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Do public account financial statements matter? Evidence from Japanese municipalities☆

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ABSTRACT

Many governments are introducing business-like accounting systems. This paper examines the fiscal effects of compiling business-like financial statements on the expenditures of local governments in Japan as a complement to cash-based reporting. Using the variation in the deadlines for compiling new statements given by the central government in a difference-in-differences instrumental variable approach, we found that business-like financial statements have limited effects on municipalities' expenditures but have short-run effects on social assistance expenses. This might be a part of the reconstruction of their expenditure structure.

1. Introduction

Traditionally, public-sector budgets have been prepared and settlements have been reported through cash-based accounting. Cash-based accounting statements generally do not report assets and liabilities, while business-like accrual-based accounting statements do report them. Cash-based accounting recognizes transactions only when the associated cash is received or paid, while accrual-based accounting recognizes transactions when they occur. Therefore, a reform from cash-based to accrual-based accounting can provide relatively comprehensive and long-term insights into the impacts of such a policy. This paper investigates the fiscal effects of compiling business-like financial statements in addition to traditional cash-based settlement documents by exploiting a change for Japanese subnational governments, using the variation in the deadlines set by the central government.

Following the arguments favorable to accrual accounting, in 2016, approximately three-quarters (25 out of 34) of the central governments of countries in the Organization for Economic Cooperation and Development (OECD) had adopted an accrual accounting basis for annual financial reports, and approximately 30% of these countries (10 out of 34) had done so for budget preparation (Moretti, 2016). The financial statements of subnational governments are also becoming accrual-based. An OECD survey showed that two-thirds (21 out of 32) of OECD countries use accrual-based accounting for the statements of subnational governments (Irwin and Moretti, 2020). The central government of Japan, similar to those of other developed countries, has compiled balance sheets since 2000; however, they are complementary to cash-based fiscal reports (Moretti and Youngberry, 2018). Local governments are also asked to compile balance sheets and other related financial statements.

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Despite the widespread use of business-like accounting systems, the empirical evidence regarding such a system's effects is insufficient. The accounting literature is mainly based on case studies or questionnaires that examine the effects of accrual accounting.[1] Some scholars have questioned the usefulness of business-like accounting per se: Carlin (2005) for the State of Victoria, Australia; Paulsson (2006) for the Swedish central government; and Kobayashi et al. (2016) and Kuroki et al. (2022) for Japanese local governments,[2] among others. As Christensen (2007) summarizes, one of the challenges faced in measuring the effects of accrual accounting is that accounting reforms are often interconnected with organizational and managerial changes.

In examining the effects of an accounting system, it is insufficient to compare local governments with different accounting systems because a local government that wants to improve its fiscal balance or restructure its budget may well choose business-like accounting.[3] To address this endogeneity, Christofzik (2019) uses the variation in the timing with which regulation for accounting is enacted among German states, and Dorn et al. (2021) use the variation in the timing of the introduction of accrual-based statements among counties in Bavaria, Germany. Both studies depend on the assumption that decisions regarding public accounting systems are random once observable variables, government- and time-specific effects and time trends are controlled for. A more recent paper by Raffer (2020) applies a quasi-experimental approach with different matching techniques to data from municipalities in the German state of Baden-Württemberg.

Regarding the choice of accounting standard as an intuition or a rule, this paper contributes to the literature on fiscal discipline. When fiscal deficits tend to be excessive (e.g., Alesina et al., 1998; Persson and Tabellini, 2000), numerical fiscal rules such as balanced budget rules are promising tools for fiscal discipline.[4] The literature supports the effectiveness of fiscal rules for federal- and state-level governments (e.g., Poterba, 1994; Eichengreen and Bayoumi, 1994; von Hagen and Harden, 1995; Debrun et al., 2008). Negative effects of such rules, such as avoidance behaviors and creative accounting, have also been noted (e.g., Milesi-Ferretti, 2004; von Hagen and Wolff, 2006; Beetsma et al., 2009). Moreover, the effects of fiscal rules on local governments have been studied. Positive effects have been found in some studies, including those by Grembi et al. (2016) for Italian municipalities, by Dove (2016) for U.S. municipalities, and by Burret and Feld (2018b) and Chatagny (2015) for Swiss cantons, although avoidance behavior has also been detected by Balduzzi and Grembi (2011) for Italian municipalities, by Burret and Feld (2018a) for Swiss cantons, and by Hirota and Yunoue (2022) for Japanese municipalities. This literature shows that not only numerical rules but also fiscal institutions can play a role in fiscal health; this is the case with independent fiscal agencies and councils (Debrun et al., 2009) and systems of fiscal oversight and enforcement (Christofzik and Kessing, 2018), transparency (Alt and Lassen, 2006; Benito and Bastida, 2009), or fiscal information (Janků and Libich, 2019). As discussed by Dorn et al. (2021), accounting standards are a component of fiscal institutions and thus can affect governments' behavior.

The purpose of this paper is to examine the fiscal effect of compiling new business-like financial statements in addition to traditional cash-based settlement documents as supplementary information. Our data are taken from Japanese local governments, and they provide us with an environment in which to measure the causal effects of this new accounting system.[5] As mentioned above, in 2007, the Japanese central government asked local governments to compile new financial statements. It also set deadlines for compiling these statements, although following this request was not mandatory, as explained in the next section. The deadline given to each local government depended only on the type of local government and the population size; thus, the deadlines were not controllable by or endogenous to local governments. Our identification strategy exploits the variation in the timing of the deadlines in an instrumental variable approach to address the possible endogeneity in the compilation of the new financial statements, which might not be fully controlled for in Christofzik (2019) or Dorn et al. (2021).[6] After the new statements were introduced, the traditional settlement documents continued to be published officially as the main documents in our setting, which enabled us to use comparable data before and after the introduction of the new statements. We applied a difference-in-differences with instrumental variables (DID-IV) approach, focusing on primary expenditures and each category of expenditure.

Our findings are summarized as follows. First, the new financial statements do not affect the primary expenditures of ordinary accounts. This is consistent with the results of Christofzik (2019) and Dorn et al. (2021), who find only a limited impact on the overall financial balance or expenditures. Second, the new statements negatively affect social assistance expenses. This result is robust across specifications, but it is only a short-run effect. Third, the new statements increase "other revenue", most of which is revenue from the principal and interest of loans to others. Fourth, the effects of the different coverage of the new financial statements do not vary substantially.

These findings do not necessarily coincide with the technical-rational view that accrual accounting provides more comprehensive information than cash-based accounting and thereby improves transparency, efficiency and accountability. This may be due to short-run implementation costs that mask such advantages. As Dorn et al. (2021) point out, cash-based accounting may already provide sufficient information, and political decision makers may lack sufficient skill to use the information provided by the new financial statements. It is also possible that accrual accounting requires estimates and is thus not necessarily transparent, as Christofzik (2019)

[1] As Kobayashi et al. (2016) argue, many studies have focused on the implementation of accrual accounting in the public sector.

[2] The effects can be heterogeneous among public workers depending on their positions or experience (e.g., Kober et al., 2010; Yamamoto, 1999).

[3] Heinemann et al. (2018) also point out a bias due to the potential endogeneity of fiscal rules.

[4] Financial markets can discipline governments by raising the interest rates for public debt if sustainability is questioned (e.g., Ardagna, 2009). The reelection motive may function if politicians want support from fiscally conservative voters or if a fiscal surplus works as a signal (Konishi, 2006).

[5] Kondo and Ogawa (2019) use the same data source but do not examine the environment that we focus on.

[6] Christofzik (2019) uses the variation in the implementation of accrual accounting across states, and the municipal data are aggregated at the state level. Dorn et al. (2021) use data on counties in a single state (Bavaria), where counties can choose between cash-based and accrual accounting. These two studies use the fixed effects panel model and might not be immune to bias due to omitted variables or reverse causality.

argues. Our interpretation is that the new financial statements have symbolic value rather than decision-making value, and they trigger the reconstruction of local governments' expenditures on items as part of the administrative reform.

The rest of this paper is organized as follows. Section 2 introduces the institutional background of the study and the data utilized. The econometric specifications are described in Section 3, and the estimation results are reported and discussed in Section 4. Section 5 concludes the paper.

2. Background and data

2.1. Institutional background

2.1.1. Local administrative system of Japan

In this subsection, we briefly explain the local government system of Japan and the rules of the Japanese public accounting system. Japan's administrative system has three layers, namely, central, prefectural, and municipal governments, from top to bottom (see, for example, Bessho, 2016 for more detail). There were 1822 municipalities at the end of FY2007, and these municipalities were divided into 783 cities (*shi*), 815 towns (*machi*), 201 villages (*mura*) and 23 Tokyo metropolitan special wards (*ku*).

In principle, cities have larger populations than towns, which, in turn, have larger populations than villages. Although some large cities have more authority transferred from the central government than towns and villages do, these three types of municipalities mostly share the same level of authority, and the major difference lies in their population size. Tokyo metropolitan special wards differ from other municipalities in relation to their authority on taxes and expenditures and their relation to the next level of government, the Tokyo Metropolitan government. For this reason, we exclude these wards from our sample below.

