



Administrative Consolidation and the Cost of State Capacity

June 29, 2026

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JEL Classification: H71, H72, H11

keywords: Fiscal capacity, Tax administration, Administrative consolidation, Economies of scale

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Abstract

This paper studies how administrative consolidation affects the performance and cost of fiscal capacity. While consolidation may reduce administrative costs by exploiting scale effects, it may also disrupt the accumulated organizational resources and routines through which governments collect taxes. We examine this trade-off, focusing on Japan's Great Heisei Municipal Mergers, a large wave of municipal consolidation in the early 2000s. Using an event-study based on a difference-in-differences design, we find that mergers reduce tax collection rates beginning in the pre-legal-merger transition period. In contrast, tax administrative costs fall only after formal consolidation, consistent with economies of scale in tax administration. We further find that tax revenue collected per unit of administrative cost increases after consolidation despite the decline in collection rates. These findings show that administrative consolidation weakens the collection margin of fiscal capacity during organizational transition, while lowering the resource cost of raising revenue enough to improve overall cost-effectiveness. The results highlight a trade-off between the operational performance and cost-effectiveness of fiscal capacity.

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1 Introduction

Fiscal capacity is widely viewed as a central component of state capacity because it enables governments to raise revenue, finance public goods, and sustain effective administration (Besley and Persson, 2009; Besley, Ilzetzki, and Persson, 2013; Dincecco and Katz, 2016; Johnson and Koyama, 2017; Acemoglu and Robinson, 2019; Balán, Bergeron, Tourek, and Weigel, 2022; Besley, Burgess, Khan, and Xu, 2022). A growing literature therefore emphasizes investments in fiscal capacity as fundamental to the development of capable states (Besley and Persson, 2014; Pomeranz and Vila-Belda, 2019). At the same time, governments increasingly face pressure to contain administrative costs.¹ Recent budgetary retrenchment and workforce reductions in tax authorities, including the IRS, illustrate that tax administrations are often asked not only to collect more revenue, but also to do so with fewer resources (National Audit Office, 2024; Treasury Inspector General for Tax Administration, 2026). Against this backdrop, local governments have increasingly relied on administrative consolidation as a response to fiscal constraints (Blesse and Diegmann, 2022). In tax administration, particularly, consolidation may reduce average administrative costs through economies of scale and scope because many inputs are fixed or duplicated across jurisdictions (Gauthier, 2013; Alm and Duncan, 2014; Førsund, Edvardsen, and Kittelsen, 2015; Notsu, 2024).²

How such consolidation affects fiscal capacity, however, is theoretically ambiguous. Fiscal capacity is not simply the statutory authority to levy taxes, and it is an accumulated organizational capability built through investments in information systems, trained tax officials, and organized collection agencies (Besley and Persson, 2014; Pomeranz and Vila-Belda, 2019; Braccioli, Mu noz-Sobrado, Piolatto, and Zerbini, 2024). Tax collection also depends on organization-specific routines and expertise, such as maintaining accurate taxpayer information, monitoring compliance, and enforcing delinquent claims. Therefore, consolidation may generate cost savings by eliminating duplicated administrative inputs, while disrupting the accumulation and routines of tax collection skills during the adjustment process. In other words, administrative consolidation may disrupt and reorganize the accumulated organizational resources, routines, and expertise on which tax collection depends.³ This

¹Recent crises, including the Great Recession and the COVID-19 pandemic, have strained public budgets and increased pressure for fiscal consolidation, often through spending cuts viewed as less economically costly than tax increases (Schuknecht, 2020; Alesina, Favero, and Giavazzi, 2019).

²For example, fixed and duplicate inputs include offices, personnel, information systems, service counters, vendor contracts, and standardized procedures.

³In practice, some literature suggests that municipal amalgamation disrupts organization-specific routines, administrative workflows, and coordination mechanisms inherited from pre-merger municipalities (Andrews and Boyne, 2012; Nakazawa, 2014; Blom-Hansen, Houlberg, Serritzlew, and Treisman, 2016; Mughan, 2019;

paper asks whether such consolidation affects fiscal capacity, reduces its cost, or instead creates a trade-off between collection performance and cost efficiency.

To study the performance and cost effects of administrative consolidation, we exploit a large wave of municipal consolidation in Japan, known as the Great Heisei Municipal Mergers. During this reform, the number of municipalities fell sharply in the early 2000s, creating substantial variation in the timing and exposure to administrative consolidation across local governments. These municipal mergers required not only the redrawing of administrative boundaries, but also the integration of tax offices, personnel, taxpayer records, information systems, and collection procedures. We construct a municipality-level panel for 2000–2018 and aggregate pre-merger municipalities to their future post-merger boundaries to compare outcomes within a consistent administrative unit before and after consolidation. In addition, we focus on two main outcomes to investigate the two main effects of consolidation. First, we measure the collection dimension of fiscal capacity using tax collection rates, defined as tax revenue divided by tax liabilities. This measure captures how effectively municipalities convert already-assessed tax obligations into actual revenue within the fiscal year. We then measure the resource cost of this capacity using tax administrative costs, including personnel and other administrative expenditures associated with local tax administration. Together, these outcomes allow us to distinguish whether consolidation weakens tax collection performance, reduces the cost of tax administration, or changes the cost-effectiveness with which municipalities collect taxes.

We estimate the effects of consolidation using an event-study based on a difference-in-differences design that exploits variation in the timing of municipal mergers. This design allows us to trace the dynamic evolution of tax collection rates and tax administrative costs before and after consolidation, rather than estimating only an average post-merger effect. This distinction is central to our analysis. If consolidation disrupts tax collection routines and accumulated organizational resources, the effect may appear during the transition period before the merger, when municipalities begin to reassign personnel, integrate tax records, harmonize information systems, and standardize collection procedures. If consolidation generates economies of scale, by contrast, cost savings may materialize only after the legal merger, when offices, personnel, systems, and administrative operations are formally combined. The event-study framework can examine whether the performance and cost margins of fiscal capacity respond at different points in the consolidation process. Accordingly, we interpret one event year before the merger event as the beginning of the merger-related transition period, rather than as a pure [Hirota, Iwata, and Tanaka, 2022](#)).

pre-treatment year.

