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The effects of the new fiscal rule and creative accounting: Empirical evidence from Japanese municipalities*

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Abstract

The purpose of this paper is to analyze stock-flow adjustments of creative accounting in Japanese municipalities after the introduction of a new fiscal rule using a difference-in-differences method. We contribute to the literature of creative accounting by analyzing the interdependency of the new fiscal indexes, which include three flow indexes and one stock index, and by identifying the impacts of the new fiscal rule. In addition, we focus on both the “targeted indexes” and the “untargeted indexes” of the new fiscal rule because some of the municipalities might take advantage of loopholes in the new fiscal rule to improve their “targeted indexes”. Our main contribution is the finding that the municipalities increase their money transfers to the public enterprise accounts, which is one of the “untargeted indexes”, after the introduction of the new fiscal rule to avoid the applicable punishments. This phenomenon is creative accounting because the municipalities postpone improving their true fiscal deficits.

JEL Classification: H72, H73, H74, H77

Keywords: fiscal rule, creative accounting, stock-flow adjustments, difference in differences

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1 Introduction

Alesina and Perotti (1996) show that fiscal policy encouraging the issuance of government bonds tends to expand fiscal deficits due to political influences. They argue that the expansion of the fiscal deficit is caused by a lack of specific fiscal rules or the low transparency of budget institutions. Previous studies on the positive effects of fiscal rules are conducted using country- or state-level data from places such as the US, the EU, or the OECD (e.g., Eichengreen and Bayoumi (1994), Poterba (1994), von Hagen and Harden (1995), Kirchgässner (2002), Debrun et al. (2008)). Similarly, some studies investigate the effects of the fiscal rules on local government and support the effectiveness of fiscal rules (e.g., Luechinger and Schaltegger (2013), Foremny(2014), Chatagny (2015), Grembi et al. (2016), Alpino et al. (2018), Burret and Feld (2018a), Burret and Feld (2018b)). Most previous studies show that a relationship exists between fiscal rules and fiscal deficits, and reveal that fiscal deficits are likely to be small when fiscal rules are strict.

To the best of our knowledge, however, some studies note that fiscal deficits may increase when fiscal rules are suddenly changed or that the transparency of the budget institution is decreased even when fiscal rules are strict. Milesi-Ferretti (2003) conducts a theoretical analysis suggesting that fiscal adjustment or creative accounting can easily result when introducing fiscal rules under fiscal institutions with low transparency. Moreover, even if fiscal rules have a strong effect on improving fiscal conditions, introducing overly strict fiscal rules may result in the use of accounting gimmicks including creative accounting and fiscal gimmicks.

In addition to the theoretical analysis, although the definitions of creative accounting differ depending on the country or studies, some studies empirically investigate creative accounting using country-level data (e.g., Koen and van den Noord (2005), von Hagen and Wolff (2006), Beetsma et al. (2009), Maltriz and Wüste (2015)). In particular, von Hagen and Wolff (2006) define creative accounting as “stock-flow adjustments” including the issuance of zero-coupon bonds, transactions in public assets, the privatization of public enterprises, the manipulation of record timing, etc. As a result, the study reveals that there are large differences between the accumulated fiscal deficits as flow variables and debt stocks as stock variables on country-level data from 1980 to 2003.

Moreover, creative accounting in local governments has been empirically studied. Balduzzi and Grembi (2011) focus on changes in the fiscal rules of Italian municipalities to investigate creative accounting but find that the municipalities are not affected by changes in the fiscal rules. On the other hand, Clémenceau and Soguel (2017) detect creative accounting in Swiss cantons. Furthermore, Burret and Feld (2018a) reveal that Swiss cantonal debt brakes reduce fiscal deficits, but the debt brakes cause some unintended effects including an evasion into unconstrained accounts, emphasizing the importance of constraining all accounts¹. Therefore, the study of creative accounting in local governments remains controversial.

In this paper, we identify the fiscal effects of the new fiscal rule in Japan - called “The Law Relating to the Financial Soundness of Local Governments” (*Chihou Koukyoudantai no Zaisei no Kenzenka ni Kansuru Houritsu* in Japanese) - which focuses on creative accounting including stock-flow adjustments by applying a difference-in-differences (DID) method and using data from FY2007 to FY2010.

¹Goto and Yamamoto (2019) investigate creative accounting on municipal mergers.

The new fiscal rule introduces four fiscal indexes comprising three flow indexes and one stock index. These new indexes target not only the general accounts of each municipality but also those of extra-governmental organizations to reveal the true fiscal conditions of all public sector entities. Before the introduction of the new fiscal rule, the fiscal management of all municipalities operated under the former fiscal rule for approximately 60 years. However, because the former fiscal rule included only two of the indexes relating to the fiscal balances and targeting the general accounts, some of the municipalities were easily able to shift a portion of the fiscal deficits in their general accounts to extra-governmental organizations to hide their poor fiscal condition. The new fiscal rule was introduced in FY2008 to address this problem.

Then, on April 1st, 2008, the central government enforced the new fiscal rule and disclosed the formulas of the new fiscal indexes to the municipalities on April 28th, 2008. We use the time lag of institutional change because the municipalities cannot calculate their new fiscal indexes by themselves before the enforcement of the new fiscal rule. In particular, some of the municipalities that suffer from a large former redemption index might engage in creative accounting under the new fiscal rule.

We contribute to the literature of creative accounting in the following two ways. First, we focus on the effects of the four new fiscal indexes that are employed due to the introduction of the new fiscal rule in terms of creative accounting by stock-flow adjustments. From a global perspective, this new fiscal rule in Japan is atypical because, in many countries, local governments introduce either balanced-budget or debt-limit rules. Previous studies investigate the effects of only one type of fiscal rule. However, the new fiscal rule in Japan simultaneously adopts three flow indexes and one stock index for the municipalities. These three flow indexes have both “yellow cards”, which require the municipalities to plan for early financial soundness, and “red cards”, which require the municipalities to be under the control of the central government to rebuild stable financial conditions. The stock index does not include a red card. Thus, some of the municipalities that suffer from large fiscal deficits may have an incentive to engage in creative accounting to avoid fiscal management under the supervision of the central government. Thus, these municipalities may decrease their flow indexes by increasing their stock indexes, which does not include a red card. Moreover, the Japanese new fiscal rule is clearly different than that of other countries. The new fiscal indexes target not only the general accounts but also extra-governmental organizations. Another contribution of this study is its focus on extra-governmental organizations after the introduction of the new fiscal rule. Thus, we consider creative accounting including stock-flow adjustments that may occur among all of the public sector accounts.

Second, to investigate the creative accounting within legal limitations, we also focus on the differences in the “targeted indexes” and “untargeted indexes” of the new fiscal rule. In this paper, “targeted indexes” refer to the four new fiscal indexes, and “untargeted indexes” refer to the indexes of reserved funds and to money transfers from the general accounts to the public enterprise accounts. Even if the municipalities appear to improve their new fiscal indexes, we must investigate whether they engage in creative accounting without breaking the new fiscal rule by decreasing the reserved funds or increasing money transfers. For example, under the former fiscal rule, some of the municipalities hid the fiscal deficits of extra-

governmental organizations by decreasing their funds or by increasing the money transfers from the general accounts to the other accounts. Through this behavior, the municipalities can postpone improving their fiscal conditions. We consider that the behavior is one of the stock-flow adjustments of creative accounting according to von Hagen and Wolff (2006). Therefore, we focus not only on the “targeted indexes” of the new fiscal rule but also on the “untargeted indexes”, such as reserved funds and money transfers.

This paper is structured as follows. Section 2 explains the institutional background and former fiscal rule. Section 3 presents Japan’s new fiscal rule enacted in 2008. Section 4 explains the empirical method used. Section 5 presents the estimation results and robustness checks, Section 6 discusses our results and Section 7 concludes the paper.

2 Institutional background

2.1 Local public finance in Japan

In this section, we briefly describe the institutional background of Japan’s local public finance and the fiscal rules. The public sector, based on the System of National Accounts, comprises the central government, local government, and social security fund. In FY2007, the gross domestic expenditures of Japan were 515 trillion Japanese yen (JPY), which was approximately 5 trillion United States dollars (USD) at an exchange rate of 100 JPY to one USD. Local government’s expenditure includes 57 trillion JPY (0.57 trillion USD), while the central government’s expenditure is 20 trillion JPY (0.2 trillion USD). The proportion of the local government’s expenditure relative to the gross domestic expenditures is approximately 11.2 % in FY2007, which is approximately three times higher than that of the central government. This finding indicates that the local government is highly dependent on intergovernmental transfers from the central government.

In terms of the scale of the settled accounts, the ratio of the central to the local government’s tax revenue was six to four in FY2007. On the other hand, the ratio of the central to local government’s expenditure was four to six. Thus, the central government’s revenues are larger than those of the local government, but the former’s expenditures are smaller. This gap is filled by intergovernmental transfers from the central to local government. On average, the intergovernmental transfers account for 30 % of local government’s total revenue.

Japan’s government exists in a three-layer system: the central, prefectural, and municipal governments (cities, towns, and villages). Local governments play an important role in providing many public services, including public education, public welfare, public health, fire services, construction work, and waste disposal. In the municipalities, the expenditure size comprises public welfare, construction work, and debt servicing expenses. In addition, classified by expenditure categories, municipal expenditures can be divided into obligatory expenses (personnel expenses, social assistance expenses, and public debt payments); investment expenses, including ordinary construction expenses; and other expenses, including reserve funds. In the 2000s, social assistance expenses and public debt payments gradually increased, while ordinary construction expenses decreased.

2.2 Classification of the municipalities

The number of the municipalities was 1,799 at the end of FY2007, which was divided into 783 cities (*shi*), 815 towns (*machi*), and 201 villages (*mura*). The cities are also divided into four categories: ordinance-designated cities (*Seirei Shitei toshi*), core cities (*Chukaku shi*), special-case cities (*Tokurei shi*), and standard cities. The cities comprise 17 ordinance-designated cities, 35 core cities, 44 special-case cities, and others.