Municipalities play an important role in providing many public services and have major fiscal responsibilities. The share of final consumption expenditure and gross fixed capital formation associated with local governments, based on national account statistics, is larger than that of the central government. For example, local expenditure as a percentage of GDP was approximately 11.2 percent in FY2007, while the corresponding figure for the central government was approximately 4 percent.

However, the tax revenues of the central government are higher than those of local governments. This means that the expenditures of local governments exceed their tax revenues; that is, there is a large vertical fiscal gap. This gap is filled by intergovernmental transfers.

2.1.2. Before the reform in 2007

The public accounting systems of Japanese local governments have traditionally been cash-based systems, and the same is true of the central government (Kobayashi et al., 2016; Moretti and Youngberry, 2018). Some local governments, however, have published tentative versions of their statements of financial position on an accrual basis since the 1980s; these include the governments of Hirakata City in 1982 and Kumamoto Prefecture in 1987 (Matsumoto, 2019).

After the bubble burst in the financial market in the early 1990s, both central and local governments began to accumulate public debt more rapidly than before. Some critics, including Shintaro Ishihara, who was at this time the Tokyo metropolitan governor, insisted that an accrual-based, double-entry public accounting system was necessary for a more efficient public sector. In 1999, the Strategic Economic Council, an advisory body to the Prime Minister, proposed the introduction of accrual-based factors to public accounting. In response to this proposal, the Ministry of Internal Affairs and Communications (MIC) established a group to research an accrual-based accounting system, and this group published reports in 2000 and 2001. These reports presented a method for compiling a statement of financial position (balance sheet, or *Taishaku Taisho Hyo*) and a statement of financial performance (*Gyousei cost Keisan Sho*). This method is now called the former MIC method. At this point, local governments were not required to compile these fiscal statements, which were supplementary to their cash-based settlement documents.

The Koizumi administration defined the Important Policies for Administrative Reform in 2005. Following these policies, the MIC published another report in 2006 on the public accounting system that summarized the purposes of compiling the new financial statements as follows: (1) asset and debt management; (2) cost management; (3) easily understandable fiscal disclosures; (4) improved policy evaluation, budget preparation and settlement analysis; and (5) improved fiscal discussion in local councils. Asset and debt management were listed first because the depreciation of local governments' public facilities was a critical issue. Japanese local governments manage public facilities, including water supplies and sewage systems, roads, bridges, and school buildings, most of which are not available for sale. Thus, as these facilities depreciate, local governments must expend funds to maintain or renew them. Under a traditional cash-based accounting system, however, many local governments might not properly recognize these maintenance and renewal costs.[7] Since these costs were projected to increase soon, the MIC, as a part of the central government, decided to encourage proper asset evaluation by introducing an accrual-based accounting system. For this purpose, the new MIC report in 2006 proposed two methods for compiling financial statements. One is "the standard method", which is fully accrual-based, similar to corporate accounting, and requires double-entry bookkeeping and a registry of fixed assets. The other method is called "the revised MIC method" and relies on cash accounting and single-entry bookkeeping. The revised MIC method made a minor modification to the former MIC method and was positioned as an intermediate version of the standard method (Kobayashi et al., 2016).

[7] Local governments were assumed to maintain lists of all facilities, but the lists of some local governments did not include information on the value of these facilities. Furthermore, the lists were compiled by category, such as roads or buildings, but did not necessarily include all categories.

2.1.3. Reform in 2007

The MIC, a ministry of the central government, issued an official notice on October 27, 2007 that asked the local governments[8] to prepare the following four financial statements: a statement of financial position (balance sheet or *Taishaku Taisho Hyo*); a statement of financial performance (*Gyousei cost Keisan Sho*); a statement of changes in net assets/equity (*Jyunshisan Hendo Keisan Sho*); and a cash flow statement (*Shikin Shushi Keisan Sho*). The revised MIC method or the standard method was supposed to be adopted for this task. Note that this did not involve the replacement of cash-based fiscal statements with accrual-based statements; rather, the MIC asked these local governments to prepare new financial statements in addition to the existing cash-based settlement documents as a supplement. The statements were for annual financial reports, not for budget preparation.

Note that two different deadlines were set depending on the type and population size of each local government. The deadline for prefectures and cities with a population greater than 30,000 was FY2010, while that for cities with populations smaller than 30,000 and for towns and villages was FY2012. More specifically, prefectures and cities with population sizes greater than 30,000 were required to compile the new financial statements for the FY2008 settlement by the end of FY2010, while the others were required to compile them for the FY2010 settlement by the end of FY2012. As explained above, cities generally have larger populations than towns and villages. Thus, this notice meant that small municipalities faced less time pressure than large municipalities.

The notice that the MIC officially issued in 2007 did not specify any penalties for local governments if they failed to compile all four of the new financial statements by the deadline. Therefore, one may question whether this notice enforced the compilation of financial statements by local governments. We believe that this notice was effective because of the intertwined nature of the central-local relationship in Japan (Bessho, 2016). As presented below, many local governments met the deadline. Thus, this paper focuses on the variation in deadlines based on population size to identify the fiscal effects of the introduction of the new financial statements.

As noted above, the central government defined policies for administrative reform in 2005, including the implementation of the Local Fiscal Consolidation Law. Moreover, it promoted the Second Decentralization Reform on a nationwide basis in 2007. The threshold population size of 30,000 was not used in any of these reform packages except the accounting package. In this sense, the threshold of 30,000 residents seems arbitrary when compared to the other policies of the central government. For example, when the MIC compares the financial situations of municipalities by population size in the annual White Papers on Local Public Finance, the thresholds it uses are 100,000 for cities and 10,000 for towns and villages.[9]

2.1.4. Accounts of local governments

To manage the flow of funds, local government accounts are usually divided into a general account and special accounts. A national law stipulates that a local government must separate its accounts and set up special accounts for some types of public services. Moreover, local governments have the authority to separate accounts used for other administrative work and projects at will. As a result, local governments have different types of special accounts depending on their environmental or social conditions. To compare fiscal situations, the central government created the concept of an ordinary account, whose coverage is common to all local governments. This ordinary account includes a general account and some special accounts. We use the statistics of ordinary accounts in this paper.

When asking local governments to prepare new financial statements in 2007, the MIC asked these governments to prepare statements covering three different sets of accounts to comprehensively disclose their local fiscal situations and to make the accounts comparable.

The first set of accounts is covered by "ordinary financial statements", or *Futu Zaimu Shorui*, which are hereafter referred to as "FSs". FSs cover the ordinary accounts explained above. The second set is covered by "consolidated financial statements", or *Zentai Zaimu Shorui*, which are referred to as "CFSs" hereafter. CFSs cover both ordinary accounts and select public enterprise accounts. The third set is covered by "government-wide financial statements" or *Renketsu Zaimu Shorui*, which are hereafter referred to as "GFSs". GFSs cover ordinary accounts and special accounts for other extragovernmental organizations, such as public corporations and "third-sector" enterprises.[10]

Accordingly, local governments were expected to prepare four financial statements (a statement of financial position, statement of financial performance, statement of changes in net assets/equity, and cash flow statement) for each area of coverage by the deadline. That is, they were required to prepare 12 financial statements.

2.2. Data and summary statistics

2.2.1. Data

The panel data used in this paper were mainly constructed with the Survey on Local Public Finance Situations (*Chiho Zaisei Jyokyo Chousa*) and the Survey on the Situation of Compiling Financial Statements by Local Governments (*Chiho Kokyo Dantai no Zaimu Shorui Sakusei Jyokyo*). The latter has been available since fiscal year 2005. Both surveys were conducted by the MIC. The

[8] The notice was issued to prefectural governors and the mayors of selected large cities. The receiving governors were asked to communicate the notice to the municipalities within their prefectures. This means that mayors were responsible for this task.

[9] One exception is the threshold for the population size needed to progress to a "city" from a "town" in the 2000s. The central government lowered the threshold to 30,000 from the original 50,000 to promote municipal mergers. Municipal-specific trends are included in the estimation equation to control for the effect of this provision.

[10] "Third-sector" enterprises are corporations jointly funded by the local government and private organizations.

former includes information on the settlements of the ordinary accounts of municipalities, and the latter includes information on the introduction of financial statements by municipalities. Other data sources include the Survey on the Basic Register of Residents (*Jyumin Kihon Daichou Chosa*) and the Population Census (*Kokusei Chousa*).

Sample selection We use data on the new financial statements for fiscal years 2005 to 2014. Just before this period, the *Great Heisei Municipal Mergers* occurred. Many municipalities chose to merge, especially between fiscal years 2004 and 2005, in response to the special municipal merger law, which incentivized municipal mergers by stipulating favorable fiscal treatment for merged municipalities. As a result, the number of municipalities rapidly decreased, dropping from 3232 in 1998 to 1821 in 2006 by the deadline of the special law.[11] Taking this into account, we exclude any municipalities that underwent a merger during our sample period.

Using a threshold of 30,000 residents, we mainly focus on municipalities with a population size between 10 and 50 thousand. The resultant data are from 639 municipalities over 10 years.