The Japanese setting is particularly useful for several reasons. First, the Great Heisei Municipal Mergers constituted a large and concentrated wave of administrative consolidation, generating substantial variation in exposure to mergers across municipalities and over time. Second, municipalities are the relevant administrative unit for studying local fiscal capacity because they are directly responsible for assessing, billing, and collecting major local taxes. Thus, a municipal merger represents a real organizational consolidation of tax administration, not merely a change in political boundaries. Third, merger exposure was geographically widespread, allowing us to compare merging municipalities with non-merging municipalities operating in the same prefecture-year environment. Specifically, our baseline specification includes municipality fixed effects and prefecture-by-year fixed effects, so identification comes from changes within the same municipality relative to other municipalities in the same prefecture and year.

We organize the empirical findings around three outcomes that correspond to the two margins emphasized above. We first examine tax collection rates to assess whether consolidation changes the collection dimension of fiscal capacity. We then turn to tax administrative costs to examine whether consolidation reduces the resources used to administer and collect local taxes. Finally, we study tax revenue relative to tax administrative costs to evaluate the net implication of these two forces for the cost-effectiveness of tax administration.

The first finding is that municipal mergers reduce tax collection rates. Before examining collection performance, we show that mergers do not generate systematic changes in assessed tax liabilities around the merger period. This result indicates that the tax base, tax policy, and assessment capacity are not the main margins affected by consolidation. Therefore, the effects of the merger appear in the share of assessed taxes that municipalities collect within the fiscal year. The main results show that collection rates begin to fall already in event time -1 , before the legal merger takes effect, and remain below the pre-merger reference period after consolidation. This pattern is consistent with the view that merger-related reorganization disrupts the routines required for timely collection, including the integration of taxpayer records, reassignment of tax officials, reconciliation of payment histories, identification of delinquencies, and standardization of enforcement procedures. The decline is especially pronounced for municipal resident taxes, which rely heavily on annually updated information on residents, income, employment, and payments. By contrast, property taxes, whose base is geographically fixed and administratively more stable, exhibit a smaller decline. These results suggest that consolidation

weakens fiscal capacity along the collection margin, not by reducing assessed liabilities, but by making it harder for municipalities to convert those liabilities into current-year revenue during the transition process.

The second finding is that municipal mergers substantially reduce tax administrative costs. In contrast to the decline in tax collection rates, administrative costs do not fall during the pre-merger transition period. Instead, the reduction appears only after the legal merger takes effect and becomes larger over time. This timing is consistent with economies of scale in tax administration. Additional evidence from the composition of administrative inputs supports this interpretation. Personnel costs decline after consolidation, and the number of tax officials also falls, suggesting that merged municipalities reduce duplicated staffing in tax administration. Non-personnel costs, such as supplies and services, exhibit a more delayed response: they temporarily rise after the merger before declining in later years. This pattern is consistent with short-run adjustment costs associated with integrating tax information systems, harmonizing administrative procedures, and reorganizing vendor contracts. Taken together, these results indicate that consolidation lowers the resource cost of operating local tax administration, even as it weakens collection performance during the transition.

The next focus of the paper is the cost-effectiveness of tax administration. The previous two findings show that municipal mergers move the performance and cost margins of fiscal capacity in opposite directions: collection rates decline, while administrative costs fall. Whether consolidation ultimately improves or worsens tax administration depends on which effect dominates. To examine this issue, we measure tax revenue collected per unit of tax administrative cost. We find that this measure increases after municipal mergers. This result implies that the cost savings from consolidation more than offset the decline in collection performance. In other words, merged municipalities collect slightly less effectively from a given stock of assessed liabilities, but they do so with substantially fewer administrative resources. This finding qualifies the interpretation of the decline in collection rates. Municipal mergers weaken the collection margin of fiscal capacity, but they improve the efficiency with which administrative inputs are converted into tax revenue. Therefore, the results reveal a trade-off that would be missed by focusing only on collection rates or only on administrative costs: administrative consolidation can reduce the organizational capacity needed for timely collection while increasing the amount of revenue collected per yen spent on tax administration.

This paper is relevant to two main contexts. First, this study contributes to the literature on state capacity and fiscal capacity. A large body of work views fiscal capacity as a core component of state

capacity and emphasizes that effective taxation depends on the investments in legal, administrative, and informational institutions (Besley and Persson, 2009; Besley et al., 2013; Besley and Persson, 2014; Pomeranz and Vila-Belda, 2019; Besley et al., 2022; Braccioli et al., 2024). State capacity, including tax capacity, is central to public good provision and economic development (Besley and Persson, 2009; Balán et al., 2022). In our setting, municipal mergers reduce the tax collection rate, suggesting that consolidation disrupts the organizational routines through which tax claims are converted into actual revenues. Therefore, our findings extend the literature by showing that fiscal capacity is not only accumulated through institutional investment but can also be weakened when existing administrative organizations are reorganized.

This paper also contributes to a large literature on the consolidation and boundaries of local governments (Alesina, Baqir, and Hoxby, 2004; Weese, 2015; Boje-Kovacs, Mulalic, and Schultz-Nielsen, 2026; Harjunen, Kauria, Saarimaa, and Tukiainen, 2026). Much of this literature studies boundary consolidation as a way to realize economies of scale in the provision of local public services, while also recognizing that larger jurisdictions may entail transition frictions, adjustment costs, and concerns about service quality (Reingewertz, 2012; Moisió and Uusitalo, 2013; Miyazaki, 2014; Blesse and Baskaran, 2016; Allers and Geertsema, 2016; Blom-Hansen et al., 2016; Goto, Sekgetle, and Kuramoto, 2021; Hirota et al., 2022). Our results show that municipal mergers reduce tax administrative costs, consistent with economies of scale, but also weaken fiscal capacity during the transition process. By documenting this trade-off, our findings highlight an important adjustment margin through which municipal mergers affect local public finance.