The cities have different types of authorities and fiscal resources on the administration. Ordinance-designated cities are those with a population of 500,000 or more and are designated by a cabinet order under a special provision. Such cities have nearly the same level of authority and fiscal resources as prefectures. Core cities are those with a population size of at least 300,000, and part of their authority is delegated by prefectures, although the scope of their authority is smaller than that of ordinance-designated cities. Similarly, special-case cities are those with a population size of at least 200,000, and part of their authority is delegated by prefectures, although the scope of their authority is smaller than that of core cities. Cities are defined as having a population size of at least 50,000; however, the authority differs little among cities, towns, and villages.

2.3 Public accounts for the municipal government

Normally, in public finance, the accounts of the municipal government are divided into general and special accounts. Special accounts consist of public enterprise accounts, such as those for transport businesses, electricity businesses, gas businesses, and residential land development projects. However, because each municipality provides different services depending on the local conditions, the types of special accounts differ.

To compare the accounts of all municipalities uniformly, Japan's central government establishes "ordinary accounts" that cover the general accounts and a common component of the special accounts. Thus, we can elucidate the fiscal conditions of the municipalities and conduct a statistical comparison among them using ordinary and other public enterprise accounts.

The municipal governments include some extra-governmental organizations, including partial administrative associations (*Ichibu Jimu Kumiai*), wide-area local public bodies (*Kouiki Rengou*), local public corporations (*Chihou Kousha*), and third-sector enterprises. These organizations have accounts independent from the ordinary accounts. Partial administrative associations and wide-area local public bodies are extra-governmental organizations that cooperate with neighboring municipalities to provide public services, including fire rescue, waste-removal services, and public long-term care insurance. Partial administrative associations provide a single service in cooperation with neighboring municipalities. Wide-area local public bodies provide multiple services in cooperation with neighboring municipalities. Third-sector enterprises are joint enterprises between the public and private sectors.

2.4 Former fiscal rule

2.4.1 Former balance index

Before the new fiscal rule was enacted in FY2008, the fiscal management of all of the municipalities was conducted under “The Law on Special Measures for the Promotion of Local Financial Reconstruction” (*Chihou Zaisei Saiken Sokushin Tokubetsu Sochi Hou*), which is referred to as the former fiscal rule. The former fiscal rule was enforced from FY1955 to FY2009 and targeted only the ordinary accounts for the municipalities.

The central government established a “former balance index” (*Jisshitsu Shuushi Hiritsu*) for local government and define the financial reconstruction stage (red card) in the former fiscal rule. If the former balance index was lower than -20%, the municipalities had to undertake fiscal reconstruction under the control of the central government and were not allowed to issue local bonds. The municipalities under the control of the central government had to formulate a fiscal reconstruction plan with the agreement of the minister of the Ministry of Internal Affairs and Communications (MIC). Thus, since the former fiscal rule had only the red card criterion, not the yellow card, the municipalities suddenly face the problem of fiscal reconstruction when the former balance index exceeds -20%.

Additionally, “The Local Public Enterprise Law” (*Chihou Koei Kigyo Hou*), which corresponds to the former fiscal rule for the municipalities, was applied to the public enterprise accounts. Although public enterprises had adopted a financially independent accounting system approximately 60 years previously, the system in Japan is quite far removed from international accounting standards or those used in private companies.

For example, the notice of the MIC relating to public enterprises approved the municipalities’ implementation of an expense of “money transfers” (*Kuridashikin*) to such an extent as they consider necessary from the ordinary accounts to the public enterprise accounts or other accounts for management.

2.4.2 Former redemption index

In addition to the former fiscal rule, the central government practically managed the permission system of the bond issuance for local governments from FY1947 to FY2006 based on “The Local Autonomy Law” (*Chihou Jichi Hou*), which is a different legal basis from the former fiscal rule. The aim of the permission system of the bond issuance was for the central government to impose a temporary limitation of the bond issuance to control local public finance for restoration in the post-WWII period. The law required temporal permission for bond issuance by the minister or prefectural governor.

However, the permission system for bond issuance had been managed previously by the central government as a customary practice of the local public finance system without a clear legal basis. The official notices for bond issuance permission from the administrative vice-minister (*Chihousai Hakkou Kyoka Houshin*) were frequently announced to reduce bond issuance and were sufficient for local governments over the past 60 years. Although the notice had no legal basis, it strongly affected fiscal management, especially the ordinary accounts of the municipalities (See, for example, Doi (2007), Mochida and Hayashi (2018) for detail.).

To manage the permission system of bond issuance, the central government established a “former redemption index” (*Kisai Seigen Hiritsu*) and set some criteria for the ordinary accounts. If the former redemption index ranged from 15% to 20%, the municipalities were called a caution group, and they then had to formulate a bond management plan, on which no penalties were imposed. On the other hand, the municipalities whose indexes ranged from 20% to 30% were called a partial limitation group, and those whose indexes were more than 30% were called a strict limitation group. These two limitation groups had to obtain permission from the central or prefectural government to issue new bonds. Thus, these criteria were exogenously determined by the upper government under the former fiscal rule.

2.4.3 Problems with the former fiscal rule

The former fiscal rule had many problems, making the high transparency and accountability of fiscal management difficult because those indexes were based on different laws. Considering these points, the MIC summarized the problems of the former fiscal rules as follows: (1) The disclosure of fiscal information is inadequate, (2) the red card criterion exists only for the balance index and no yellow card criterion exists, (3) the balance index is a flow index and targets only the ordinary accounts, and (4) public enterprises have the same problems.

Even if some municipalities seemed to have better fiscal conditions, they made it seem so by drawing on “reserve funds” (*Tsumitatekin*) that were kept for the repayment of debts in the future. Some municipalities were easily able to shift a part of the fiscal deficits of their ordinary accounts to extra-governmental organizations to hide poor fiscal conditions since the former fiscal rule included only two of the indexes relating to fiscal balance and the redemption indexes of the ordinary accounts as a target.

Other municipalities sometimes manipulated the fiscal conditions of the public enterprise accounts by increasing the amounts of the money transfers from the ordinary accounts to the public enterprise accounts beyond the expected level of the central government (*Kuridashi Kijyun*) to compensate for the public enterprises’ fiscal deficits (For example, Konishi (2014)). This phenomenon occurred because the public enterprises are divided in the law into two groups between regulated (*Hou Tekiyou*) and non-regulated enterprises (*Hou Hi Tekiyou*), making the money transfers difficult to monitor. The amounts of the money transfers for regulated enterprises including water, transportation, electricity, gas, hospital services, etc., were monitored by the central government, but those for non-regulated enterprises including small-scale water service, the management of sewerage service, etc., were weakly monitored. Thus, the criterion of the money transfers for the public enterprises was proposed by the central government each year as a preferable transfer level, but the money transfers for the sewerage services of non-regulated enterprises quite often exceeded the criterion. Thus, the fiscal conditions of the extra-governmental organizations were difficult to observe under the former fiscal rule because these organizations did not have a certain index and no penalties were in place for the money transfers.

As an unusual case apart from creative accounting, Yubari city in Hokkaido prefecture went practically fiscal bankrupt in March 2007, in which its former balance index achieved -791%. This event was due to illegal creative accounting between the ordinary accounts and extra-governmental organizations, such as third-sector

enterprises. Because Yubari city transferred large debts, which they had to repay, to the other accounts, it accumulated debts approximately 65 times as large as its tax revenue before bankruptcy. Thus, Yubari city has reconstructed its fiscal conditions with a severe restriction under the control of the central government from 2007 to 2027.

3 New fiscal rule in 2008

3.1 Introduction of the new fiscal rule

To improve fiscal conditions and work towards a high level of transparency in fiscal management, the central government enacted “The Law Relating to the Financial Soundness of Local Governments” (*Chihou Koukyoudantai no Zaisei no Kenzenka ni Kansuru Houritsu*) for local governments, which is referred to as the “new fiscal rule”. The new fiscal rule was enforced in FY2008 and included four new fiscal indexes.

Fig. 1 shows the timeline for the introduction of the new fiscal rule. Japan’s fiscal year begins in April. The new fiscal rule was promulgated on June 22, 2007 and announced the setting of the new fiscal indexes on December 7, 2007, but the detailed formulas of the new fiscal indexes were not decided at that time. The central government ordered local governments to disclose the new fiscal indexes from the settled account of FY2007. Thus, we can obtain the confirmed data of the new fiscal indexes in each municipality from FY2007.

The enforcement of the new fiscal rule means that, except for the fiscal indexes in FY2007, the municipalities are penalized if they do not meet the criteria and could come under the control of the central government. While the confirmed indexes of FY2007 carry no penalties, penalties are imposed after FY2008 if at least one index exceeds a criterion.

An important point of this enforcement of the fiscal rule is that the formulas of the new fiscal indexes were not disclosed to the municipalities in FY2007. The central government enforced the new fiscal rule on April 1, 2008. The formulas of the new fiscal indexes were disclosed on April 28, 2008, and then an explanatory meeting was held by the MIC to present detailed formulas for the municipalities on May 9, 2008. Based on the result of the meeting, the municipalities disclosed their confirmed indexes of FY2007 on November 28, 2008. Since the fiscal year in 2007 had already ended at the time of the formula’s disclosure, municipalities found it practically difficult to manipulate their indexes of FY2007 by using the methods described in the previous section, such as decreasing reserve funds, increasing money transfers, or hiding deficits.

This paper assumes that the new fiscal rule affects the municipal settled accounts after FY2008. Thus, we focus on both the timing of the announcement of the new fiscal rule in FY2007 and on the fiscal indexes after FY2008 to identify the fiscal effects of the introduction of the new fiscal rule.

3.2 New fiscal indexes

Fig. 2 presents the target accounts of the new fiscal indexes that measure the degree of municipal fiscal soundness. The new fiscal indexes comprise four fiscal indexes including both the revised balance and the revised redemption indexes:

three flow indexes and one stock index. These new indexes cover not only the ordinary accounts in each municipality but also extra-governmental organizations to reveal the true fiscal condition of the public sector.

The “balance index” is the ratio of the fiscal surplus of the ordinary accounts to the standard financial scale of the municipalities as a flow index².

$$Balance = \frac{Fiscal\ surplus}{Standard\ financial\ scale}$$

The standard financial scale includes the general revenues of the municipalities for each fiscal year, which consist of standard local tax revenues and local allocation tax grants (LAT grants) from the central government. An LAT grant is an unspecific grant for local governments. The number of LAT grants provided to each municipality is determined by the central government based on municipal fiscal shortages for each fiscal year³. The balance index covers only the ordinary accounts with nearly the same scope as the former fiscal rule.