Fiscal statements As explained above, municipalities are now expected to prepare 12 financial statements, namely, four types of statements (a statement of financial position, statement of financial performance, statement of changes in net assets/equity, and cash flow statement) for three types of coverage, that is, ordinary accounts (FSs), consolidated accounts (CFSs) and government-wide accounts (GFSs). Our basic specification sets $T_{i,t}$ equal to one if municipality i compiles all four statements for its FSs in fiscal year t. If any one of the four statements for an FS is incomplete, then $T_{i,t}$ is zero. Many municipalities started compiling the new financial statements and continued to compile them every year afterward, but some municipalities compiled the new financial statements for one or two years and then did not continue compiling and disclosing them. Some other municipalities compiled the new financial statements in one year, did not do so the next year, and then compiled them again in the third year.

We also consider three other variables for other types of account coverage as a robustness check. The first variable takes the value of 1 if a municipality compiles all four statements for its CFSs, and the second takes the value of 1 if the municipality compiles all statements for its GFSs. The third variable is the ratio of the compiled statements to the 12 overall financial statements.[12]

Instrumental variable Our instrumental variable, Z_{it}, is an indicator variable that represents whether municipality i was expected to compile the new financial statements in fiscal year t. Namely, Z_{it} takes a value of 1 for cities with more than 30,000 residents in fiscal year 2010 and afterward and for other municipalities in fiscal year 2012 and afterward. The MIC notice did not mention the reference year used for the population size data; thus, we base Z_{it} on population size figures from 2007.

Outcome variables Our main outcome variable is the primary expenditures of ordinary accounts, which is defined as total expenditures minus the repayment of debts. The expenditure variables are constructed from cash-based settlements and converted to their logarithmic form on a per capita basis. Municipalities compile the new financial statements in addition to traditional cash-based settlement documents. Therefore, the data after the introduction of the new statements are consistent with the data before the introduction.

We focus on expenditures for two reasons. First, the reform of the public accounting system in 2007 aimed at both cost management and asset and debt management, as explained in Section 2.1. Second, tax revenue is not very flexible in the Japanese local public financial system (Bessho, 2016). Municipalities have the authority to raise tax rates beyond the rates stipulated in the Local Tax Act and to individually levy new taxes, but the revenues from these policies are very small. When municipalities expand their expenditures on, for example, public works, they usually rely on intergovernmental transfers from the central government. That is, a change in the number of intergovernmental transfers usually stems from a change in the corresponding expenditure or a change in the central government's policy.

Moreover, we examine the effects on expenditures according to their type, such as expenditures for personnel, supplies and services, maintenance, social assistance, grants, public construction works, loans for other accounts, transfers to public enterprises, and other expenses. The personnel expenses comprise salaries for public employees, councilors, and temporary employees. The supply and service expenses correspond to current expenditures other than personnel expenses, maintenance and repair expenses, social assistance expenses, and grant expenses. Thus, the supply and service expenses include business travel expenses for public employees, equipment purchase costs, and expenses for specially commissioned public projects. The maintenance expenses pertain to managing or repairing public facilities and roads. The social assistance expenses include expenses for public assistance programs and welfare services for children and elderly people. The grant expenses comprise grants and subsidies provided to other governments (prefectures, municipalities, and extragovernmental organizations) and residents. The construction work expenses correspond to the construction of public infrastructure such as public parks, roads, and schools. Expenses for not only new construction but also large-scale repairs and the purchase of heavy equipment are included in this category. The loans for other accounts are loans for and investments in other accounts within and outside the municipal governments. The transfers to public enterprises include those for water supply and sewage systems, hospitals, transportation (buses, streetcars and subways), health insurance and long-term care insurance. In this paper, we compute other expenses as primary expenditures minus the sum of the aforementioned expenses and additions to reserve funds.

[11] The merged municipalities responded to the incentives by increasing their public investments and borrowing just before the mergers (Hirota and Yunoue, 2017). The merged municipalities became free riders in the sense that they shifted the responsibility of repaying this borrowed money to their partners.

[12] For FYs 2013 and 2014, the only available data are on whether a municipality compiled all four statements for each category (FSs, CFSs and GFSs).

Municipalities have different degrees of influence on different expenditure types. The MIC categorizes expenditures as mandatory and discretionary expenditures. Mandatory expenditures comprise personnel and social assistance expenses and debt service. Personnel expenses are mandatory in that many public officers are employed on a long-term basis. Regarding social assistance expenses, redistributive policies are mostly designed by the central government and often subsidized by matching grants. Municipal governments, however, can control these expenses by, for example, hiring temporary officers instead of regular officers. They often influence social assistance expenses by revising their own independent and unsubsidized projects, which account for a substantial fraction of these expenses.[13] Other expenditure items categorized as discretionary items by the MIC are adjusted according to municipal policies.

We also study the effects of the new financial statements on the revenue side. Our focus is on taxes, fees, intergovernmental transfers, debt, property-related income and other revenues. Intergovernmental transfers are the sum of general-purpose grants (local allocation tax grants) and matching grants (central government subsidies). Property income is the sum of rents from fixed properties such as land and buildings and revenues from sales. Our data cannot distinguish between rents and sales revenue. The other revenue is equal to the sum of miscellaneous revenue, and it mainly comprises the principal and interest of loans.

Control variables The control variables in the base specification are divided into two categories. The first group is standard demographic variables, such as the quartic function of the population size, the share of the population under the age of 15 years and its squared term, the share and the squared share of the population over the age of 65 years, the share and the squared share of primary industrial workers among total workers, and the share and the squared share of secondary industrial workers among total workers.

In the second category is a variable denoting the number of years since the focal municipality's last merger. If the last merger occurred before 1998, then this variable is set to zero. During the period of the *Great Heisei Municipal Mergers*, the merged municipalities were given preferential fiscal treatment for 15 years after the merger from 1999 to 2005 (Hirota and Yunoue, 2017). These treatments could affect expenditures during our sample period.

For the robustness checks, the debt outstanding per capita and the most recent election results of the mayors are used. For the most recent mayoral election results, we construct a binary variable that takes the value of 1 if the focal mayor was elected without a vote in the last election.[14] One could argue that the partisanship of the mayor is important, but most candidates run as independents in local elections in Japan; thus, we do not use a partisanship variable.

2.2.2 Summary statistics

Table 1 shows the summary statistics of the municipalities with a population size between 10 and 50 thousand. The expenditure variables are converted to their per capita form. However, after limiting the sample, we can still see a large disparity in terms of financial structures. For example, the sample average of primary expenditures is 440,000 JPY (approximately 4400 USD), while the minimum value is 184,000 JPY (Kanmaki Town, Nara Prefecture, in 2008). The maximum value is exceptional; it was recorded in 2012 in Onagawa Town in Miyagi Prefecture, just after the Great East Japan Earthquake in 2011. The 95th percentile is 807,000 JPY. The demographic structures also differ among municipalities. The ratio of people aged 15 years or younger ranges from 5.6 to 20 percent, and the ratio of people aged 65 years or older ranges from 13 to 51 percent.

2.3 Potential effects

Before turning to our econometric specification, this subsection discusses the potential effects of the new financial statements in our setting. Kobayashi et al. (2016) and Kuroki et al. (2022), who investigate the studied effects based on the surveys of financial department officers in Japanese local governments, propose the following three views introduced by Ansari and Euske (1987): the technical-rational view, the socio-political view, and the institutional view. Both studies support the institutional view, and the technical-rational view is related to the economics literature (Christofzik, 2019; Dorn et al., 2021). Here, we hypothesize the effects on the fiscal variables based on these two views.[15]

The technical-rational view focuses on the technical advantages of accrual accounting, although such accounting does not affect fiscal constraints. As Cavanagh et al. (2016) summarize, the weaknesses of cash-based accounting come from its two properties. First, cash-based accounting recognizes transactions only when the associated cash is received or paid. Second, it does not maintain comprehensive or up-to-date records of the value of assets and liabilities. In contrast, accrual accounting records transactions, both cash transactions and non-cash flows, in flow reports when they occur. It also records the values of assets and liabilities in balance sheets, including the values of physical assets, depreciation, insurance claim obligations and contingent claims. Thus, accrual accounting provides information that is more comprehensive and transparent than that provided by cash-based accounting. As Christofzik (2019) argues, these features are expected to help reveal the long-term budgetary impact of a policy decision and contribute to intergenerational equity, efficiency and accountability. Particularly, a higher degree of transparency can improve

[13] A report from the Ministry of Health, Labor and Welfare shows that local governments expensed 13.8 trillion yen for social security policies, and around one-quarter of this money was spent on independent and unsubsidized projects (3.8 trillion yen) in 2011. For the year 2013, Hayashi (2016) estimates this figure as 30.6%.

[14] A mayor can be elected without a vote if no one runs as an opposing candidate. As shown in Table 1, this is not uncommon in Japanese local governments.

[15] The socio-political view focuses on the power relations within governments, that is, the effects of politicians on the implementation of accrual accounting. Since our main goal is to examine the effects of the new statements and Kobayashi et al. (2016) do not support this view, we do not employ this view here.

Table 1
Summary statistics.