The remainder of the paper is organized as follows. Section 2 presents the institutional setting. Section 3 describes the data. Section 4 presents the empirical strategy. Section 5 reports the main results on collection performance and administrative costs. Section 6 examines cost-effectiveness, and Section 7 discusses the interpretation and implications. Section 8 concludes.

2 Institutional Background

Japan is a unitary state with a two-tier system of local government. Ordinary local governments consist of prefectures and municipalities. Prefectures are regional governments responsible for functions that require coordination across municipal boundaries or are not suitable for individual municipalities to administer on their own. Municipalities, by contrast, are the basic units of local administration and provide services most directly connected to residents' daily lives, including resident registration,

welfare, childcare, local infrastructure, waste management, education-related administration, and urban planning. For this paper, their role in local taxation is central. Municipalities administer and collect major municipal taxes: they maintain taxpayer records, assess local tax liabilities, issue tax notices, process payments, identify delinquent accounts, and implement collection procedures. Municipalities are therefore the relevant organizational unit for studying the collection margin of fiscal capacity, because they are the administrative bodies that convert assessed local tax liabilities into actual tax revenues.

2.1 The Great Heisei Municipal Mergers

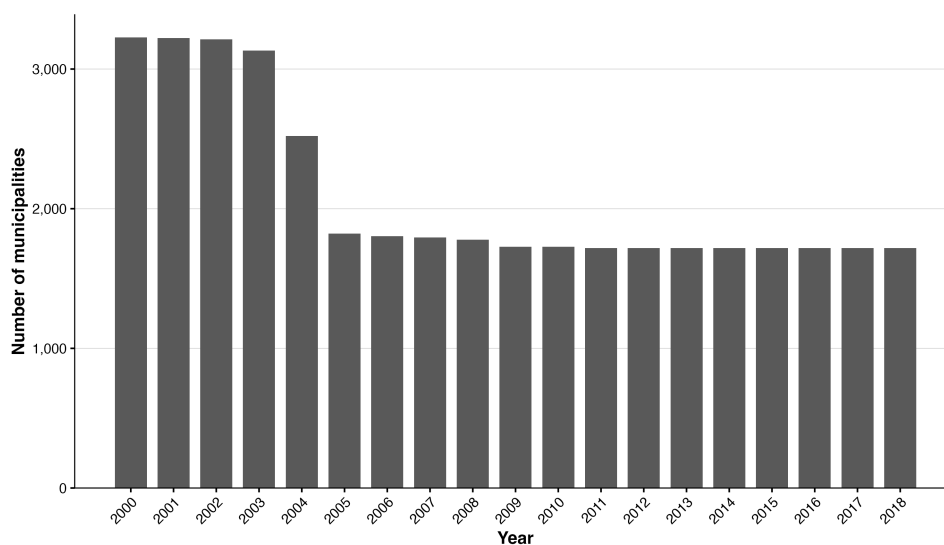
Japan experienced a large wave of municipal consolidation known as the Great Heisei Municipal Mergers. Municipal mergers expanded rapidly in the early 2000s as part of a broader decentralization agenda promoted by the central government. As more administrative responsibilities were expected to be transferred to municipalities, policymakers sought to create local governments with sufficient administrative and fiscal scale to serve as effective recipients of decentralization, while also responding to demographic decline and growing fiscal pressure. The scale of the reform was large: the number of municipalities fell from 3,232 in 1999 to about 1,820 in 2006, making it one of the most substantial reorganizations of local government boundaries in postwar Japan ([Ministry of Internal Affairs and Communications, 2010](#); [Hirota and Yunoue, 2013](#)). For the purposes of this paper, these mergers are important not only because they redrew jurisdictional boundaries, but also because they changed the organizational units responsible for local tax administration.

The central government played an important role in shaping both the incentives for and the timing of municipal mergers. Under the Special Municipal Mergers Law (Shichōson no Gappei no Tokurei-tō ni Kansuru Hōritsu), in effect from 1999 to 2005, municipalities that consolidated were eligible for temporary fiscal and institutional support. This support included grants and special bonds whose repayment was largely assumed by the central government ([Hirota and Yunoue, 2017](#)). These measures lowered the short-run fiscal cost of consolidation and gave municipalities strong incentives to complete mergers before the generous provisions expired ([Cabinet Office, Government of Japan, 2005](#); [Ministry of Internal Affairs and Communications, 2010](#)). As a result, mergers were highly concentrated in a short period, especially in fiscal years 2004 and 2005 ([Ministry of Internal Affairs and Communications, 2010](#)). Figure 1 illustrates this timing: the number of municipalities declined sharply in these two years, confirming that the Great Heisei Municipal Mergers were implemented as

a concentrated wave rather than as a gradual, evenly paced reform.

The Great Heisei mergers were a policy-induced wave of administrative consolidation, but merger exposure was not randomly assigned across municipalities. The central government promoted mergers partly to create municipalities with sufficient administrative and fiscal scale to serve as effective recipients of decentralization, and partly to realize economies of scale in local administration. This policy logic implies that merger decisions were likely related to municipal characteristics associated with population size, demographic decline, and fiscal conditions. Consistent with this view, previous studies show that merger participation was systematically related to such pre-existing municipal characteristics (Weese, 2015; Miyazaki, 2014; Hirota and Yunoue, 2017). This non-random selection is central to the empirical interpretation. Our event-study design does not assume random merger assignment. We examine the identification concerns raised by this assignment process in detail in Section 5 and Section 7.

Figure 1: Number of Municipalities by Year



Note: This figure shows the number of municipalities by year.