The “consolidated balance index” is the ratio of the consolidated fiscal surplus of the ordinary accounts and the public enterprise accounts to the standard financial scale of the municipalities as a flow index.

$$Consolidated\ balance = \frac{Consolidated\ fiscal\ surplus}{Standard\ financial\ scale}$$

The consolidated balance index covers the ordinary accounts and the public enterprise accounts. Under the former rule, we were able to check for the bad debt only of each public enterprise. Although the municipalities generally manage public enterprises, the relationship between the ordinary accounts and the public enterprise accounts was difficult to confirm.

The “redemption index” is the ratio of the number of the redeemed bonds of the ordinary accounts, the public enterprise accounts, the partial administrative associations, and the wide-area local public bodies to the standard financial scale of the municipality as a flow index.

$$Redemption = \frac{Redemption\ of\ bond}{Standard\ financial\ scale}$$

The redemption index covers the ordinary accounts and the wide-area local public bodies and shows how much debt the municipalities must repay each year. However, the redemption index is calculated by excluding specific grants from the numerator of the index. Therefore, if the municipalities increase the number of specific grants they are awarded, they can reduce their redemption indexes.

²The balance and the consolidated balance indexes are the real deficit index (*Jishitsu Akaji Hiritsu*) and the consolidated real deficit index (*Renketsu Jishitsu Akaji Hiritsu*), respectively. We multiplied both indexes by -1 so we could compare them with the former balance index. In this section, we follow the “White Paper on Local Public Finance, 2007” that was published by the MIC. For details, see MIC (2007), and Appendix. A

³For further information on the LAT grant system, see Ihori (2009), Saito and Yunoue (2009), and Hirota and Yunoue (2017).

The “future burden index” is the ratio of the current outstanding balance of the future burden, including that of the debts of the local general account as well as other likely future payments. It represents the extent to which finances may be tight in the future. The future burden index covers all public sector entities in each municipality.

$$Future\ burden = \frac{Future\ burden}{Standard\ financial\ scale}$$

The numerator of the future burden index consists of the accumulated debts in the ordinary accounts and the debt burdens of extra-governmental organizations and includes the consolidated fiscal surplus as a stock variable. Thus, if the municipalities have a large debt burden in their third-sector enterprise accounts, their future burden indexes increase. However, the future burden index is calculated by excluding the estimated amount of specific grants and appropriable funds, including reserved funds and others, from the numerator of the index. Therefore, if the municipalities increase the amount of their specific grants or decrease their reserved funds, then they can reduce their future burden indexes.

The numerators of both the consolidated balance and the future burden indexes include, to some extent, estimated amounts of the money transfers from the ordinary to the other accounts, but the money transfers to both regulated and non-regulated enterprises remain important problems. Thus, we should investigate the money transfers in addition to the targeted indexes.

3.3 Criteria of the new fiscal indexes

Fig. 3 presents a diagram of the financial status of the local governments. The new fiscal rule establishes four new indexes and requires local governments to disclose them thoroughly with the aim of quickly achieving financial soundness or rebuilding.

The four new indexes include a number of financial criteria: For example, if the municipalities exceed the balance index by between -11.25 and -15%, depending on their fiscal size, they are within the early financial soundness restoration stage (yellow card) and must improve their fiscal conditions by themselves. In this case, the municipalities must formulate a financial soundness plan to be approved by local councils and conduct a mandatory external audit. Additionally, the municipalities must report on their implementation progress to local councils and via public announcements every fiscal year. If the early achievement of financial soundness is deemed very difficult, the MIC or the prefectural governor makes necessary recommendations. All four indexes include a yellow card.

Moreover, if the municipalities exceed the balance index of -20 %, they are within the financial rebuilding stage (red card) and must be fiscally managed under the control of the central government. These municipalities must perform a thorough financial rebuilding with the involvement of the central government. In this case, the municipalities must formulate a financial rebuilding plan to be approved by local councils and conduct a mandatory external audit. Additionally, they must obtain agreement on the financial rebuilding plan in consultation with the MIC.

Similarly, the criteria for the consolidated balance, redemption, and future bur-

den indexes are determined in the new fiscal rule. Although the future burden index includes a yellow card, for which the criteria is 350 %, it does not include a red card.

Fig. 4 presents the comparison of the criteria between the former and new redemption indexes. The formulas for both the former and new redemption indexes are similar, but those for the coverage among accounts are quite different. Because, after the introduction of the new fiscal rule, the coverage of the new redemption index is expanded to include not only the ordinary accounts but also the public enterprise accounts and other associations, each municipality must improve the fiscal conditions of the public enterprise and other accounts.

If the new redemption index is higher than 18 %, the municipalities must obtain permission from the central government to issue a new bond under the new fiscal rule. A different point is that the caution group of the former index, which ranged from 15 % to 20%, did not impose any penalties, but, in the new fiscal rule, the caution group requires agreement from the MIC for issuing new bonds.

We expect that the municipalities could not precisely calculate the new index in FY2007, because those formulas were disclosed on April 28, 2008. Therefore, the municipalities found it difficult to implement the creative accounting between the ordinary accounts and the other accounts in FY2007, and they must accept that situation. On the other hand, some municipalities that ranged in the caution group under the former rule might fiscally adjust their fiscal conditions among their related accounts after FY2008 to avoiding the deterioration of their new indexes because they are concerned with the new penalties associated with the yellow card.

4 Empirical framework

4.1 Identification strategy

In this section, we explain our identification strategy by applying the DID approach to identify the fiscal effects of the introduction of the new fiscal rule. We focus on the institutional change between the announcement of the new fiscal rule in FY2007 and its enforcement in FY2008.

Let Y_{it} denote an outcome variable, such as some fiscal indexes of interest. The subscript i represents the municipality, and t represents the fiscal year. Equation (1) presents the DID estimation model.

$$Y_{i,t} = \beta_1 T_i * 2008_t + \beta_2 T_i * 2009_t + \beta_3 T_i * 2010_t + \delta X_{i,t} + \gamma X_{i,T_0} \tau_t + \mu_i + \tau_t + \epsilon_{i,t} \quad (1)$$

where $X_{i,t}$ is the covariates of the municipality, μ_i is the fixed effects of municipality i , τ_t is the year fixed effects for year t , and $\epsilon_{i,t}$ is an error term. β is a parameter of interest, and δ is a parameter to be estimated.

The treatment group in this setup is the interaction terms between T_i where T is a treatment indicator for municipality i and year variables are from FY2008 to FY2010. To identify the fiscal effects of the new fiscal rule, we define a certain treatment group of the municipalities by applying the criterion of the former redemption index that was determined exogenously by the central government under the former rule. We did so because Japan, a country with centralized policy-making, rarely ex-

exploits sub-national policy changes for the DID estimation (See, for example, Meyer et al. (1995).)⁴. The new fiscal rule applies to the whole of each municipality, although it might largely affect the municipalities with worse fiscal conditions. Thus, the municipalities with relatively better fiscal conditions are used as a control group in the DID. The detailed assignment for the treatment group is described below in subsection 4.2.

Considering this situation, however, we should carefully set the assignment between the treatment and control groups. Therefore, we should consider interaction terms $X_{iT_0}\tau_t$ between the predetermined covariates and the year fixed effects. T_0 shows a pretreatment period. In our estimation, we apply the first year of the pretreatment period to T_0 . To control the correlation between the covariates and the year fixed effects with the treatment groups, we add the interaction terms that are the predetermined covariates multiplied by the year fixed effects with the treatment groups, following de Janvry et al. (2015) and Christfzik (2019). γ is a parameter to be estimated.

For example, after the introduction of the new fiscal rule, the municipalities with better fiscal conditions have conditions that are easier to improve than those with worse fiscal conditions. If such characteristics were completely time invariant, the fixed effect model would obtain consistent estimates. If not, the model would be not consistent due to selection bias as to whether the treatment group equals 1 or not. To address the problem of the assignment between the treatment and control groups being affected by the time-invariant predetermined covariates, we consider the interaction terms.

4.2 Data

In the DID model, we use the Japanese municipal data from FY2007 to FY2010 because the new fiscal rule has been in force since FY2008. The data on the municipal governments are derived primarily from the Statistics of the Final Accounts of Municipal Governments (*Shi Chou Son Kessan Jyokyo Shirabe*), Municipal Financial Situation list (*Zaisei Jyokyo tou Ichiran Hyou*) and the Digital Archive of Municipal Mergers (*Gappei Digital Archive*).

4.2.1 Sample

We use data from 1,776 municipalities from FY2007 to FY2010 in our estimation. Note that, however, we cannot obtain the new fiscal indexes before the introduction of the new fiscal rule even if the outline of the new indexes is disclosed (See, appendix A.). To calculate the new fiscal indexes, we definitely need to obtain the basic figures, such as the estimated amount of the burden, etc., for each municipality and extra-governmental organization. Although we obtain the data from FY2007 to the latest year on the website⁵, we are not allowed to obtain the basic figures before FY2006.

⁴Meyer et al. (1995) assigns high-earning workers to a treatment group and the low-earning workers to a control group for a DID estimation to examine the impact of increases in benefits for work-related injuries in the United States states of Kentucky and Michigan.

⁵See, the MIC website in Japanese (<https://www.soumu.go.jp/iken/zaisei/kenzenka/youshiki/index.html>). We tried to request for the disclosure of the official information to the MIC, but, unfortunately, we did not obtain the basic figures for the new fiscal indexes before FY2006.

Additionally, to evaluate the fiscal effects of the new fiscal rule properly, we did not use data from FY2011 because a number of the municipalities were severely damaged by the Great East Japan Earthquake on March 11, 2011. In the subsequent years, these municipalities received many kinds of support, including a large number of special grants issued by the central government and others. We dropped the data from FY2011 in this paper to avoid the effects of the earthquake.