Variables	Mean	Std Dev	Min	Max
Treatment				
FS: statements for ordinary accounts	0.50	0.50	0.00	1.00
CFS: statements for consolidated accounts	0.32	0.47	0.00	1.00
GFS: statements for government-wide accounts	0.32	0.47	0.00	1.00
Ratio of statements	0.41	0.41	0.00	1.00
Expenditures (thousand yen, per capita)				
Primary expenditures	440.28	354.01	183.96	10 078.66
Personnel	82.67	26.17	33.34	342.85
Supplies and services	64.60	53.24	19.65	1794.63
Social assistance	53.51	23.44	10.88	343.51
Grants	60.58	44.11	6.80	1274.56
Maintenance	5.25	6.05	0.00	68.92
Construction work	77.87	111.10	1.31	4360.97
Additions to reserves	30.07	179.56	0.00	6702.28
Loans for other accounts	6.40	16.25	0.00	1025.86
Transfers to public enterprises	51.89	31.94	15.18	2071.27
Other expenses	7.44	67.95	0.00	2896.87
Revenues (thousand yen, per capita)				
Taxes	118.65	52.08	19.22	733.32
Fees	8.47	6.21	0.01	104.75
Intergovernmental transfers	223.72	233.64	6.80	7467.85
Debt revenue	46.12	47.81	0.00	2954.10
Other revenues	13.62	18.36	0.94	998.56
Covariates				
Population size (thousand)	24.77	11.13	6.86	55.81
Share of population aged <15 (%)	12.57	2.21	5.57	20.72
Share of population aged >65 (%)	27.98	5.87	12.62	51.30
Share of primary industry (%)	11.51	8.44	0.50	43.80
Share of secondary industry (%)	28.63	8.01	8.90	52.90
Share of tertiary industry (%)	59.59	8.79	36.30	90.50
Years since the last municipal merger	2.31	3.74	0.00	17.00
Debt outstanding (thousand yen, per capita)	511.41	282.57	1.48	4292.74
Last election with votes	0.65	0.48	0.00	1.00
Financial Capability Indicator	0.51	0.26	0.14	1.92

(Note) The sample is 639 municipalities with a population size between 10 and 50 thousand. The sample period is from 2005 to 2014, and the number of observations is 6390. "FS" means the financial statements of ordinary accounts, "CFS" is "consolidated financial statements", and "GFS" is "government-wide financial statements". CFSs cover both ordinary accounts and selected public enterprise accounts, and GFSs cover ordinary accounts and special accounts for other extragovernmental organizations. FS, CFS and GFS are binary variables and are equal to one if all four statements are compiled. One thousand yen is approximately 10 USD.

fiscal discipline and the effectiveness of fiscal rules, since governments tend to avoid rules that use relatively intransparent budgets (e.g., Milesi-Ferretti, 2004).

This view assumes that such information is utilized by politicians (mayors and council members) and voters, who can influence fiscal decision making directly or indirectly. According to Japanese literature, municipal governments may well assume that the central government is a potential user with the authority to determine the number of vertical transfers (Kuroki and Hirose, 2020). In this case, accrual accounting can affect fiscal variables in the following way. An increase in transparency leads to the efficient use of public funds, which decreases total expenditures if the levels of public service are kept unchanged. Particularly, investments made in public infrastructure could decrease once depreciation costs are recognized. Personnel expenses also could decrease based on the value of long-term liabilities due to the hiring of public officers. If the current levels of public service are insufficient, then they can be improved by maintaining total expenditures. Investments in public infrastructure and maintenance expenses might increase once the depreciation of nonfinancial assets is recognized. Personnel expenses might decrease in the short run if regular public officers are substituted for temporary ones. An accrual accounting reform requires an increase in administration costs for new IT systems, staff training and external support services (Dorn et al., 2021), resulting in increases in expenditures, especially in the short run. Social assistance expenses might not change since they are current expenditures.

The institutional view focuses on the normative pressures that governments face when introducing new financial statements. In our setting, municipal governments may be pressured to compile these statements, especially by the central government. Kobayashi et al. (2016) find that the majority of the respondents to their survey agree that "the adoption of accrual accounting was made to conform with central government policy rather than because of a perceived need within the local authority". Kuroki et al. (2022) also write that "local governments gain against costs by just adopting mandatory accrual accounting". Thus, as Pina et al. (2009) note, accrual accounting may be adopted for its symbolic value pertaining to "good management". Thus, if the new financial statements are just a symbol of management reform, they might be "decoupled" and not have any impact on fiscal variables. However, it is also possible for municipalities to reconstruct their expenditures, considering that the central government positioned accrual accounting

as a part of its administrative reform. For example, municipalities could overhaul their projects, particularly their own independent and unsubsidized projects, which they have authority over on a discretionary basis. These projects could affect current expenditures, for which accrual accounting provides the same information as cash-based accounting. For example, social assistance expenses might decrease if independent and unsubsidized projects have become too generous.

3 Empirical strategy

3.1 Estimation equation

In this section, we describe our empirical strategy of applying DID-IV to identify the fiscal effects of introducing new financial statements, including balance sheets. Let Y_{ipt} denote an outcome variable, such as per capita primary expenditures, of municipality i in prefecture p for fiscal year t. Our regression equation is:

$$Y_{ipt} = \beta T_{ipt} + \delta X_{ipt} + \mu_i + \sum_i \gamma_i \text{Trend}_{ip} + \tau_{pt} + \epsilon_{ipt} \tag{1}$$

where T_{ipt} is an indicator variable for the creation of the financial statements of municipality i in prefecture p in fiscal year t, X_{ipt} is a vector of time-varying covariates, μ_i is the time-invariant and unobservable fixed effects of municipality i, Trend_{ip} is the municipality-specific time trend, τ_{pt} is the prefecture-year specific fixed effects, and ϵ_{ipt} is an error term. β is the parameter of interest, and δ and γ are additional parameters to be estimated.

We include prefecture-year specific fixed effects, τ_{pt}, for two reasons. The first is to control for regional shocks such as business cycles and changes in national policies. For example, the central government promoted the Second Decentralization Reform on a nationwide basis in 2007, as explained above. We control for the effects of this reform using prefecture-year specific fixed effects. The second reason is to control for the effect of prefectures, which are upper-level local governments. Since prefectures and municipalities usually maintain close relationships, a prefectural policy often affects the policies of the municipalities under the prefecture. Furthermore, municipalities under the same prefecture often behave similarly because they routinely consult with their upper government.

We also conduct event study regressions to test the parallel trends assumption by extending (1). Our regression equation takes the following form:

$$Y_{ipt} = \sum_{m=-G}^{M} \beta_m T_{ip,t-m} + \delta^{ES} X_{ipt} + \mu_i^{ES} + \sum_i \gamma_i^{ES} \text{Trend}_{ip} + \tau_{pt}^{ES} + \epsilon_{ipt}^{ES}, \tag{2}$$

where β_m-s, δ^{ES} and γ^{ES} are the coefficients to be estimated, μ_i^{ES} and τ_{pt}^{ES} are municipal and prefecture-year specific fixed effects, and ϵ_{ipt}^{ES} is an error term, following (1). This specification allows Y_{ipt} to be directly affected by the policy from a maximum of M periods before, $T_{ip,t-M}$, to G periods after, $T_{ip,t-G}$, but excludes any effects of the policy arising more than $M+1$ periods before or more than $G+1$ periods after. An event study plot depicts the estimates of the cumulative effects, $\sum_{m=-G}^{k} \beta_m$, at different horizons k. We set $G = M = 2$ to prevent multicollinearity because our instrumental variable uses a two-year timeframe for deadlines . Following Freyaldenhoven et al. (2021), we rearrange Eq. (2) and estimate the following equation:

$$Y_{ipt} = \sum_{k=-G}^{M-1} \phi_k \Delta T_{ip,t-k} + \phi_M T_{ip,t-M} + \phi_{-G-1} 1(1 - T_{ip,t+G}) + \delta^{ES} X_{ipt} + \mu_i^{ES} + \sum_i \gamma_i^{ES} \text{Trend}_{ip} + \tau_{pt}^{ES} + \epsilon_{ipt}^{ES}, \tag{3}$$

where Δ is the first difference operator, and $1(.)$ is an indicator function. ϕ_k corresponds to $\sum_{m=-G}^{k} \beta_m$ and $\phi_{-1} = 0$ as normalization.[16]

3.2 Identification strategy

Our main explanatory variable is $T_{ip,t}$, which denotes whether municipality i compiles the new business-like financial statements. This variable may be endogenous because municipalities that want to improve their fiscal balance or reconstruct their budget are inclined to create the new financial statements to explain the financial situation of their constituency. Another possibility is that municipalities may compile the new financial statements if they want to enhance their accountability and transparency. Thus, ordinary least-squares (OLS) and fixed-effect estimators of Eq. (1) are typically inconsistent. To address this issue, we adopt a DID-IV approach, specifically, a two-stage least squares estimation. In the first stage, $T_{ip,t}$ is regressed on an instrumental variable, X_{ipt}, μ_i, Trend_{ip} and τ_{pt}. In the second stage, the fitted values are used instead of $T_{ip,t}$ in Eq. (1). We have one endogenous explanatory variable and one excluded instrument; thus, Eq. (1) is just-identified.[17]

Our instrumental variable, Z_{it}, is a binary variable that represents whether municipality i was expected to compile the new financial statements in fiscal year t. It is equal to one after the deadline set by the central government. That is, Z_{it} takes the value of

[16] In the case of $G = M = 2$, the terms associated with ϕs are $\phi_{-3} 1(1 - T_{ip,t+2}) + \phi_{-2} \Delta T_{ip,t+2} + \phi_0 \Delta T_{ip,t} + \phi_1 \Delta T_{ip,t-1} + \phi_2 \Delta T_{ip,t-2} + \phi_3 T_{ip,t-3}$ with $\phi_{-1} = 0$. Eq. (2) is a distribution-lag model specification that is equivalent to an event study specification with a restricted effect window as shown in Schmidheiny and Siegloch (2020). Following their terminology, ϕs are binned event indicators (Schmidheiny and Siegloch, 2020, p.7).