The legal merger date, however, did not mark the beginning of administrative change. Before formal consolidation, constituent municipalities had to negotiate and harmonize a wide range of administrative arrangements, including ordinances, personnel assignments, branch-office functions, payment arrangements, administrative procedures, and information systems (Government of Japan, 2004). Prior work suggests that such organizational restructuring can generate adjustment costs and administrative confusion even before formal implementation, potentially leading to declines in public-sector performance (Andrews and Boyne, 2012; Hirota et al., 2022). For tax administration, this

transition was particularly consequential. Municipalities had to integrate taxpayer records, payment histories, delinquency files, collection procedures, and tax information systems, all of which are essential for timely collection. In some cases, previous-year data could not be fully migrated before the new system began operating, requiring municipalities to use old and new systems simultaneously during the transition (Fujimoto, 2006). We therefore do not interpret the year immediately preceding the legal merger as a clean pre-treatment period. Instead, event time -1 is best understood as a transition period in which merger-related organizational restructuring was already underway.

This transition period implies that municipal mergers may affect fiscal capacity through two opposing channels. The first is organizational disruption. As constituent municipalities prepare for consolidation, previously separate tax offices must harmonize records, systems, personnel assignments, and collection procedures. Such restructuring can weaken organization-specific routines and expertise embedded in pre-merger tax offices, potentially delaying the reconciliation of payment records, the identification of delinquent accounts, the issuance of reminders, and the implementation of enforcement procedures. This channel is consistent with prior work showing that administrative consolidation and structural reorganization can generate transition frictions, adjustment costs, and performance losses, and that the way administrative functions are integrated can shape post-merger inefficiency (Andrews and Boyne, 2012; Nakazawa, 2014; Hirota et al., 2022).

The second channel is cost reduction. Once the legal merger takes effect, the new municipality can operate tax administration with fewer duplicated inputs, such as separate offices, personnel groups, service counters, information systems, vendor contracts, and administrative procedures. This scale-economy rationale is central to the case for municipal consolidation and is consistent with evidence that municipal mergers can reduce local government expenditures (Hirota and Yunoue, 2013; Reingewertz, 2012; Blesse and Baskaran, 2016; Allers and Geertsema, 2016). Thus, municipal mergers may weaken the collection performance of fiscal capacity during organizational transition while reducing the administrative resources required to collect taxes after formal consolidation.

2.2 Municipal Taxes in Japan

Municipal taxes are a central source of revenue for Japanese municipalities. In the fiscal year 2020 settlement, total municipal tax revenue amounted to 22.457 trillion yen (approximately 140.4 billion U.S. dollars).⁴ Two tax categories accounted for most of this revenue: municipal resident

⁴U.S. dollar equivalents are calculated using an exchange rate of 160 yen per U.S. dollar.

taxes generated 10.239 trillion yen (approximately 64.0 billion U.S. dollars), or 45.6 percent of total municipal tax revenue, while property taxes generated 9.380 trillion yen (approximately 58.6 billion U.S. dollars), or 41.8 percent. Together, these two taxes accounted for 87.4 percent of municipal tax revenue ([Ministry of Internal Affairs and Communications, 2022](#)). Other municipal taxes were much smaller: city planning taxes accounted for 1.330 trillion yen (approximately 8.3 billion U.S. dollars); municipal tobacco taxes for 0.817 trillion yen (approximately 5.1 billion U.S. dollars); and other taxes for 0.691 trillion yen (approximately 4.3 billion U.S. dollars). These figures show that municipal resident taxes and property taxes are not only administratively important but also quantitatively central to municipal fiscal capacity. This motivates our analysis of overall ordinary tax collection rates as well as separate collection rates for these two major tax items.

The two taxes differ in the type of information and administrative routines they require. Municipal resident taxes are closely tied to annually updated information on residents, income, and employment. For individuals, the tax is generally assessed by the municipality in which the taxpayer resides as of January 1, based on income earned in the previous year. Also, municipalities must maintain resident records, incorporate income information, process employer-reported information, update payment records, and manage delinquent accounts. Resident tax administration is thus relatively information-intensive

Property taxes, by contrast, are assessed on land, houses, and depreciable assets owned as of January 1. Because the underlying tax base is geographically fixed, the set of taxable assets is more stable than the resident tax base. Property tax administration still requires municipalities to maintain property registers, update assessed values, issue tax notices, process payments, and manage delinquent accounts. However, relative to municipal resident taxes, it relies less on annually changing information on residence, income, and employment.

Local tax collection also requires a sequence of legally regulated and time-sensitive tasks that extends beyond assessment and billing. After tax liabilities are assessed, municipalities issue tax notices, confirm payments, reconcile payment records, and identify delinquent accounts. When taxes remain unpaid after the due date, they issue reminders and demand notices, investigate assets, arrange payment schedules when appropriate, initiate attachment procedures when necessary, and process suspension or write-off procedures for claims deemed uncollectible ([Japan Center for Cities, 2012](#)). Delays at any stage can reduce current-year collection rates even if assessed liabilities themselves do not change.

These institutional features clarify why municipal mergers may affect the collection margin of fiscal capacity. Before and after a legal merger, constituent municipalities must integrate taxpayer records, reconcile payment histories and delinquency files, standardize tax information systems, and harmonize collection procedures. Furthermore, staff may be reassigned, former municipal offices may lose autonomy over collection decisions, and previously separate practices for reminders, consultations, and enforcement may need to be unified. Because current-year collection depends on timely execution and locally accumulated administrative expertise, such reorganization can disrupt embedded routines and temporarily weaken municipalities' ability to convert assessed liabilities into actual revenues within the fiscal year.

The extent of this disruption is likely to vary with the structure of the merger. In an asymmetric merger, the procedures of a dominant municipality may provide a clear administrative template for the new municipality. By contrast, when similarly sized municipalities merge, there may be no obvious standard to adopt, requiring more negotiation and adjustment across offices. Likewise, mergers involving many constituent municipalities require the integration of more personnel groups, records, systems, and local practices. These forms of organizational complexity provide a reason to expect larger declines in collection performance when routine harmonization is more difficult.

