid lines are the linear lines based on the regressions of the change in the LDP-led coalition's vote share on the income growth.

change in the majoritarian system (Taagepera 1973; Tufte 1973), I speculate that the change in the per capita income is relevant for explaining political changes in recent years.

5. Summary and Discussion

In this paper I have shown that (1) regional income inequality increased after Koizumi assumed power although it was not an unobserved pattern in the past (e.g. 1980s); (2) the increase in inequality coincided with the stagnation of the rural areas; (3) there is some evidence suggesting that fiscal austerity, particularly the cutback of transfers to local governments, led to the widening of the disparity; and (4) the LDP's vote shares in rural areas decreased during this period, and the decrease in the municipal per capita income was associated with the decrease in the party's vote shares.

These are obtained from descriptive information and I do not mean to claim to have unpacked any causal relationships in a strict sense. Further theoretical models and empirical investigations are required in future works. Meanwhile, if we assume that the empirical analyses presented here come close to showing what have actually happened, two puzzles regarding the findings are worth mentioning.

First, the enormous transfers to rural areas were apparently ineffective for boosting their incomes in the 2000s. One might wonder how and why, in spite of the generous transfers and the public works in the 1990s, the rural areas stagnated after the transfers were reduced. If the money was spent in such a way that did not help the rural economy grow autonomously in the long run, then it is perhaps unsurprising to observe their stagnations when the cutback was made. Then, the question, which is beyond the scope of this paper, is why the public resources were spent in such an unproductive way and whether it was politically profitable to do so.

Second, if the structural reforms were bound to alienate the core supporters of the ruling party (in this case rural voters) and generate harsh political backlash against the party, it is not obvious why the LDP chose to implement such a self-destructive policy. One interpretation is that the recession in the 1990s forced the government to provide fiscal stimulus, which enabled municipalities in rural areas to have positive growth rates. However, recession entailed the shrinking tax revenues, which required the government to pay for the generous spending by running deficits. As a result, as soon as the economy recovered or showed some indications of recovery, the government was forced to initiate fiscal reconstruction, of which fiscal austerity, including the cutback of the intergovernmental transfers, was an integral part. A more political view is that the structural reforms were actually the best available strategy for the LDP. Not implementing such policies could have resulted in its electoral defeat much earlier than 2007 or 2009. After the 1994 electoral reform introduced a system based on single member districts and reapportioned seats from rural to urban areas (Horiuchi and Saito 2003), winning high vote

shares in rural areas was not enough to win a Diet majority any more (Rosenbluth, Saito and Yamada 2009). In this sense, sustaining the previous transfer scheme was perhaps not only fiscally but also politically unsustainable, given the growing importance of urban voters and the new strategic environment.

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