Moreover, many municipalities chose to merge, especially between FY2004 and FY2005. The number of municipalities rapidly decreased from 3,232 in FY1998 to 1,821 in FY2005. This result is because the central government enforced the special municipal mergers law and induced municipalities to choose to merge by using special treatments such as special grants and bonds. Hirota and Yunoue (2017) reveal that the merged municipalities increased the public investment expenses and the local bonds for becoming free-riders on their partners. Therefore, we use the data from FY2007 to FY2010 that excludes the merged municipalities after FY2007. However, the data includes the merged municipalities that chose to merge up to FY2005, which are controlled in our estimation.

In addition, since Yubari city is under the control of the central government in the new fiscal rule, we exclude Yubari city in our estimation. The future burden index of Yubari city was more than 1,000 % for a few years.

4.2.2 Treatment group

On December 7, 2007 the central government set the new fiscal indexes for the municipalities. The central government began enforcing the new fiscal rule on April 1, 2008 and disclosed the formulas of the new fiscal indexes to the municipalities on April 28, 2008. Accordingly, we employ the former redemption index under the former fiscal rule as the treatment group. Some of the municipalities that suffered from a previously high redemption index before the introduction might manipulate their accounts within the allowable range of the new fiscal rule.

Therefore, we define as the treatment group any municipality whose former redemption indexes in “FY2006”, which is just before the announcement of the new fiscal rule in FY2007, were higher than 15 %. As mentioned above, the municipalities whose indexes ranged from 15 % to 20 % were called the caution group but were not punished in any way. However, the municipalities whose indexes were higher than 20 % were the limitation group, which included the strict limitation group. These limitation groups had to obtain permission from the central government to issue bonds. Thus, we consider that these criteria were exogenously decided by the central government under the former fiscal rule. For these reasons, we apply the former redemption index as the determiner of the treatment group.

4.2.3 Outcome variables

In this paper, we focus on two categories of outcome variables: the “targeted indexes” and the “untargeted indexes” of the new fiscal rule. The targeted indexes comprise the balance, consolidated balance, redemption, and future burden indexes. The untargeted indexes comprise a fund index and a money transfer index in this paper. In particular, we mainly investigate the following two points.

First, to investigate the stock-flow adjustments within the new fiscal rule, which is one of the methods of creative accounting, we apply the new four fiscal indexes as

the targeted indexes. The new fiscal rule aims to revise the former rule, including improving the fiscal indexes' formulas and the expansion of the coverage of public accounts. Thus, we investigate the fiscal effects not only on whether the new fiscal rule overcomes the problems of the former rules described above but also on whether the municipalities implement the stock-flow adjustments. We consider the following situation in which, for example, even if the municipalities improve the flow indexes, they might worsen the stock index since the future burden index does not entail a red card penalty. Thus, we investigate whether the municipalities implement the stock-flow adjustments under the new fiscal rule.

Second, to investigate the use of creative accounting within legal limitations, which are also so-called legal gray areas, we apply both the fund index and the money transfer index as the untargeted indexes. The fund index is intended for the repayment of bonds for each municipality and is obtained by dividing the total amount of the reserve funds (thousand JPY) by the population size. Although the future burden index includes some amount of the reserve funds, the amount may be insufficient. This situation is because the municipalities can decrease their balance and consolidated their balance indexes by reducing the funds reserved for the repayment of bonds while allowing for an increase in their future burden indexes, which does not entail a red card.

Additionally, we define the money transfer index that represents the money transfers from the ordinary accounts to the public enterprise accounts or others. The money transfer index is obtained by dividing the total amount of the money transfers (thousand JPY) by the population size. This result occurs because some municipalities shifted their fiscal deficits to their own extra-governmental organizations to hide their fiscal deficits under the former fiscal rule. In addition, the money transfers affect the consolidated balance and future burden indexes because if the municipalities increase their money transfers, they can pretend to improve both of those indexes through a consolidated fiscal surplus. Although the numerators of both the redemption and future burden indexes include, to some extent, the estimated amounts of the money transfers from the ordinary accounts to the other accounts, the problems of both regulated and non-regulated enterprises remain important. In particular, non-regulated enterprises are allowed to increase money transfers easily because they are weakly monitored by the central government.

4.2.4 Control variables

The covariates consist of the quadratic function of the population size, the share of the population size under the age of 15; the share of the population size over the age of 65; the merged trends; the dummies of the ordinance-designated cities, core cities, and special-case cities; and the share of the primary and secondary industrial workers among total workers.

The merged trends indicate the passed year after the municipal mergers through the special municipal mergers law in place between FY1999 and FY2005. This result is because the merged municipalities received special treatment including special grants and special bonds after the mergers of 15 years. We, however, exclude the municipalities that chose to merge after FY2007, as mentioned above.

The city size dummy variables consist of an ordinance-designated cities dummy, a core cities dummy, and a special-case cities dummy. Because these cities provide different types of public services depending on their size, we must consider city size

in our estimation. Specifically, the yellow card of the future burden index criterion for ordinance-designated cities is 400 %, while that of other cities is 350 %.

Japan’s municipalities have little right to impose their own local taxes as the system is centralized. Most local tax rates are determined by central government law for obtaining horizontal fiscal equity among the municipalities. The tax capacity of the municipalities depends on their population size or area. Additionally, almost all municipalities depend on a large amount of transfers from the central government. The revenue side of Japan’s municipalities is inflexible and determined. Therefore, we exclude the fiscal covariates.

The interaction terms $X_{iT_0}\tau_t$ are between the year variables and the predetermined covariates of FY2007. The year is the first period in our data. In addition to our covariates, we include the interaction terms between the predetermined area of FY2007 and the year variables, but we exclude the area of the municipalities in our covariates.

4.3 Summary statistics

The summary statistics of FY2007 are reported in Table 1. The numbers of the treatment and control groups are 195 and 1951, respectively. Since we adopt the municipalities whose former redemption index just before the introduction of the new fiscal rule was higher than 15 %, the new fiscal indexes of the treatment group are comparatively worse than those of the control group.

The means of the treatment group between the balance, consolidated balance, redemption, and future burden indexes are 3.155, 9.579, 20.408, and 153.663, respectively. The fund index of the treatment group is approximately 237.936 and higher than that of the control group. This result indicates that the municipalities with high former redemption indexes prepare funds for the repayment of debts in the future. On the other hand, the money transfer index of the treatment group is approximately 76.618 and is higher than that of the control groups. The municipalities with worse fiscal conditions tend to increase their money transfers to the other accounts.

The covariates differ between the treatment and control groups in the pretreatment period. The shares of the population size under the age of 15 and over the age of 65 are statistically significant on simple t-tests. The dummy variables for the designated and special-case cities are statistically significant. The shares of the primary and secondary industrial workers also are different. Additionally, the area between the treatment and control groups is statistically significant. Thus, we suspect that the assignment between the treatment and control groups is non-random and that selection bias affects each group. Thus, we consider not only the covariates but also the interaction terms between the predetermined covariates and the year variables.

Fig. 5 shows the trends in the targeted indexes. We reveal that the trends for all of the four indexes improve after the enforcement of the new fiscal rule. In particular, the balance index of the treatment group clearly increases. The consolidated balance index exhibits a similar tendency. The redemption and future burden indexes improve. In addition, Fig. 6 shows the trends in the untargeted indexes. For the fund indexes, both the treatment and control groups increase. The money transfer indexes of the treatment group rapidly increases, while those of the

control group slightly increases.

5 Empirical results

5.1 Effects on targeted indexes

Table 2 shows the estimation results for the targeted indexes by using the DID method for the period from FY2007 to FY2010. We use some control variables to estimate each index described as the following three patterns: (1) the year fixed effects, (2) the covariates and the year fixed effects and (3) all controls including the interaction terms between the predetermined covariates and the year variables.

As a benchmark, column (1) of the estimation model of each index in Table 2 reports the DID model without any of the covariates. Almost all of the treatment groups are statistically significant in each index except for the redemption index of FY2008. For both the balance and the consolidated balance indexes, the treatment groups each year are significantly positive. The treatment groups of the redemption and the future burden indexes are significantly negative. Column (2) of the estimation model in Table 2 reports the DID model with the year fixed effects and the covariates. These results exhibit a similar tendency as the results of column (1) except for the redemption index of FY2008.

Our main results for the targeted indexes are shown in column (3) for each index in Table 2. For the balance index, the treatment groups each year are statistically significantly positive. The Average Treatment Effects on the Treated (ATTs) of the balance index are 0.63, 0.89, and 1.54 from FY2008 to FY2010. These ATTs are slightly smaller than both columns (1) and (2) because we consider the interaction terms between the predetermined covariates and the year variables. The ordinary accounts of the municipalities improved after the introduction of the new fiscal rule. For the consolidated index, this result exhibits a similar tendency as the balance index results. The treatment groups each year are also statistically significantly positive. The ATTs of the consolidated balance indexes are 1.11, 2.04, and 2.75 from FY2008 to FY2010. These figures are larger than those of the balance indexes each year. The results indicate that the municipalities improve the fiscal conditions of the public enterprises more than they do their ordinary accounts. For the redemption index, the treatment groups of FY2009 and FY2010 are statistically significantly negative. The ATTs of the redemption index are -0.87 and -1.64 in FY2009 and FY2010, respectively. The municipalities with high former redemption indexes improve their redemption indexes, except for the settlement of FY2008, which is just after the introduction of the new fiscal rule. For the future burden index, the treatment variables each year are statistically significantly negative. The ATTs of the future burden index are -6.08, -12.92, and -18.36 from FY2008 to FY2010. The municipalities with high former redemption indexes improve their future burden and the other new fiscal indexes.

As a result, we reveal that the municipalities improve their new fiscal indexes without stock-flow-adjustments after the introduction of the new fiscal rule, and the new fiscal rule is effective for the municipalities. Because the municipalities fully understand that the new fiscal indexes are stricter than the former indexes, they positively implement the improvement of the new fiscal indexes. However, as mentioned above, to investigate the fiscal effects of the new fiscal rule, we should

investigate not only the targeted indexes but also the untargeted indexes including the fund and money transfer indexes.

5.2 Effects on the untargeted indexes

Given these results for the new fiscal indexes, we consider the estimation result of the fund and the money transfer indexes. We show the results of the untargeted indexes in Table 3. Similarly, we show the estimation results for each index from the three patterns: (1) the year fixed effects, (2) the covariates and the year fixed effects, and (3) all controls including the interaction terms between the predetermined covariates and the year variables.