3 Data

We construct a municipality-level panel dataset for Japan covering the period from 2000 to 2018.⁵ The starting year is chosen to capture the main wave of the Great Heisei municipal mergers. Although the institutional process began in 1999, merger activity was concentrated in the early and mid-2000s, with the largest number of mergers occurring around 2005. We end the sample in 2018 to avoid contamination from the COVID-19 shock, which affected economic and administrative conditions

⁵We construct the municipality-level panel by combining several administrative data sources. Data on tax liabilities, tax revenues, tax collection rates, and tax administrative expenditures are obtained from the Survey on Local Public Finance Situations (Chiho Zaisei Jokyo Chosa) and the Final Accounts of Municipal Governments (Shichoson-betsu Kessan Jokyo Shirabe), compiled by the Ministry of Internal Affairs and Communications. Demographic variables, including population, migration, and age composition, are taken from the Survey on Population, Population Change, and the Number of Households Based on the Basic Resident Register (Jumin Kihon Daicho ni Motozuku Jinko, Jinko Dotai oyobi Setaisu). Data on the number of municipal officials are obtained from the Local Public Employee Staffing Management Survey (Chiho Kokyo Dantai Teiin Kanri Chosa), also provided by the Ministry of Internal Affairs and Communications. To construct consistent municipality-level units over time and to identify municipal merger histories, we use the municipality converter data provided by [Kondo, 2019](#), which account for changes in municipal boundaries associated with municipal mergers.

toward the end of fiscal year 2019. Because our object of interest is municipal consolidation, we construct the panel using the boundaries of future merged municipalities. For municipalities that had not yet merged, we aggregate all variables to the boundaries of the municipality that would exist after the merger. Thus, we compare fiscal outcomes within a consistent administrative unit before and after consolidation, rather than mechanically changing the unit of observation at the time of merger. We exclude municipalities involved in two or more mergers because the relevant treatment timing cannot be defined unambiguously. We also exclude Tokyo’s 23 special wards, which operate under a distinct local tax system.⁶

3.1 Outcome Variables

Our analysis focuses on three sets of outcome variables: tax collection rates, tax administrative costs, and tax revenue relative to tax administrative costs. These outcomes allow us to examine both the performance and the cost side of local tax administration.

The first outcome is the tax collection rate. This variable measures the share of taxes due in a given fiscal year that is actually collected as revenue within the same fiscal year. Formally, for municipality i in year y , we define the tax collection rate as

$$\text{Tax Collection Rate}_{i,y} = \frac{\text{Current-Year Tax Revenue}_{i,y}}{\text{Current-Year Tax Liabilities}_{i,y}}.$$

This measure captures the collection dimension of fiscal capacity. Conditional on the tax liabilities already assessed by the municipality, it measures how effectively the local government converts those liabilities into actual revenues. A decline in this variable indicates that a larger share of assessed taxes remains unpaid within the fiscal year. In addition to the overall municipal tax collection rate, we examine collection rates separately for the two largest municipal tax items: municipal resident taxes and property taxes. These two categories account for nearly 80 percent of municipal tax revenues, making them central to local fiscal capacity.

The second outcome is tax administrative costs. This variable captures the resources used by municipalities to administer and collect local taxes. It includes personnel costs and other administrative expenses associated with tax administration. Personnel costs account for approximately 70 percent of total tax administrative costs, reflecting the labor-intensive nature of tax collection, including

⁶For example, within Tokyo’s 23 special wards, property taxes are levied by the Tokyo Metropolitan Government rather than by each ward.

billing, payment confirmation, delinquency management, taxpayer consultation, and enforcement procedures. We also decompose tax administrative costs into personnel costs and supplies and services costs. Personnel costs are directly related to the number and allocation of tax officials. Supplies and services costs include operating expenses such as consumables, travel expenses, and system-related expenditures. We pay particular attention to this category because it provides a useful proxy for non-personnel inputs in tax administration, including tax information systems and related administrative infrastructure. This decomposition allows us to examine whether cost reductions arise from staff consolidation, reductions in non-personnel inputs, or both.

The third outcome is tax revenue relative to tax administrative costs. We define this measure as

$$\text{Tax Revenue per Administrative Cost}_{i,y} = \frac{\text{Current-Year Tax Revenue}_{i,y}}{\text{Tax Administrative Costs}_{i,y}}.$$

This variable captures the cost-effectiveness of tax administration. A higher value means that the municipality collects more tax revenue for each yen spent on tax administration. This measure is important because municipal mergers may simultaneously reduce collection rates and lower administrative costs. By examining tax revenue relative to administrative costs, we can assess whether the cost savings from consolidation outweigh any decline in collection performance.

3.2 Treatment Variable

The treatment variable is based on municipal mergers during the sample period. A municipality is defined as treated if it experienced a municipal merger between 2000 and 2018. Because our empirical strategy relies on a well-defined treatment timing, we restrict the treated sample to municipalities that experienced exactly one merger during the sample period. For municipalities that eventually merge, we assign the treatment year as the year in which the legal merger takes effect.

Figure 2 shows the geographical distribution of municipalities that experienced exactly one merger during the sample period. These municipalities are widely distributed across Japan, indicating that the Great Heisei municipal mergers were not confined to a small number of regions. This broad geographic coverage is useful for the empirical analysis because treated municipalities are observed in many prefectures and local contexts. At the same time, the substantial spatial variation in merger exposure allows us to compare merging and non-merging municipalities within the same prefecture-year environment in the event-study design.

Figure 2: Geographic Distribution of Municipalities that Experienced Exactly One Merger



Note: Municipalities shaded in blue are those that experienced exactly one municipal merger during the sample period.