[17] We also use a two-stage least squares method to estimate the event study regression (3). ΔT_{ipt} and $T_{ip,t-M}$ are endogenous variables, and the corresponding ΔZ_{it} and Z_{it} are used as excluded instrumental variables. Eq. (3) is also just-identified.

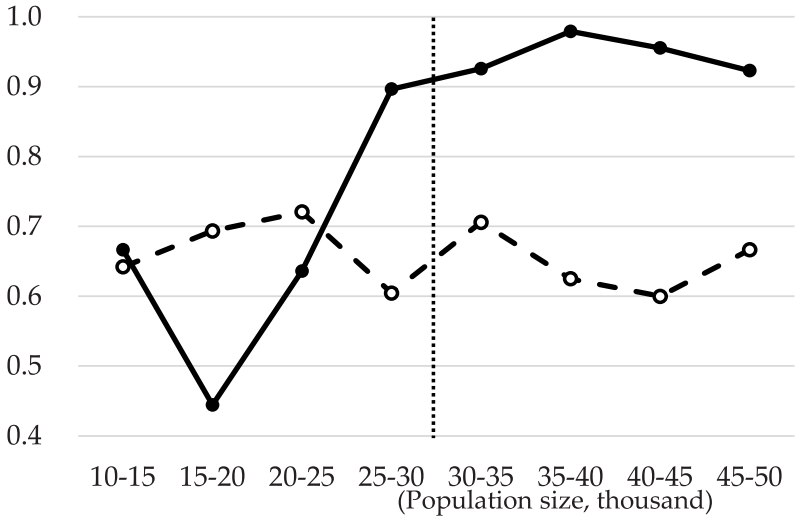


Fig. 1. Compilation ratio of the new financial statements in 2010. (Note) The solid line represents cities, and the dashed line represents towns and villages. The vertical line shows the population size threshold of 30,000.

1 for cities with more than 30,000 residents in fiscal year 2010 and later and for other municipalities in fiscal year 2012 and later. This means that our identification strategy uses the variation in the deadlines for compiling accrual-based financial statements, that is, in population size and municipality category.

A DID-IV approach can be used to identify the local average treatment effect on treatment switchers, specifically, those whose treatment status is affected by the instrument. In particular, we estimate the average response of the large cities that compiled the new financial statements but would not have compiled them if the MIC notice had not been given. To estimate this effect, we make the following four assumptions (Hudson et al., 2017).

First, the instrument affects the outcome only through the treatment. Second, the effect of the instrument on the treatment is monotonic. Third, the instrument affects only the contemporaneous treatment variable. Fourth, both the outcome and the treatment variables have parallel trends.

The first assumption is a standard exogenous restriction in the context of instrumental variable estimation. We can assume that Z_{it} is exogenous because the deadlines were set by the central government. Although Japanese local governments often exert an influence on the central government's decision making, we find no evidence or anecdotes that suggest local government involvement in the decision regarding the different deadlines. Moreover, a threshold of 30,000 residents was not used for other policies, as explained above.

The second assumption concerns the relevancy of the instruments. Our instrument, Z_{it}, can be considered relevant because the notice from the MIC encouraged the municipalities to compile the new financial statements despite the absence of a penalty for deviation. Fig. 1 shows the ratios of the municipalities that compiled the new financial statements by population size in 2010. The solid line is for cities, and the dashed line is for towns and villages. The vertical dotted line represents the threshold of 30,000 residents. Thus, $Z_{i,2010} = 1$ for the solid line to the right of the dotted line. This figure shows that the compilation ratios of cities are higher on the right side of the dotted line than on the left side. The ratio immediately to the left of the threshold is high and almost the same as those on the right-hand side. This may be because cities whose population sizes were slightly less than 30,000 when the MIC notice was issued expected their population to exceed 30,000 within the deadline year. Turning to towns and villages, we do not observe similar patterns: the ratios stay at the same level, that is, close to the threshold for cities. These results suggest that the deadline set by the central government worked well in 2010. These observations may imply that our instrument is not weak. The relevance of our instruments is also confirmed in the first-stage regression below.

The third assumption, which regards the contemporaneous effects on the treatment variable, is considered to be satisfied. Fig. 2 shows the ratios of the municipalities that compiled the new financial statements in each fiscal year. The panel on the left is for cities with at least 30,000 residents ($Z_{i,2010} = 1$), and the panel on the right is for small cities, towns and villages with $Z_{i,2010} = 0$. The vertical lines at FY2010 and FY2012 represent the MIC's notice instructing large cities and small towns, respectively, to compile the new financial statements. The ratio increased more in 2010 for large cities than for small towns. Approximately 94 percent of large cities compiled the four new financial statements in 2010, while 64 percent of small municipalities compiled them. This sharp increase in the ratios between fiscal years 2009 and 2010 may suggest that the assumption holds in our setting.

The map in the online appendix shows the year during which FSs were compiled for the first time, that is, when T_{ipt} increased from zero to one. Although the municipalities that compiled the new financial statements later or did not compile them until 2016 are scattered across the mainland, many seem to be concentrated in Hokkaido, the north island. Since this north island consists of one prefecture, this concentration could stem from the prefecture policy. Prefecture-year specific fixed effects can control for the effects of this concentration in our regression analysis.

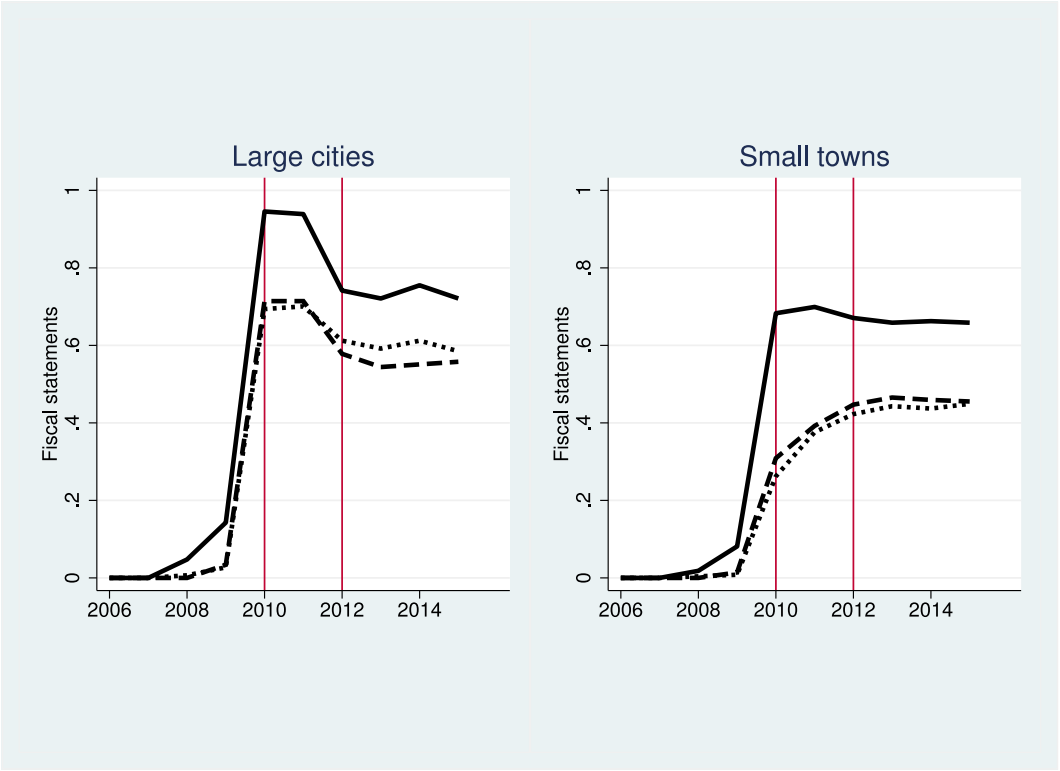


Fig. 2. Compilation ratio of new financial statements. (Note) "Large" cities are cities with a population size greater than 30,000, and "small" towns are cities with a population size less than 30,000 as well as towns and villages. The lines show the ratios of the municipalities that compiled new financial statements for the corresponding fiscal years. The solid lines represent FSs (statements for ordinary accounts), the dashed lines are CFSs (statements for consolidated accounts), and the dotted lines are GFSs (statements for government-wide accounts).