In the column (1) and (2) of Table 3, the treatment groups both the fund and money transfer indexes are positive significant. Additionally, our main results for the untargeted indexes show in column (3). The treatment groups of the fund index are not statistically significant, which are different from the column (1) and (2). Considering the interaction terms between the predetermined covariates and the year variables, the fund index exhibits no differences between the treatment and control groups.

However, the treatment groups of the money transfer index from the ordinary accounts to the public enterprise accounts are statistically significantly positive at standard levels each year. These results should be interpreted with caution because of the creative accounting used between accounts to avoid exceeding the criterion of the new fiscal index relating to the public enterprise accounts. The ATTs of the money transfer index are 3.95, 6.32, and 7.24 from FY2008 to FY2010. Thus, these ATTs are 39, 63 and 72 dollars per capita at the exchange rate of 100 Japanese yen to the United States dollar.

Interestingly, we clearly reveal that the municipalities that suffer from the former redemption index engage in creative accounting to deal with the criterion of the new fiscal index within the new fiscal rule, especially with regard to the public enterprise accounts.

5.3 Robustness checks

In this subsection, we start the robustness and validity checks by using the following three patterns.

5.3.1 Sample of Yubari city

First, we estimate the same model for each index in the sample with Yubari city added. Because Yubari city went fiscally bankrupt in FY2006 under the former fiscal rule and has been under the control of the central government from FY2006 to FY2027, we investigate the fiscal effects of the new fiscal rule for the city with the additional sample. Although the reconstruction plan of Yubari city spreads across two fiscal rules, the most recent period for the reconstruction is under the new fiscal rule.

Table 4 shows the estimation results adding Yubari city. Unlike our main results for the targeted indexes excluding Yubari city, the treatment variable of the balance indexes only in FY2008 is statistically significantly positive. The treatment groups of the consolidated balance indexes in both FY2008 and FY2010 are statistically

significantly positive. For the treatment groups, both the balance and the consolidated balance indexes each year of column (3) in Table 2 are positively estimated with the sample excluding Yubari city, but the results in Table 4 indicate that the new fiscal rule has weak effects on the fiscal surplus. Moreover, for the treatment groups, both the redemption and the future burden indexes exhibit similar results as those in Table 2, and their coefficients are negatively estimated except for the result of the redemption indexes in FY2008.

For the untargeted indexes, the results are quite similar to those shown in Table 2. The treatment groups of the fund indexes each year are statistically insignificant. On the other hand, those of the money transfer indexes are statistically significantly positive. The treatment group clearly increases their money transfers for the public enterprise accounts after the introduction of the new fiscal rule, and those coefficients are nearly the same as the results, excluding Yubari city.

5.3.2 Different thresholds

Second, to check the robustness of the treatment group, we consider other treatment variables by using the different thresholds of the former redemption index. In particular, we consider two treatment cases: the municipalities of the former redemption index higher than 18 % and those higher than 20 %. We do so because the criterion of the new redemption index for the limitation group is 18 %; the municipalities with indexes higher than 18 % under the former rule might react after the new rule. Additionally, since the municipalities with indexes higher than 20 % under the former rule comprise both the limitation and the strict limitation groups, they might react actively after the new rule.

The upper panel in Table 5 shows the results of the treatment group with the former redemption index higher than 18 %. The number of the treatment group is 44 municipalities while that of the control group is 1,732 municipalities. The results are similar to our main results of the targeted indexes shown in Table 2, but the treatment groups for each year of the balance index are larger than those of our main results. Those of the consolidated balance index are larger. The treatment groups of the redemption index are negatively estimated, except for the redemption index in FY2008, and the values are larger than our main results in the absolute value. Similarly, the treatment groups of the future burden index are statistically significantly negative, and those coefficients are larger than our main results in the absolute value. For the fund index, the treatment group in FY2009 is statistically significantly positive. In particular, the treatment groups of the money index are positively estimated, and those coefficients are quite larger than our previous results. The coefficients each year are 8.18, 23.03, and 22.94 JPY per capita (approximately 80, 230, and 229 USD, respectively).

The lower panel in Table 5 shows the results of the treatment group with the former redemption index higher than 20 %. The number of the treatment group is 18 municipalities, while that of the control group is 1,758 municipalities. The treatment groups of the balance index each year are not statistically significant. On the other hand, those of the consolidated balance index are statistically significantly positive, and the coefficients are larger than the previous results. Both the redemption and the future burden indexes yield similar results, but those coefficients are larger than our main results. Thus, the municipalities that were in the limitation groups of bond issuance improved their redemption and future burden

indexes. Additionally, the treatment groups of the fund index are not statistically significant. However, those of the money transfer index are positively estimated, and the coefficients are the largest in our estimation. Although the treatment group improved their targeted indexes, except for the balance index, they clearly increased their money transfers to the public enterprise accounts.

As a result, we reveal that the caution group under the former fiscal rule, when the former redemption index ranged from 15 % to 20 %, implemented creative accounting by increasing the money transfers to improve the targeted indexes.

5.3.3 Placebo treatment period

Third, we formally test for the common trend assumption for our main outcomes of interest using both placebo outcome variables and placebo treatment periods. However, we cannot obtain the new fiscal indexes before the introduction of the new fiscal rule. To check the common trend assumption between the treatment and the control groups in the pretreatment period, we apply the former balance, the fund, and the money transfer indexes as the placebo outcome variables. In particular, that is the reason why the former balance index is almost same as the balance index.

Table 6 reports the estimation results in the placebo treatment periods. To focus the analysis in the placebo treatments, we use only 2 control and 2 treatment period years, which are the data between FY2004 and FY2005. We do so because the number of the municipalities rapidly decreases from approximately 3,200 to 1,820 in the period and we cannot calculate the fiscal indexes. The placebo DID estimation of the former balance, the fund, and the money transfer indexes can statistically confirm the common pre-trend assumption. We can observe that the treatment groups of the former balance, the funds and the money transfer indexes are statistically not significant. Therefore, we reveal that the treatment group increases their money transfers to public enterprises after the introduction of the new fiscal rule while improving their targeted indexes.

6 Discussion

Based on the results from Tables 2 to 6, our main results in Tables 2 and 3 are consistent with the creative accounting implemented under the new fiscal rule. Thus, the treatment group, which faces a large former redemption index, engaged in creative accounting by using money transfers from the ordinary accounts to the public enterprise accounts after the introduction of the new fiscal rule.

One of the purposes of introducing the new fiscal rule was to improve municipal fiscal conditions, including those of extra-governmental organizations. Our results suggest that the new fiscal rule improves the new fiscal indexes without the stock-flow adjustments under the new fiscal rule. On the other hand, we conclude that the treatment group, which suffered from a large redemption index in the former rule, implements creative accounting under the rule by using a combination of the improvement of the targeted indexes and the deterioration of the untargeted indexes. This phenomenon is not an illegal behavior, but it is a postponing behavior of the fiscal improvement to avoid punishments under the new fiscal rule. Thus, to evaluate the new fiscal rule, we should check not only the targeted indexes but also

the untargeted indexes, which indicate the true fiscal conditions.

In Japan's case, we consider that the increase in the money transfers to public enterprises is caused by the difference between regulated and non-regulated enterprises due to the different governance systems. Public enterprises number 9,210 groups in FY2007. The breakdown shows that regulated enterprises number 2,880 groups, but non-regulated enterprises number 6,330 groups in FY2007. Although the consolidated balance and the future burden indexes include some parts of the money transfers to public enterprises, neither their transparency nor their accountability are sufficient.

For example, a part of the future burden index consists of the estimated amount of the money transfers from the ordinary accounts to the public enterprise accounts, but the detailed formula for the estimated amount of the money transfers is not disclosed in the guideline to the formula of the future burden index. The same problems occur in the guideline of the formula of the new fiscal indexes. Additionally, non-regulated enterprises are weakly monitored by the central government. Therefore, in future research, we must obtain more detailed data, including from each public enterprise, to reveal these points.

7 Conclusion

In this paper, we contribute to the literature in several ways. We analyze the use of creative accounting after the introduction of the new fiscal rule in Japan's municipalities. In particular, we focus on the institutional change between the announcement and the enforcement of the new fiscal rule. Our primary contribution is that we identify the causal effects of the new fiscal rule focused on the use of creative accounting by applying the DID method.

We clearly reveal that the municipalities with a large redemption index in the former rule improve these new indexes by increasing money transfers from the ordinary accounts to the public enterprise accounts. This finding occurs because the amount of the money transfers does not have the strict criterion of the new fiscal rule. The municipalities, which had a large former redemption index just before the introduction of the new fiscal rule, manipulate their fiscal indexes through money transfers within the new fiscal rule due to a large amount of accumulated debt in public enterprises. Therefore, we find that the municipalities engage in creative accounting by stock-flow adjustments within the new fiscal rule.