3.3 Covariates

We use a set of demographic and economic covariates to describe municipalities and to examine the robustness of the main results. The demographic covariates include population size, the number of in-migrants, the number of out-migrants, the share of the population under age 15, and the share of the population aged 65 or older. These variables capture differences in population scale and age structure across municipalities. We also use covariates that capture local economic conditions and the tax base: the labor force population, the number of employed persons, and taxable income.⁷ They describe the size and economic activity of the local population, and may be related to the amount and composition of local tax liabilities. We examine the role of these time-varying covariates in the robustness analysis in Section 5.4.

Table 1 reports summary statistics for the outcome variables and covariates in 2000, separately for the treatment and control groups. Because variables for municipalities that later merged are aggregated

⁷These variables describe resident characteristics and local economic conditions; they are not measures of administrative labor input.

to the boundaries of the future merged municipality, the treatment group should be interpreted as consolidated municipal units rather than individual pre-merger municipalities. With this construction, the treatment and control groups are broadly similar across many baseline characteristics, including age composition, labor force population, employment, and taxable income. This balance suggests that aggregation to future merged boundaries produces municipal units that are comparable to non-merging municipalities along many observable dimensions. The main exception is population size: future merged municipalities are larger on average than control municipalities, reflecting the fact that consolidation mechanically combines multiple pre-merger municipalities into a larger administrative unit. If this population difference is associated with different pre-existing demographic trends, it could affect the interpretation of the event-study estimates. We return to this issue in Section 7, where we examine population and migration patterns around municipal mergers.

Table 1: Summary Statistics by Treatment Status

Variable	Treatment group		Control group	
	Mean	SD	Mean	SD
<i>Outcome variables</i>				
Ordinary tax collection rate	0.98	0.012	0.98	0.019
Municipal resident tax collection rate	0.99	0.0072	0.98	0.0099
Property tax collection rate	0.97	0.018	0.97	0.028
Tax administrative costs	387993	345000	290275	1134482
Tax administrative costs per capita	6.7	2	7.2	3.4
Personnel costs on tax administration per capita	4.7	1.5	5.2	2.7
Supplies and services on tax administration per capita	1.1	0.76	1.2	1
Ordinary tax revenue per tax administrative cost	17	9	19	12
<i>Covariates</i>				
Population size	71598	84511	56097	183810
Percentage of population under age 15	0.14	0.016	0.14	0.023
Percentage of population aged 65 or older	0.24	0.055	0.22	0.071
Labor force population	37273	44137	29191	96926
Number of employed persons	35691	42057	27711	91390
Taxable income	92424	127326	86072	314189

Note: This table reports means and standard deviations by treatment status. The treatment group consists of municipalities that experienced exactly one merger during the sample period, aggregated to future merged-municipality boundaries. Monetary variables are reported in thousands of yen, and per-capita cost variables divide these thousand-yen amounts by population. As of June 19, 2026, 1 U.S. dollar was approximately 160 yen.

4 Empirical Strategy

We estimate the dynamic effects of municipal mergers using an event-study based on a difference-in-differences design. This approach allows us to examine how fiscal outcomes evolve before and after a merger, and to distinguish short-run effects during the reorganization period from longer-run effects after formal consolidation. This distinction is central to our analysis because municipal mergers may affect tax administration through multiple channels. Organizational restructuring may disrupt tax collection routines before the legal merger takes effect, while scale effects in administrative costs may materialize only after municipalities formally consolidate offices, personnel, and systems.

Let i index municipalities, p prefectures, and y calendar years. Event time t is defined as calendar year y minus the merger year of municipality i . We estimate the following specification:

$$Y_{i,p,y} = \alpha_i + \lambda_{p,y} + \sum_{-6, \tau \neq -2}^{10} \beta_{\tau} \text{Merger}_{i,p,t}^{\tau} + \varepsilon_{i,p,y} \quad (1)$$

where $Y_{i,p,y}$ denotes the outcome of interest for municipality i in prefecture p and year y . All outcomes are transformed into logarithms. The variable $\text{Merger}_{i,p,t}^{\tau}$ is an indicator equal to one if event time t in municipality i equals τ in year y , and zero otherwise. The coefficients of interest are β_{τ} , which trace the dynamic path of the outcome relative to the omitted reference period.

We use event time -2 as the reference period. Our hypothesis is that merger-related organizational restructuring begins before the legal merger, and that the disruption of tax collection routines may already affect fiscal outcomes in event time -1 . Therefore, we treat event time -1 as part of the transition period rather than as a pure pre-treatment year. The coefficients β_{τ} should be interpreted as changes relative to two years before the merger, immediately before the onset of the reorganization period.

We include event-time indicators from $\tau = -6$ to $\tau = 10$, with event times outside this range binned at the endpoints. In the figures, we report pre-merger coefficients up to event time -5 . This choice reflects the structure of the data: the sample begins in 2000, and municipal mergers are most concentrated in 2005, so event time -5 is the earliest pre-merger period that can be observed for the main merger cohort. Standard errors are clustered at the municipality level.

The specification includes municipality fixed effects, α_i , which absorb time-invariant differences across municipalities, such as geography, historical administrative capacity, and persistent local characteristics. It also includes prefecture-by-year fixed effects, $\lambda_{p,y}$, which control for time-varying shocks

common to municipalities within the same prefecture. These fixed effects account for prefecture-specific policy changes, economic conditions, and administrative environments in each year, and effectively compare municipalities that merge with other municipalities in the same prefecture and year.

5 Results

5.1 Assessing Changes in Assessed Tax Amounts

Before examining the effects of municipal mergers on tax collection performance, we first investigate whether mergers affected the amount of taxes assessed by municipalities. This exercise is important because our main outcome, the tax collection rate, captures the extent to which municipalities collect taxes out of already assessed liabilities. If mergers changed the tax base, tax rates, assessment practices, or municipalities' ability to identify taxable liabilities, changes in collection rates could reflect changes in assessed tax amounts rather than changes in collection performance.