The fourth assumption, which regards parallel trends, is a standard assumption in a DID estimation. As the parallel assumption might not be satisfied, we check this assumption using event studies in the following sections.

We note three points about our estimation strategy. First, one may argue that a regression discontinuity design or a difference-in-discontinuity design (Grembi et al., 2016) is suitable for our setting since the deadlines vary according to the population threshold. We cannot apply a difference-in-discontinuity design to our full sample because the deadlines also depend on the category of each municipality and its population size. That is, there are some "towns" with more than 30,000 residents but a late-2012 deadline. When we limit the sample to cities (excluding towns and villages), our instrument does not work well partly because there are few cities with populations of less than 30,000. Thus, we do not report the results here.[18]

Second, recent studies have called attention to the DID estimation that exploits the variation across groups based on when they receive treatment (Baker, 2019; Sun and Abraham, 2021; Goodman-Bacon, 2021). The coefficient of the two-way fixed-effect estimator, which is used in our regression (1), is shown to be "a weighted average of all possible two-group/two-period DD estimators in the data" (Goodman-Bacon, 2021). The weights depend on the size of each subgroup and the variance in the treatment.

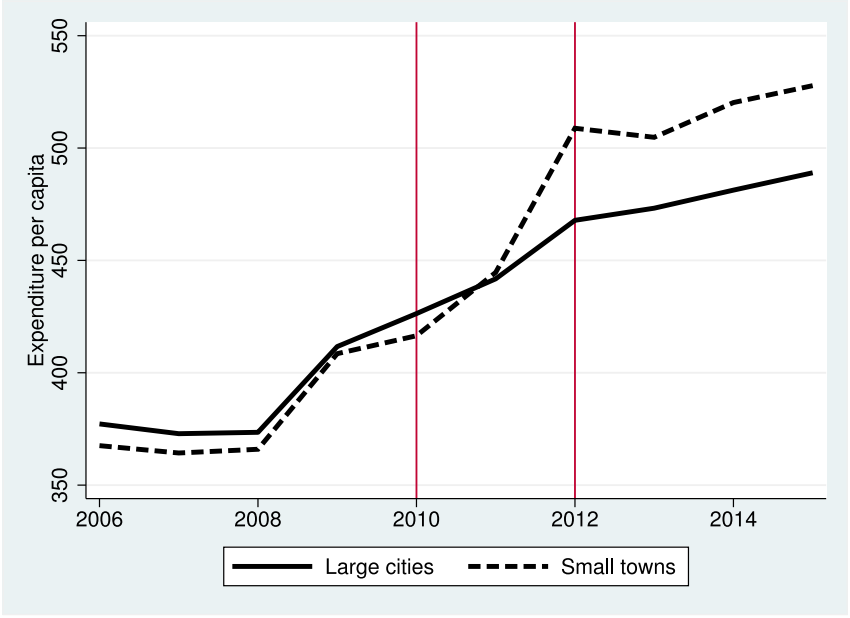
Third, our instrumental variable does not resolve all endogeneity concerns. Two concerns should be noted. First, the difference between the two deadlines is only two years. The ratios of the large cities that compiled the new financial statements jumped in 2010; however, during the same time, the ratios of small towns also increased, as shown in Fig. 2. Second, as shown in Fig. 2, the ratios of small towns did not increase substantially in 2012, when their deadline occurred. The ratios of large cities even decreased during this year. These observations could cast doubt on the validity of our instrument.

To investigate the latter two concerns, we limit the sample period to before the deadline for towns and villages as a robustness check. By doing so, we omit the variation in 2012 from the estimation. Other robustness checks involve changes in the covariates and the sample selection process. See Online Appendix C for details.

Fig. 3 shows the average expenditures per capita by fiscal year. Panel A shows the primary expenditures per capita, and Panel B shows the social assistance expenses per capita. The solid lines are for the treatment group, namely, cities with at least 30,000 residents ($Z_{i,2010} = 1$), and the dashed lines are for the control group, specifically, small cities, towns and villages with $Z_{i,2010} = 0$. The vertical lines at FY2010 and FY2012 represent the two deadlines.

[18] The results are available upon request.

A. Primary expenditures



B. Social assistance expenses

Fig. 3. Average expenditures. (Note) "Large" cities are cities with a population size of more than 30,000, and "Small" towns are cities with a population size of less than 30,000, towns and villages. The left vertical red line is the deadline for large cities to compile new financial statements, and the right vertical line is this deadline for small towns.

Panel A suggests that before 2010, both the treatment and control groups had similar levels of primary expenditures; however, after 2010, the expenditures of the control group increased more than those of the treatment group. Regarding social assistance expenses, the levels of the two groups are different, but both groups show almost parallel increasing trends. These figures might suggest that the new financial statements are correlated with primary expenditures but not with social assistance expenses; however, municipality and prefecture-year fixed effects, other covariates and endogeneity are not fully controlled for in these figures.

Table 2
Characteristics of small towns with and without financial statements in 2007.

Variables	Compiled	Not compiled	Difference
# of towns	336	156	
Outcome (thousand yen, per capita)			
Primary expenditures	371.96	347.79	24.17
Personnel	86.08	83.93	2.15
Supplies and services	54.41	52.54	1.86
Social assistance	36.36	34.10	2.27
Grants	50.52	55.44	−4.92
Maintenance	3.87	4.80	−0.925**
Construction work	61.89	51.59	10.294***
Additions to reserves	15.06	11.78	3.283*
Loans for other accounts	4.14	6.53	−2.388**
Transfers to public enterprises	46.12	44.48	1.64
Other expenses	13.52	2.61	10.90
Covariates			
Population size (thousand)	21.07	20.82	0.25
Share of population aged <15 (%)	13.21	13.02	0.20
Share of population aged >65 (%)	25.92	25.34	0.58
Share of primary industry (%)	12.59	11.40	1.19
Share of secondary industry (%)	29.00	29.04	−0.03
Share of tertiary industry (%)	57.92	58.91	−0.98

(Note) This table shows averages as of 2007 for small towns (cities with a population size of less than 30,000, towns and villages) based on whether they compiled new financial statements for ordinary accounts (FSs) in 2010, when their deadline had not arrived. ***, ** represent that the averages are statistically significantly different at a significance level of 1% and 5%, respectively.

Fig. 4. Event study plots: Primary expenditures. (Note) The graphs show the estimation results of event study estimations with instrumental variables. The vertical bars show the 95% confidence intervals. The main explanatory variable is that of FSs. All the models control for time-varying covariates, municipality fixed effects and trends, and prefecture-year-specific fixed effects.

As seen in Fig. 2, some small municipalities prepared the new financial statements before the deadline. Here, we examine the characteristics of these municipalities. For the year 2007, prior to both deadlines, Table 2 compares the outcome variables and covariates of the small municipalities that compiled the new financial statements in 2010 with the outcome variables and covariates of those that did not . There does not seem to be substantial differences in the covariates between the municipalities with and without the new financial statements. The primary expenditures are not significantly different, but this is not the case for individual expense items. The municipalities with the new financial statements spent more on construction work than those without the statements, and they spent less on maintenance and loans for other accounts. These differences might be related to the decision to prepare the new financial statements, introducing endogeneity. We employ an instrumental variable to cope with this possibility.

4 Empirical results

4.1 Primary expenditures

Before presenting the DID-IV estimation results, we show the results of the event study shown in Fig. 4 to test the parallel trends assumption. This figure plots the results of Eq. (3), with dots showing the point estimates and vertical bars showing the 95%

Table 3
Estimation results: Primary expenditures.

	FS	CFS	GFS	Ratio of statements	Reduced form
Simple FE	−0.014**	−0.018***	−0.017**	−0.026	−0.004
	[0.006]	[0.007]	[0.007]	[0.009]	[0.010]
DID-IV	0.011	0.008	0.008	0.010	–
	[0.059]	[0.039]	[0.041]	[0.051]	–
Weak IV	27.00	40.10	42.54	51.59	–
Covariates	Yes	Yes	Yes	Yes	Yes
Prefecture-Year FE	Yes	Yes	Yes	Yes	Yes
Municipal trend	Yes	Yes	Yes	Yes	Yes
# of observations	6390	6390	6390	6390	6390
# of municipalities	639	639	639	639	639

(Note) FS, CFS and GFS are binary variables and are equal to one if all four statements are compiled. "FS" means the financial statements of ordinary accounts, "CFS" is "consolidated financial statements", and "GFS" is "government-wide financial statements". CFSs cover both ordinary accounts and selected public enterprise accounts, and GFSs cover ordinary accounts and special accounts for other extragovernmental organizations. The "ratio of statements" is defined as a ratio of the number of compiled new financial statements to 12, which is the maximum number of statements. Clustered standard errors at municipality level are given in brackets. ***, **, * represent that the estimates are statistically significantly different from zero at a significance level of 1%, 5% and 10%, respectively. Weak IV is the Cragg–Donald Wald F statistic. All models control for time-varying covariates, municipality fixed effects and trends, and prefecture-year specific fixed effects.

confidence intervals. This plot seems to support the parallel trends assumption and the lack of anticipation effects. It is possible that the local governments had to prepare the new statements before the deadlines, but such effects were not observed in our data.