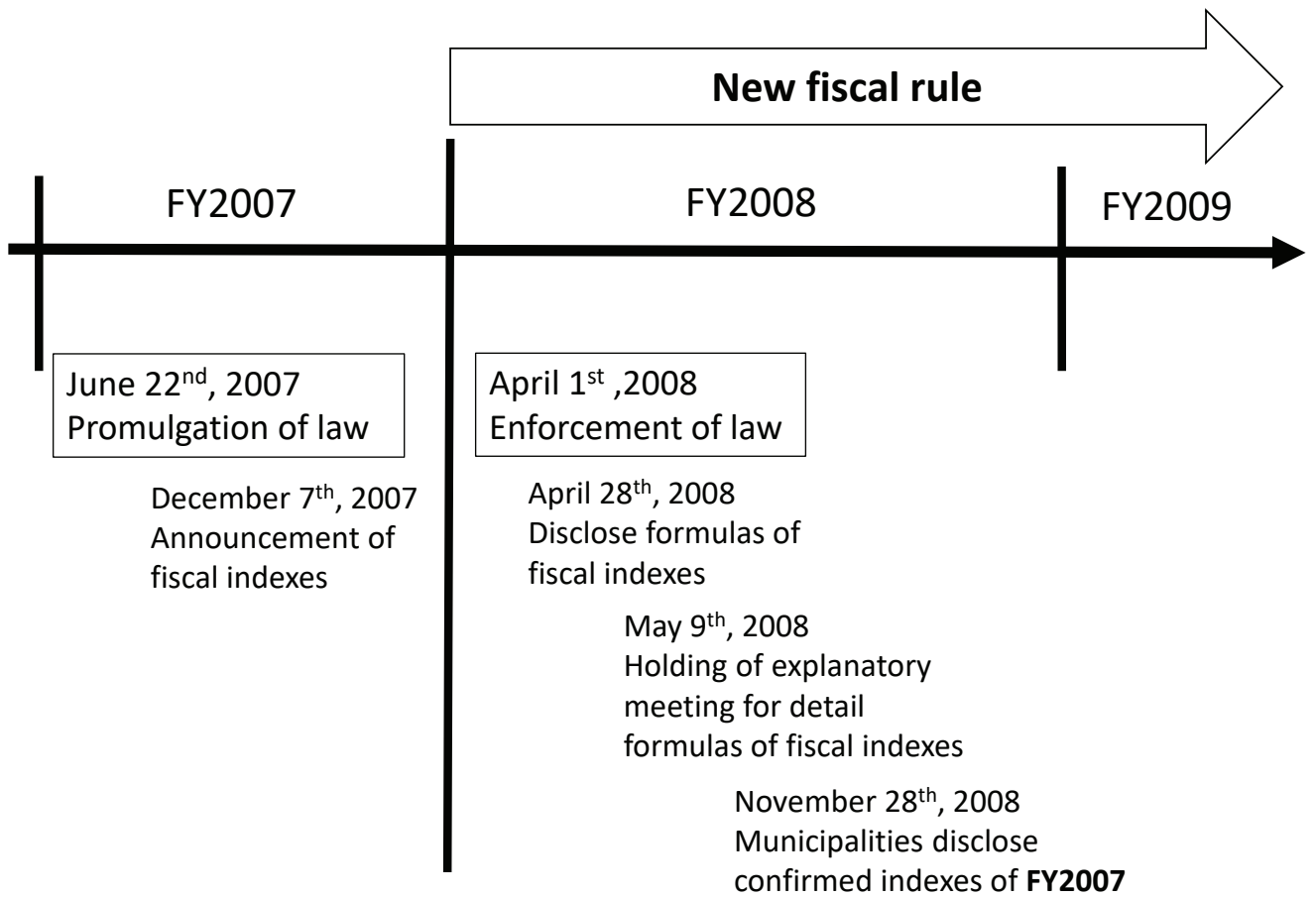
We believe that the municipalities myopically postpone improving their fiscal problems even though the aim of introducing the new fiscal rule is to achieve true fiscal soundness and to prevent creative accounting such as stock-flow adjustments. Given that a number of the municipalities depend on a large number of grants from the central government and that they have a large amount of accumulated debt, we conclude that the municipalities engage in creative accounting by increasing their money transfers. They do so because they do not want to be managed fiscally under the control of the central government. Furthermore, our findings serve as evidence that the municipalities postpone improving their true fiscal conditions.

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Figure 1: Timeline for the introduction of the new fiscal rule



The new fiscal year begins in April in Japan

Figure 2: Target accounts of the indexes for determining the soundness

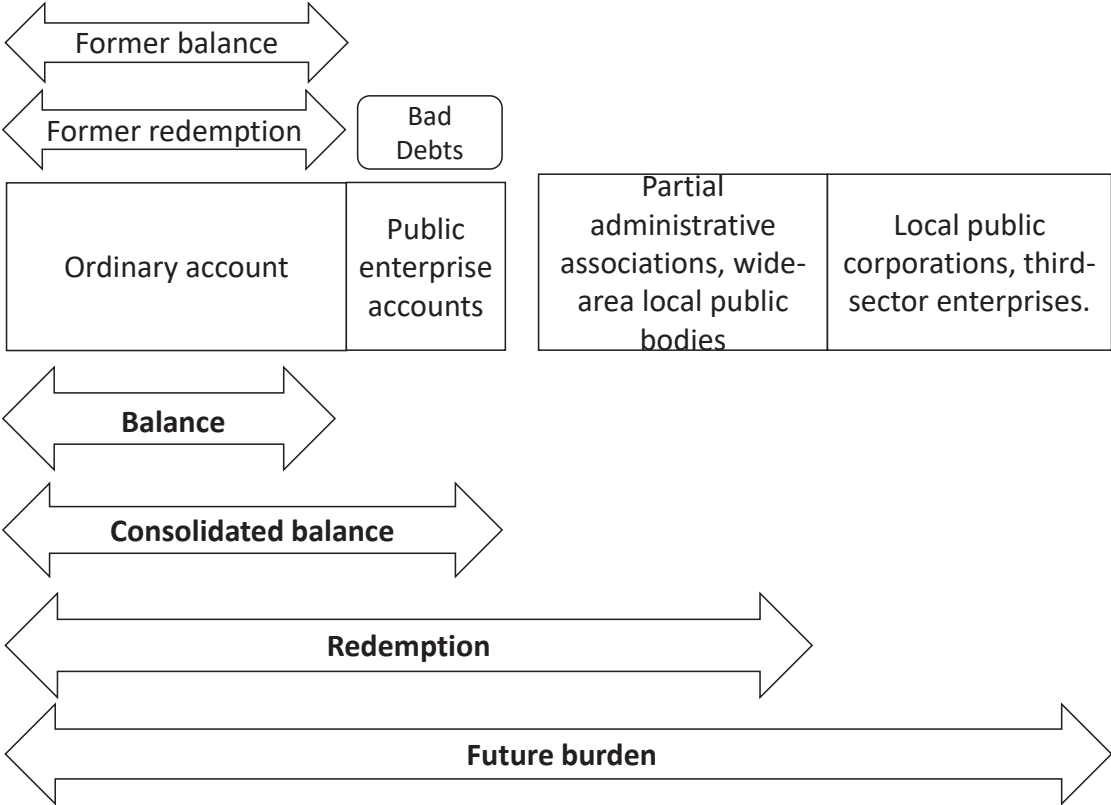
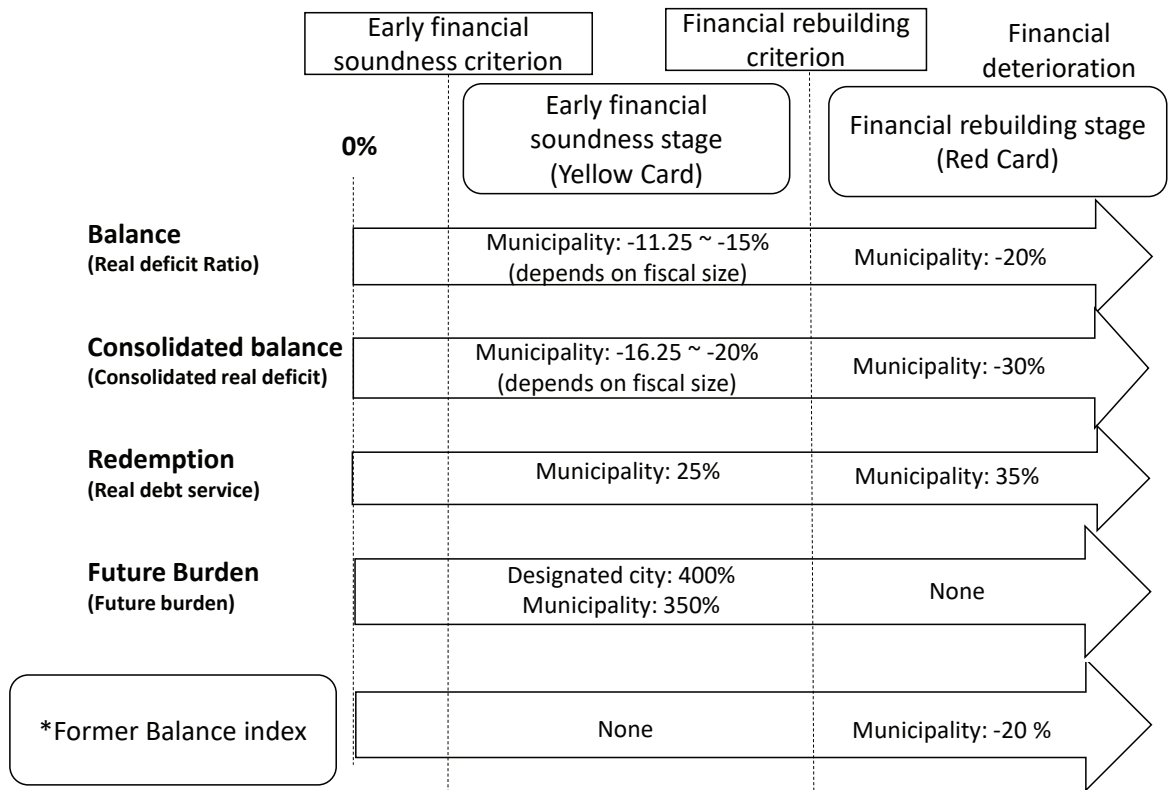
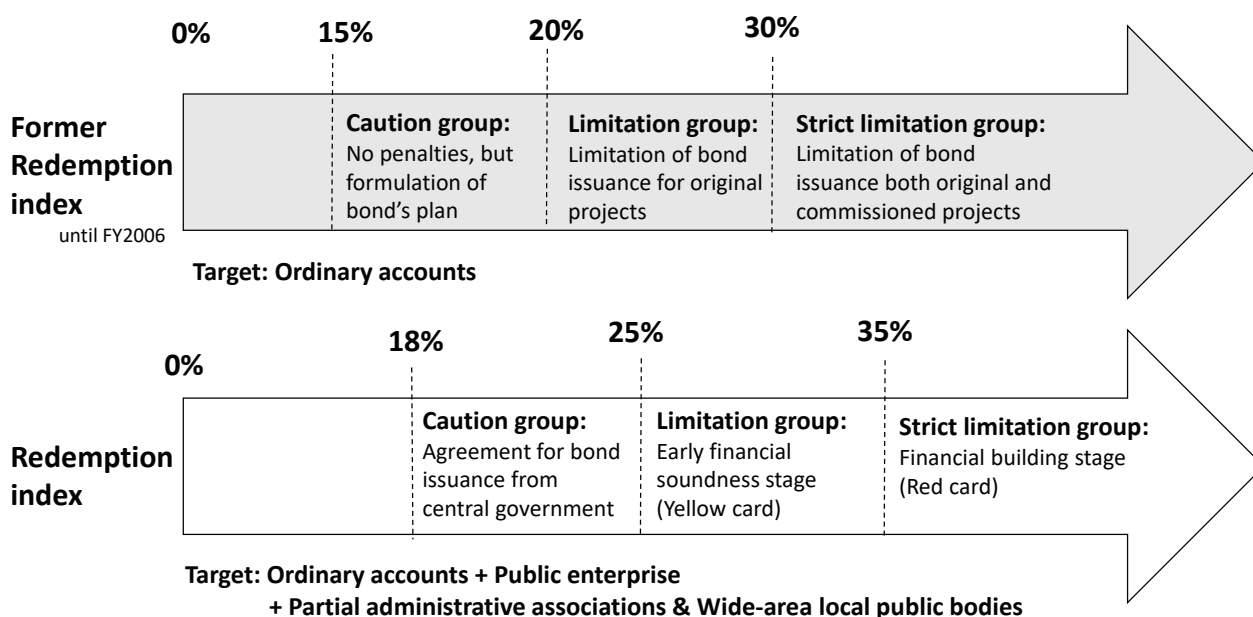