Figure 3 presents the point estimates of β_τ from equation (1) for assessed tax amounts, with 95% confidence intervals. The estimates show no clear evidence of a systematic change in assessed taxes around the timing of municipal mergers. In particular, there is no discrete break either in the year before the legal merger, when merger-related organizational restructuring begins, or in the merger year itself. Appendix Figure A.1 further examines assessed tax amounts separately for the two largest municipal tax categories: municipal resident taxes and property taxes.⁸ The results are similar to those for total assessed taxes. We find no clear evidence that mergers changed assessed resident taxes or assessed property taxes around the merger period.

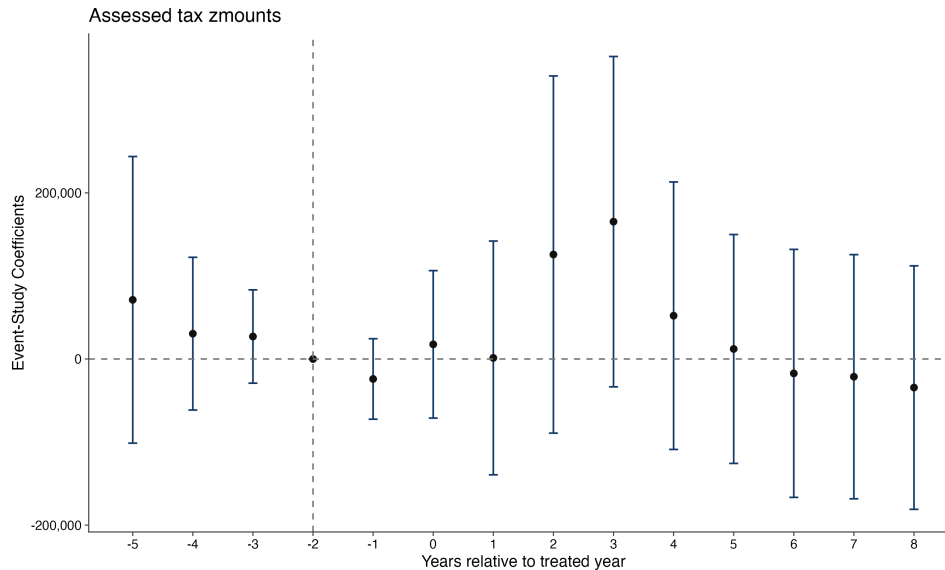
The tax-item results are informative about the nature of the merger shock. The absence of a change in assessed resident taxes suggests that mergers did not generate large changes in the resident tax base. Similarly, the absence of a change in assessed property taxes is consistent with the fact that the underlying property tax base is geographically fixed and shows that mergers did not substantially change assessed property values. More broadly, these results suggest that the decision to merge had limited effects on local tax outcomes outside the collection performance.

Taken together, these findings indicate that municipal mergers did not meaningfully affect assessed tax liabilities. Therefore, the subsequent analysis can be interpreted as capturing changes in

⁸Municipal resident taxes and property taxes together exceed 80 percent of municipal tax revenues.

municipalities' ability to collect taxes from a given assessed liabilities, rather than changes in the underlying tax base, tax policy, or assessment capacity. In other words, the results below speak to the collection dimension of fiscal capacity, how effectively municipalities convert assessed tax obligations into current-year tax revenues.

Figure 3: Event-Study Estimates: Effects of Municipal Mergers on Assessed Tax Amounts



Note: This figure reports event-study estimates of the effects of municipal mergers on assessed tax amounts. Event time -2 is the omitted reference period. Dots represent point estimates, and bars show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

5.2 Fiscal Capacity

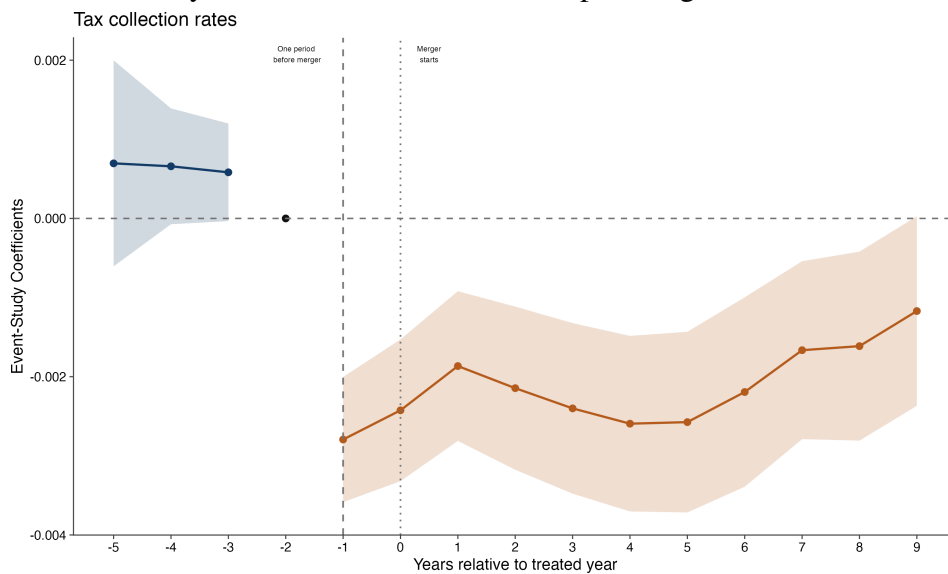
We turn to our main outcome, tax collection rates. This outcome captures the collection dimension of fiscal capacity. Conditional on the amount of taxes assessed, it measures how municipalities convert tax obligations into actual revenues within the fiscal year. Municipal mergers may weaken this form of fiscal capacity by disrupting the accumulated organizational resources and routines that support tax collection. Tax collection requires more than routine billing. Municipal tax offices must reconcile payment records, identify delinquent taxpayers, issue reminders and demand notices, conduct asset investigations, respond to taxpayer consultations, and, when necessary, initiate attachment procedures.