Table 3 presents the estimation results, where the dependent variable is the log of primary expenditures in the ordinary account per capita. The first three columns show the results in which the main explanatory variables are the indicator of the new financial statements for ordinary accounts (FSs), that of consolidated accounts (CFSs), and that of government-wide accounts (GFSs). The fourth column shows the ratio of the number of new compiled financial statements to 12, which is the maximum number of statements. The fifth column presents the results of the reduced form with the instrument $Z_{ip,t}$ as an explanatory variable. The first row shows the results of the simple fixed-effect (FE) model, and the second row shows the results of the DID-IV model. All the specifications use the full set of covariates, prefecture-year specific fixed effects and municipal trends.

The coefficients of the new financial statement variable are estimated to be negative and statistically significant when the indicator variables for FSs, CFSs and GFSs and the simple FE model are used. The point estimate suggests that compiling new financial statements is associated with a decrease in primary expenditures per capita ranging from 1.4 to 1.8 percent. These results may imply the effects of the new financial statements, but it is possible that municipalities that are or that plan to be actively engaged in fiscal adjustment tend to compile the new financial statements. To circumvent this issue, we turn to the results of the DID-IV estimation.

To check the relevance of our instruments, we compute Cragg–Donald F-statistics for the weak instruments, which are shown in the third row. These values are sufficiently large, which suggests that our instrument is relevant. In contrast to the results of the simple FE estimation, the results in the first three columns show that the coefficients of the new financial statement variable are estimated to be positive but not statistically significant, regardless of the coverage of the financial statements.[19] These results imply that the effects detected by the simple FE model could be downward biased, possibly because the municipalities that are willing to implement fiscal adjustments are inclined to compile the new financial statements. These results are in line with those of Christofzik (2019) and Dorn et al. (2021), who find no evidence of an impact on the overall financial balance of the municipal core budget. The new statements, however, may have different effects across expenditure categories. We examine this possibility below.

4.2 Expenditure categories

The results of the event study focused on selected expenditure and revenue categories are shown in Fig. 5 to test the parallel trends assumption. The plots corresponding to the other expenditure and revenue categories are shown in the online appendix. These plots seem to support the parallel trends assumption.

Table 4 shows the estimation results for each expenditure category. The three columns correspond to the cases of new financial statements for ordinary accounts (FSs), consolidated accounts (CFSs), and government-wide accounts (GFSs).

Here, we note three points. First, all the estimated coefficients, except for "other" expenses, are negative and statistically significant for some categories. This seems inconsistent with the results in Table 3, which suggest statistically insignificant but positive effects on primary expenditures, which is the sum of the expenditure components. However, it is possible that the municipalities reallocated expenditures in their own ways and kept their total primary expenditures almost unchanged: some municipalities increased an expenditure category while others decreased the same category. The positive coefficients are estimated

[19] These results appear to be inconsistent with Fig. 3, but the estimated coefficient of the reduced form (the fifth column) is also small; thus, the different trends shown in Fig. 3 stem from an omitted variable.

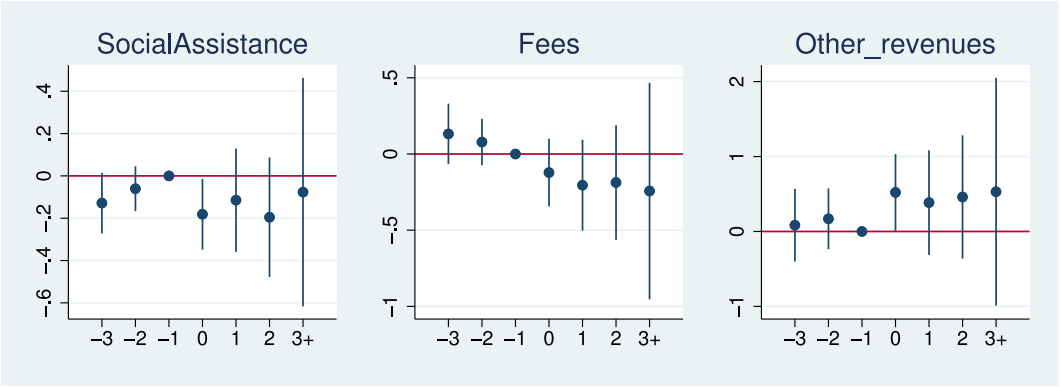


Fig. 5. Event study plots: Selected categories. (Note) These graphs show the estimation results of event study estimations with instrumental variables. The vertical bars show the 95% confidence intervals. The main explanatory variable is that of FSs. All the models control for time-varying covariates, municipality fixed effects and trends, and prefecture-year specific fixed effects.

Table 4
DID-IV estimation results: primary expenditure categories.

	FS	CFS	GFS
Personnel	−0.010	−0.007	−0.007
	[0.021]	[0.015]	[0.016]
Supplies and services	−0.008	−0.005	−0.006
	[0.077]	[0.047]	[0.045]
Social assistance	−0.196***	−0.135***	−0.145***
	[0.050]	[0.033]	[0.035]
Grants	−0.022	−0.015	−0.016
	[0.089]	[0.060]	[0.063]
Maintenance	−0.221	−0.147	−0.156
	[0.142]	[0.098]	[0.106]
Construction works	−0.042	−0.029	−0.031
	[0.213]	[0.145]	[0.156]
Additions to reserves	0.162	0.111	0.119
	[0.536]	[0.367]	[0.394]
Loans for other accounts	−0.267	−0.199	−0.215
	[0.402]	[0.302]	[0.326]
Transfers to pub. Enterp.	−0.093	−0.064	−0.069
	[0.062]	[0.043]	[0.046]
Other	0.330	0.196	0.209
	[1.454]	[0.861]	[0.943]
Weak IV	27.00	40.10	42.54
Covariates	Yes	Yes	Yes
Prefecture-Year FE	Yes	Yes	Yes
Municipal trend	Yes	Yes	Yes
# of observations	6390	6390	6390
# of municipalities	639	639	639

(Note) The estimation method is difference-in-differences with instrumental variables. FS, CFS and GFS are binary variables and are equal to one if all four statements are compiled. "FS" means the financial statements of ordinary accounts, "CFS" is "consolidated financial statements", and "GFS" is "government-wide financial statements". CFSs cover both ordinary accounts and selected public enterprise accounts, and GFSs cover ordinary accounts and special accounts for other extragovernmental organizations. Clustered standard errors at municipality level are given in brackets. ***, **, * represent that the estimates are statistically significantly different from zero at a significance level of 1%, 5% and 10%, respectively. Cragg–Donald Wald F statistics are reported in the bottom row. All models control for time-varying covariates, municipality fixed effects and trends, and prefecture-year specific fixed effects.

for only "other" expenses, but their standard errors are large; this result is possibly due to the large standard deviation compared to the mean (Table 1). These might be the reasons why a statistically significantly positive effect is not detected. Second, the estimated coefficients are statistically significantly and negative for social assistance expenses, regardless of the coverage of the financial statements. This may imply that the municipalities generally reduced this expenditure component after compiling the new financial statements.[20] Third, the estimation results are quantitatively similar across the specifications with different financial

[20] Fig. 3, which does not control other factors, shows the parallel trends of large cities and small towns for social assistance expenses. The results of reduced-form regressions, shown in Appendix B, suggest that a negative relation is detected once we control for both municipality fixed effects and prefecture-year-specific fixed effects. This may be due to regional shocks and the policies of prefectures (upper governments), as discussed in Section 3.1.

Table 5
DID-IV estimation results: revenue categories.

	FS	CFS	GFS
Taxes	−0.004	−0.003	−0.003
	[0.025]	[0.016]	[0.016]
Fees	−0.144*	−0.099**	−0.107**
	[0.075]	[0.049]	[0.051]
Intergovernmental transfers	−0.124	−0.086*	−0.092*
	[0.076]	[0.049]	[0.053]
Property-related income	0.149	0.103	0.110
	[0.320]	[0.221]	[0.237]
Debt revenue	−0.091	−0.062	−0.066
	[0.166]	[0.112]	[0.118]
Other revenues	0.443**	0.306***	0.328***
	[0.182]	[0.113]	[0.119]
Covariates	Yes	Yes	Yes
Prefecture-Year FE	Yes	Yes	Yes
Municipal trend	Yes	Yes	Yes
# of observations	6390	6390	6390
# of municipalities	639	639	639

(Note) The estimation method is difference-in-differences with instrumental variables. FS, CFS and GFS are binary variables and are equal to one if all four statements are compiled. "FS" means the financial statements of ordinary accounts, "CFS" is "consolidated financial statements", and "GFS" is "government-wide financial statements". CFSs cover both ordinary accounts and selected public enterprise accounts, and GFSs cover ordinary accounts and special accounts for other extragovernmental organizations. Property-related income is the sum of property income (for example, rents) and sales revenues from non-financial assets. Clustered standard errors at municipality level are given in brackets. ***, **, * represent that the estimates are statistically significantly different from zero at a significance level of 1%, 5% and 10%, respectively. All models control for time-varying covariates, municipality fixed effects and trends, and prefecture-year specific fixed effects.

statement coverage. Since financial statements with different coverage could provide different information, this could suggest that the information provided by the statements is not necessarily fully utilized.