Figure 3: Image of the early financial soundness, the financial rebuilding and the soundness of public enterprise management



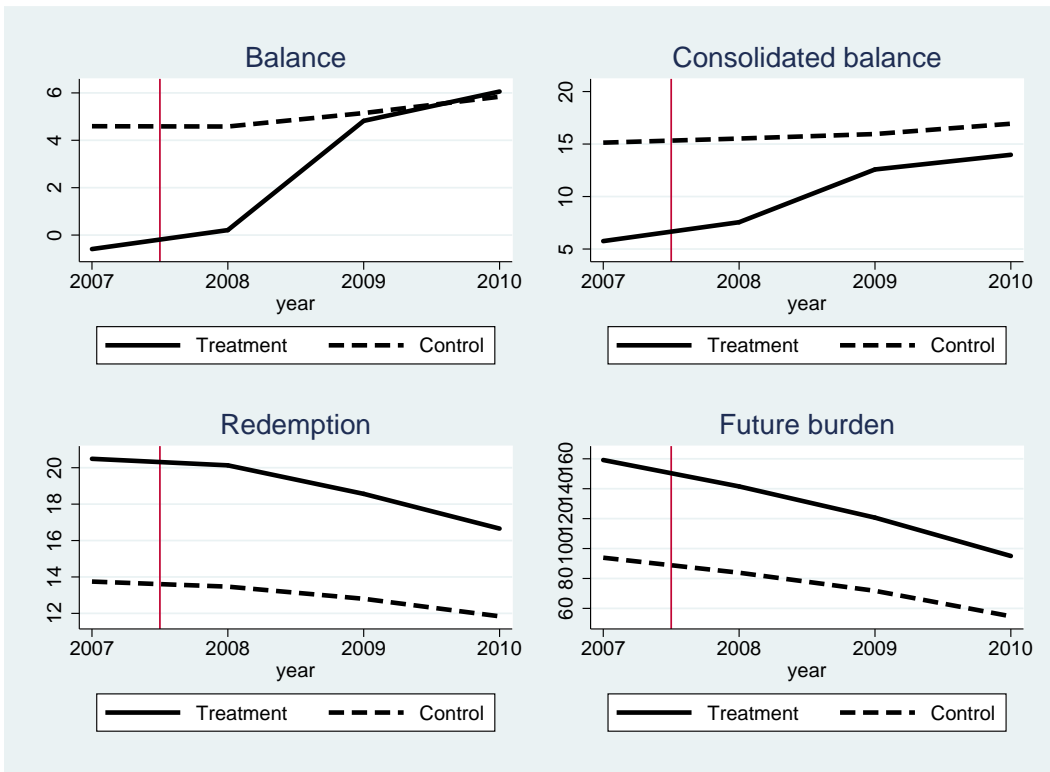
Notes: For the purpose of comparison between the former and the new fiscal rules, the Figure adds the criterion of the former balance index.

Figure 4: Criteria for both the former and new redemption indexes



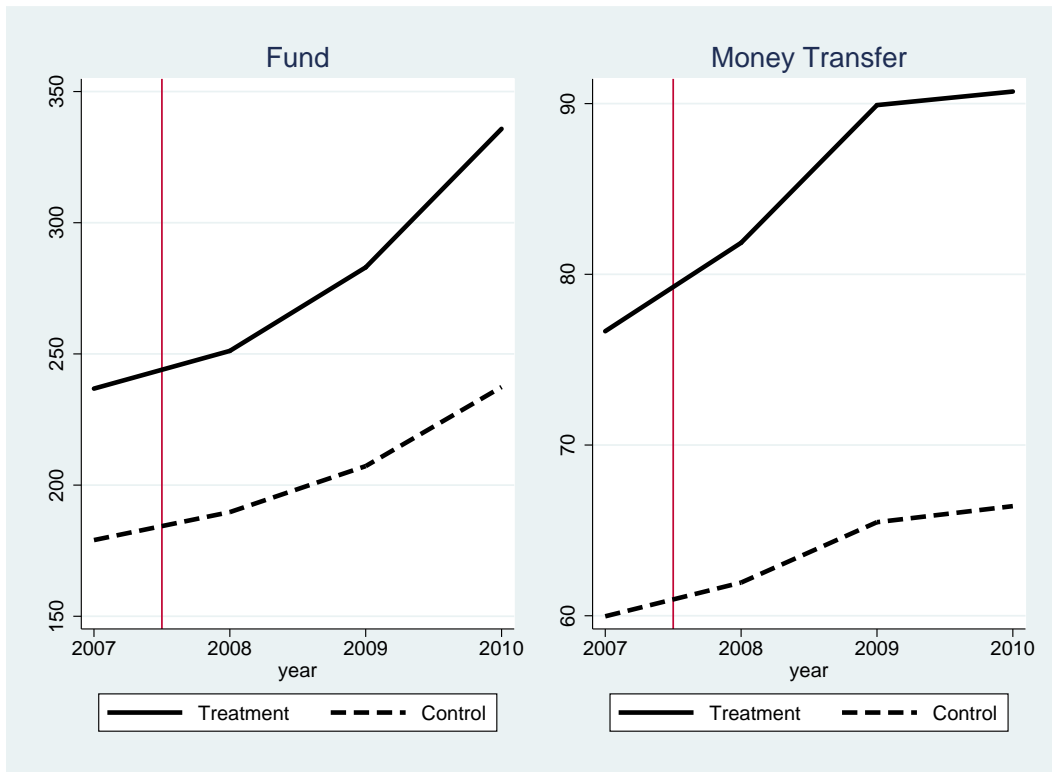
Notes: In the new fiscal rule, the municipalities with the redemption index of 18 % or more require permission to issue local bonds from the Minister of Internal Affairs and Communications. The “strict limitation” group means that the municipalities are prohibited from the bond issuance of both original and commissioned projects by the upper government except for disaster recovery projects.

Figure 5: Trends for the targeted indexes



Notes: The targeted indexes (balance, consolidated balance, redemption, and future burden) are the ratios of the standard financial scale. The untargeted indexes (fund and money transfer) are the per capita expenditure.

Figure 6: Trends for the untargeted indexes



Notes: The targeted indexes (balance, consolidated balance, redemption, and future burden) are the ratios of the standard financial scale. The untargeted indexes (fund and money transfer) are the per capita expenditure.

Table 1: Summary statistics in FY2007

	Control	Treatment	
Number of observations	1581	195	
	Mean	Mean	Mean Diff
Outcome variables			
Balance	4.594	3.155	1.439***
Consolidated balance	15.131	9.579	5.552***
Redemption	13.75	20.408	-6.658***
Future burden	93.928	153.663	-59.735***
Fund (thousand per capita)	179.513	237.936	-58.423**
Money transfer (thousand per capita)	59.993	76.618	-16.624***
Pop. (thousand)	66.098	64.900	1.524
Pop. 15	0.133	0.126	0.008***
Pop. 65	0.256	0.298	-0.042***
Merged trend	1.106	1.133	-0.023
Designated cities	0.008	0.026	-0.018**
Core cities	0.021	0.005	0.016
Special-case cities	0.021	0.000	0.021**
Primary ind.	12.157	16.753	-4.603***
Secondary ind.	28.352	24.807	3.521***
Area	202.674	241.082	-38.408**

Notes: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
The area is used as the predetermined covariates.

Table 2: Estimation results for the targeted indexes

VARIABLES	Balance			Consolidated balance		
	(1)	(2)	(3)	(1)	(2)	(3)
Treatment_2008	0.752*** [0.172]	0.779*** [0.171]	0.627*** [0.171]	1.311*** [0.401]	1.279*** [0.399]	1.111*** [0.397]
Treatment_2009	1.120*** [0.252]	1.110*** [0.250]	0.889*** [0.255]	2.240*** [0.562]	2.233*** [0.556]	2.044*** [0.566]
Treatment_2010	1.663*** [0.352]	1.650*** [0.350]	1.541*** [0.348]	2.660*** [0.699]	2.653*** [0.688]	2.747*** [0.689]
Constant	4.400*** [0.039]	-4.417 [5.286]	9.449 [10.649]	14.485*** [0.089]	17.323 [24.242]	61.180* [32.636]
Observations	6,880	6,880	6,880	6,880	6,880	6,880
R-squared	0.134	0.139	0.150	0.084	0.093	0.110
Number of code	1,776	1,776	1,776	1,776	1,776	1,776
Covariates	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Covariates \times Year	No	No	Yes	No	No	Yes

VARIABLES	Redemption			Future burden		
	(1)	(2)	(3)	(1)	(2)	(3)
Treatment_2008	-0.115 [0.075]	-0.248*** [0.081]	-0.071 [0.076]	-7.452*** [1.389]	-8.907*** [1.467]	-6.080*** [1.375]
Treatment_2009	-1.060*** [0.131]	-1.054*** [0.131]	-0.869*** [0.125]	-17.500*** [2.009]	-17.260*** [1.999]	-12.916*** [1.912]
Treatment_2010	-2.039*** [0.215]	-2.026*** [0.214]	-1.638*** [0.200]	-25.410*** [2.616]	-25.052*** [2.594]	-18.357*** [2.466]
Constant	14.490*** [0.026]	11.431*** [4.277]	8.618 [8.329]	100.649*** [0.435]	444.613*** [129.996]	432.199** [169.877]
Observations	6,880	6,880	6,880	6,880	6,880	6,880
R-squared	0.454	0.464	0.511	0.548	0.555	0.595
Number of code	1,776	1,776	1,776	1,776	1,776	1,776
Covariates	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Covariates \times Year	No	No	Yes	No	No	Yes

Notes: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All models control for the covariates, the time-invariant fixed effects of the municipalities, the year fixed effects, and the interaction term between the predetermined covariates and the year fixed effects.

Table 3: Estimation results for the untargeted indexes

VARIABLES	Fund			Money transfer		
	(1)	(2)	(3)	(1)	(2)	(3)
Treatment_2008	7.550** [3.084]	15.224*** [3.817]	-0.956 [3.230]	4.306*** [1.452]	4.877*** [1.403]	3.947** [1.643]
Treatment_2009	25.968*** [7.280]	24.934*** [7.304]	3.235 [6.678]	8.509*** [1.932]	8.637*** [1.999]	6.322*** [2.110]
Treatment_2010	48.257*** [11.278]	46.719*** [11.258]	6.529 [9.794]	8.867*** [1.939]	9.002*** [2.045]	7.235*** [2.293]
Constant	188.109*** [1.343]	-19.241 [171.607]	-223.356 [590.877]	62.140*** [0.426]	-197.200*** [40.720]	22.833 [276.109]
Observations	6,880	6,880	6,880	6,880	6,880	6,880
R-squared	0.163	0.187	0.358	0.046	0.053	0.080
Number of code	1,776	1,776	1,776	1,776	1,776	1,776
Covariates	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Covariates \times Year	No	No	Yes	No	No	Yes

Notes: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All models control for the covariates, the time-invariant fixed effects of the municipalities, the year fixed effects, and the interaction term between the predetermined covariates and the year fixed effects.

Table 4: Sample of Yubari city

VARIABLES	Sample with Yubari city					
	Balance	Consolidated balance	Redemption	Future burden	Fund	Money transfer
Treatment_2008	0.772*** [0.231]	1.274*** [0.432]	-0.042 [0.081]	-6.329*** [1.392]	-1.139 [3.232]	3.901** [1.644]
Treatment_2009	4.372 [3.471]	5.567 [3.545]	-0.856*** [0.125]	-13.379*** [1.959]	2.855 [6.672]	6.673*** [2.131]
Treatment_2010	5.066 [3.518]	6.312* [3.606]	-1.586*** [0.205]	-19.490*** [2.703]	6.227 [9.758]	7.144*** [2.282]
Constant	81.044 [72.883]	133.676* [80.813]	9.350 [8.356]	417.247** [170.243]	-231.691 [590.136]	26.692 [275.678]
Observations	6,884	6,884	6,884	6,884	6,884	6,884
R-squared	0.026	0.033	0.506	0.592	0.358	0.081
Number of code	1,777	1,777	1,777	1,777	1,777	1,777
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Covariates \times Year	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All models control for the covariates, the time-invariant fixed effects of the municipalities, the year fixed effects, and the interaction term between the predetermined covariates and the year fixed effects.

Table 5: Robustness checks with different treatments

The former redemption index higher than 18 %						
VARIABLES	Balance	Consolidated balance	Redemption	Future burden	Fund	Money transfer
Treatment_2008	1.328*** [0.413]	3.026** [1.324]	0.045 [0.240]	-9.191** [3.739]	9.506 [8.734]	8.184** [3.315]
Treatment_2009	1.367** [0.546]	5.277*** [1.767]	-1.115*** [0.384]	-20.296*** [5.046]	37.403* [20.878]	23.026*** [6.421]
Treatment_2010	2.089** [0.839]	6.869*** [2.000]	-2.049*** [0.608]	-25.759*** [6.312]	40.938 [28.482]	22.943*** [6.344]
Constant	5.810 [10.629]	55.032* [32.653]	11.719 [8.438]	477.098*** [170.555]	-223.604 [589.702]	5.288 [273.185]
Observations	6,880	6,880	6,880	6,880	6,880	6,880
R-squared	0.145	0.117	0.496	0.590	0.360	0.088
Number of code	1,776	1,776	1,776	1,776	1,776	1,776
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Covariates \times Year	Yes	Yes	Yes	Yes	Yes	Yes

The former redemption index higher than 20 %						
VARIABLES	Balance	Consolidated balance	Redemption	Future burden	Fund	Money transfer
Treatment_2008	1.035 [0.636]	2.644** [1.139]	-0.090 [0.389]	-18.017*** [5.315]	9.959 [16.262]	12.426** [5.876]
Treatment_2009	1.374 [0.941]	6.575** [2.699]	-1.392* [0.761]	-32.334*** [8.671]	62.895 [43.334]	31.622*** [11.645]
Treatment_2010	1.797 [1.341]	8.328*** [2.761]	-2.633** [1.223]	-39.635*** [11.801]	63.224 [59.121]	28.096*** [8.263]
Constant	5.163 [10.758]	53.013 [32.576]	12.225 [8.336]	484.192*** [170.508]	-235.928 [587.769]	-1.834 [273.338]
Observations	6,880	6,880	6,880	6,880	6,880	6,880
R-squared	0.142	0.111	0.492	0.590	0.360	0.084
Number of code	1,776	1,776	1,776	1,776	1,776	1,776
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Covariates \times Year	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All models control for the covariates, the time-invariant fixed effects of the municipalities, the year fixed effects, and the interaction term between the predetermined covariates and the year fixed effects.

Table 6: Placebo tests

VARIABLES	Former balance	Fund	Money transfer
Placebo treatment	-0.029 [0.189]	-0.925 [4.655]	0.511 [1.657]
Constant	4.061 [4.165]	313.988*** [81.869]	94.930** [38.257]
Observations	3250	3259	3258
R-squared	0.026	0.024	0.068
Number of code	1779	1779	1779
Covariates	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Covariates \times Year	Yes	Yes	Yes

Notes: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All models control for the covariates, the time-invariant fixed effects of the municipalities, the year fixed effects, and the interaction term between the predetermined covariates and the year fixed effects.

A Outline of the new fiscal indexes

- Deficit index (Balance index in this paper)

$$Deficit = \frac{Real\ deficit\ of\ ordinary\ accounts}{Standard\ financial\ scale}$$

- Real deficit of the ordinary accounts: Amount of real deficit in account corresponding to ordinary account among the general and special accounts
 - * Amount of real deficit = amount of advanced appropriation + (amount of deferred payment + amount of business balance carried forward)

- Consolidated deficit index (Consolidated balance index in this paper)

$$Consolidated\ deficit = \frac{Consolidated\ real\ deficit}{Standard\ financial\ scale}$$

- Consolidated real deficit: If the total amount of 1 and 2 exceeds the total amount of 3 and 4, such exceeding amount
 - * 1. Among the general and special accounts excluding public enterprises (enterprises regulated and enterprises not regulated by the Local Public Enterprise Law), the total amount of real deficit of the accounts subject to real deficit
 - * 2. Among the special accounts of public enterprises, the total amount of deficit of funds of the accounts subject to deficit of funds
 - * 3. Among the general and special accounts excluding public enterprises, the total amount of real balance surplus of the accounts subject to real balance surplus
 - * 4. Among the special accounts of public enterprises, the total amount of surplus of funds of the accounts subject to surplus of funds

- Redemption index

$$Redemption = \frac{(A + B) - (C + D)}{Standard\ financial\ scale - D}$$

- A: Redemption of principal and interest of bonds
 - B: Quasi-redemption of principal and interest
- B is the total amount of 1 to 5

- * 1: Amount corresponding to the annual redemption of principal in a case of principal equal amortization where the redemption period is 30 years regarding bullet bonds
- * 2: Among the transfers from the general accounts, etc. to the special accounts other than the general accounts, etc., the amount acknowledged to be appropriated for revenue resources for the redemption of public enterprises bonds
- * 3: Among the burdens and subsidies to associations/local development corporation, the amount acknowledged to be appropriated for revenue resources for the redemption of bonds issued by the associations, etc.

- * 4: Expenditure based on liabilities that can be treated similarly to debt service among the expenditure based on the debt burden
- * 5: Interest on a temporary loan
- C: Special revenue resources
- D: Amount included in the standard financial requirements pertaining to the redemption of principal and interest and the quasi-redemption of principal and interest

- Future burden index

$$Future\ burden = \frac{Future\ burden - (A + B + C)}{Standard\ financial\ scale - D}$$

- Future burden: Total amount of 1 to 8
 - * 1: Outstanding bonds as of the end of the fiscal year previous to the relevant fiscal year of the general accounts, etc.
 - * 2: Expected amount of expenditure based on the debt burden (those pertaining to the expenses of each item under Article 5 of the Local Finance Law)
 - * 3: Estimated amount of the transfer from the general accounts, etc., to be appropriated to the redemption of the principal of bonds of the accounts other than the general accounts, etc.
 - * 4: Estimated amount of the burden, etc., of the local government concerned to be appropriated for the redemption of the principal bonds of the associations, etc., of which the local government concerned is a number
 - * 5: Among the expected amount of the retirement allowance to be paid (amount of the allowance that will be paid to all employees at the term end), the estimated amount of the burden of the general accounts, etc.
 - * 6: Among the amount of debts of certain corporations established by the local government and among the amount of the debt burden in the case of bearing the debts for such certain corporations, the estimated amount of the burden of the general accounts, etc., considering the financial and business condition of such corporations, etc.
 - * 7: Consolidated real deficit
 - * 8: Among the amount corresponding to the consolidated real deficit of the associations, etc., the estimated amount of the burden of the general accounts, etc.
- A: Amount of appropriable funds
 - * Funds under Article 241 of the Local Autonomy Law that can be appropriated for the amount of redemption, etc., of 1 to 6
- B: Estimated amount of special revenue sources
- C: Amount expected to be included in standard financial requirements pertaining to outstanding local government bonds, etc.
- D: Amount included in standard financial requirements pertaining to the redemption of principal and interest and the quasi-redemption of principal and interest