4.3 Revenue categories

Although our focus is on the expenditure side, we estimate the equation with the revenue components as the dependent variable. The plots in Fig. 5 and the online appendix seem to support the parallel trends assumption. Table 5 shows the results. In the case of tax revenues, the coefficients of the new financial statement variable are estimated to be small and statistically insignificant, which is consistent with our arguments above that tax revenue is relatively inflexible in the Japanese local public finance system (Bessho, 2016). We note three further points. First, the coefficients are estimated to be negative and statistically significant for fees and intergovernmental transfers from the central government. Second, the effects on property-related income are estimated to be positive but statistically insignificant. The sales of nonfinancial assets are included in this component; thus, this result differs from those of Christofzik (2019) and Dorn et al. (2021). Third, the estimates of the coefficients are positive and statistically significant for other revenue. The main item of this other category is the principal and interest of loans to others.

4.4 Event study

It is quite possible that it takes several years for the new financial statements to take effect; thus, it could be interesting to estimate the dynamics of this situation. Therefore, we estimate event study regressions, and the results are shown in Figs. 4 and 5 above. The left-hand side of Fig. 5 is for social assistance expenses, the center is for fees, and the left-hand side is for "other" revenue. We pick up the categories in which the corresponding coefficients in Tables 4 and 5 are estimated to be statistically significant.

The effects on primary expenditures are estimated to be small and statistically insignificant. In the case of social assistance expenses, the point estimates are negative after the compilation of the new financial statements but statistically significant only in the first year.

The effects on fees are estimated to be statistically insignificant in this event study. In the case of "other" revenues, the estimates are statistically significantly positive in only the first year, as in the case with social assistance expenses. These results may suggest that there are no lasting effects on either the expenditure or revenue sides. These estimated non-lasting effects might be because only a limited number of years before and after the transition are considered.

4.5 Robustness checks on the expenditure categories

We conduct some robustness checks. First, we use different combinations of covariates and different sample selections to evaluate the possibility that the results above may depend on the sample selection method or outliers. We use two samples: one consists of municipalities with a population size between 5 and 100 thousand instead of between 10 and 50 thousand, and the other excludes

any municipalities that were severely affected by the Great East Japan Earthquake in 2011 from our base sample. The second is related to the assumptions discussed in Section 3.2. Since we exploit the variation in the timing of the treatment, a "two-group estimation" is useful in examining the heterogeneity of the effects (Goodman-Bacon, 2021). To this end, we estimate the equations while excluding observations after 2010. This estimation is also useful in that it allows us to check the relevance of our instrument. In addition, we run the regressions excluding municipalities whose treatment status is not the same as that of the instrument. Specifically, we exclude any municipalities that compiled the new financial statements before 2008, municipalities that compiled the new financial statements for one year but did not continue compiling and disclosing them, small municipalities that compiled them before their deadline, and municipalities that never compiled them.

The estimation results are robust in three respects. First, when the dependent variable is primary expenditures, the coefficients of the new financial statements are estimated to be small and statistically insignificant. Second, regarding the expenditure categories, the estimated coefficients of the new financial statement variable are negative and statistically significant only when the dependent variable is social assistance expenses. Third, these results are robust across the different types of coverage (FS, CFS, or GFS). See Appendix C for details.

4.6 Heterogeneity

The effects of the new financial statements may vary across municipalities depending on observable or unobservable characteristics. We tried various types of observable characteristics but faced the issue of a weak instrumental variable in many cases. Here, we report the results based on the financial capability indicator (FI). When the FI of a municipality is relatively large, the municipality has more financial capacity, and it is richer.[21] We calculate the median of the FI in 2005 (before our sample period) for our sample municipalities to make a time-invariant indicator variable that takes the value of 1 if a municipality's FI is greater than the median. Then, we add a cross-term between the indicators of the financial statements and the FI as an explanatory variable.[22]

Table C.7 in the online appendix shows the estimation results. In most cases, the coefficients of the cross-term are estimated to be statistically insignificant, and there seems to be no critical heterogeneity depending on the municipalities' fiscal situations.

5 Discussion and conclusion

This paper investigates the fiscal effects of the introduction of business-like financial statements by exploiting the context of Japanese local governments. The central government asked local governments to compile balance sheets and other related financial statements in addition to traditional cash-based settlement documents. It set two different deadlines depending on the type and population size of the local governments. These conditions were exogenous to the local governments. Since the deadlines were not very strict and following the request was not mandatory, we apply DID-IV estimation. Our data are comparable before and after the introduction of the new statements because the traditional cash-based statements were continuously published as the main settlement documents.

Our findings are summarized below. First, the new financial statements do not affect the primary expenditures of ordinary accounts. Second, the new statements negatively affect social assistance expenses. This result is robust across the specifications. Third, the new statements decreased fee revenues while increasing intergovernmental transfer revenues and "other revenues", most of which are revenues from the principal and interest of loans to others. Fourth, the effects of the different coverage of the new financial statements do not differ substantially. Here, we discuss these findings from the perspectives of the technical-rational and institutional views explained in Section 2.

According to the technical-rational view, accrual accounting can enhance transparency and, in turn, improve efficiency and accountability. This should be the case for assets and liabilities. Our results do not support this view, as no change is detected for primary expenditures or construction work expenses, as in Christofzik (2019) and Dorn et al. (2021). The decrease in social assistance expenses is not consistent with the technical-rational view because these expenses are a component of current expenses; thus, the traditional financial statements contain the same information as the new statements. It is also inconsistent with this view that the effects of the different coverage of the statements are similar because statements with different coverage should provide different information.

We cannot completely reject the technical-rational view. As the preparation of the new financial statements requires additional administration costs, such costs might offset the decrease in expenditures generated by improvements in efficiency in the short run. Managerial improvement in public enterprises might decrease cross-subsidies from ordinary accounts. Alternatively, the sale or outsourcing of inefficient public facilities could lead to a decrease in fee revenues. If the new financial statements clarified the status of loans that municipalities had offered to private-sector firms, their loan collection might become stricter, increasing revenues via increases in principal and interest. Another possibility is that, as Dorn et al. (2021) argue, cash-based accounting already provides sufficient information; it may also be that accrual accounting requires estimations and is thus not necessarily more transparent than cash-based accounting (Christofzik, 2019).

[21] The MIC computes this indicator by dividing basic financial revenues by basic financial needs and taking the three-year average. If the FI of a municipality is greater than or equal to one, then the MIC considers the municipality to have sufficient revenue and does not distribute general-purpose equalization transfers, which are called local allocation tax grants. This indicator might be affected by the decisions of local governments; therefore, we use a time-invariant indicator to prevent this possible endogeneity.

[22] We estimate the equations by splitting the sample based on the FI but encounter a weak instrument problem. Thus, we do not report these results here.

Our results may well support the institutional view of the accounting literature (Kobayashi et al., 2016; Kuroki et al., 2022). If the new financial statements were introduced for their symbolic value rather than for their decision-making value (Pina et al., 2009), it would be possible for municipalities to reconstruct their expenditures across the items because the new statements were positioned as a part of an administrative reform. The observed decrease in social assistance expenses may be a result of reducing such projects at local governments' discretion because social assistance expenses can be reduced instantly without short-run adjustment costs. This decrease might, in turn, reduce the fee revenues from the corresponding projects. If the projects are closely related to subsidized projects, then intergovernmental transfers from the central government should decrease at the same time. This may well happen since local governments' discretionary projects are often add-ons to subsidized projects, for which the central government transfers matching grants. Other items may be difficult to streamline immediately. Construction work expenses are often based on long-term plans, and personnel expenses are mandatory in the short run. In addition, it is not surprising that the different coverage of the new financial statements has a similar impact.

The institutional view may be related to public management skills. Dorn et al. (2021) highlight the possibility that public managers and political decision makers cannot use financial statement information and lack management capabilities. This may be the case in our setting. Kobayashi et al. (2016) find that the majority of local governments in Japan do not use information from the new financial statements in their budgeting processes, asset management or debt management, although financial officials acknowledge the usefulness of the information.

This study has some limitations. First, our analysis examines only the short-run effects of the new financial statements, since our data cover only several years after their introduction. The long-run effects of these statements on efficiency could be masked by the transition or short-run implementation costs for consulting services, new IT systems or staff training. The transition costs could be larger for large cities since they faced shorter time constraints for implementation than small municipalities, and many cities constructed systems to compile the new statements. Moreover, accrual accounting requires permanent additional administration costs (Carlin, 2006; Dorn et al., 2021). Second, our instrumental variable depends on the deadlines set by the central government. This instrument might be weak since many small towns compiled the new financial statements before the deadline. These points are worth exploring further in future research.

Declaration of competing interest

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Data availability

Data will be made available on request.

Appendix A. Online appendix

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.ejpoleco.2023.102358.

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