Mergers can interfere with these processes through organizational restructuring. Before and after consolidation, municipalities must integrate tax records, reassign personnel, standardize procedures, and harmonize collection practices that had previously been embedded in separate municipal offices. These adjustments may delay or disrupt the execution of ordinary collection procedures.

Figure 4 presents the event-study estimates from equation (1) for tax collection rates. The estimates

reveal a clear decline beginning in event time -1, before the legal merger takes effect. This timing is informative. Because the decline emerges during the period of merger-related organizational restructuring, rather than only after the formal consolidation, it is consistent with the disruption of tax collection routines during the transition process. In addition, the magnitude of this decline is small but non-negligible. The decline in tax collection rates is about 0.2–0.3 percent, which corresponds to a decline of roughly 0.2 percentage points in the collection rate in Table 1. Given a baseline assessed tax amount of about 8 billion yen (50 million U.S. dollars), a 0.2 percentage point decline implies a back-of-the-envelope revenue loss of roughly 16 million yen (100,000 U.S. dollars) per municipality.

Figure 4: Event-Study Estimates: Effects of Municipal Mergers on Tax Collection Rates



Note: This figure reports event-study estimates of the effects of municipal mergers on tax collection rates. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1, when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0, when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure 5 further decomposes the effect on collection rates by major tax item, focusing on municipal resident taxes and property taxes. The same broad pattern appears for both tax categories: collection rates decline around the merger period and remain below the pre-merger reference period for several years.

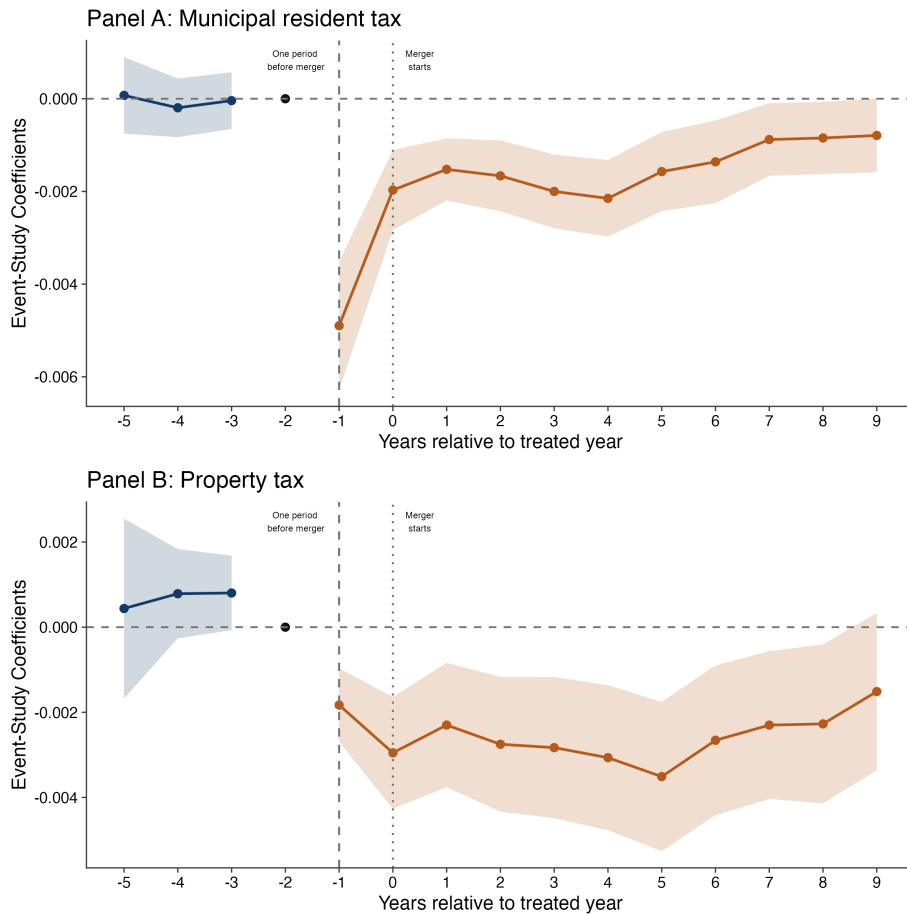
The decline is particularly pronounced for municipal resident taxes. The estimated effect falls sharply already in event time -1, suggesting that this tax item was especially vulnerable to the initial burden of merger-related organizational restructuring. This pattern is consistent with the nature of resident tax administration. Compared with property taxes, resident taxes require municipalities to

update and reconcile more fluid information on residents, income, employment status, and payment records. As a result, disruptions in personnel assignment, data integration, and office-level routines are more likely to translate quickly into lower current-year collection rates.

The timing of the resident tax decline is also informative. The large drop in event time -1 points to the importance of the initial reorganization burden before the legal merger, such as staff reassignment, office restructuring, and the integration of tax records across municipalities. The persistence of the decline after the merger suggests that the disruption was not limited to a one-year transition. Instead, municipalities may have needed several years to standardize collection procedures, reconcile different office practices, and rebuild effective routines for delinquency management.

Taken together, Figures 4 and 5 show that municipal mergers reduced municipalities' ability to collect taxes within the fiscal year, even though assessed tax liabilities did not change systematically around the merger.

Figure 5: Event-Study Estimates: Effects of Municipal Mergers on Tax Collection Rates by Tax Item



Note: This figure reports event-study estimates of the effects of municipal mergers on tax collection rates. Panel A reports estimates for municipal resident tax collection rates, and Panel B reports estimates for property tax collection rates. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

5.2.1 Heterogeneity by Merger Structure

We next examine whether the decline in tax collection rates varies with the organizational structure of the merger. If the decline in collection rates reflects the disruption of tax collection routines, the effect should be larger when post-merger administrative coordination is more difficult. Therefore, we split the sample by three measures of merger complexity: population disparities among constituent municipalities, population dispersion among constituent municipalities, and the number of constituent municipalities.

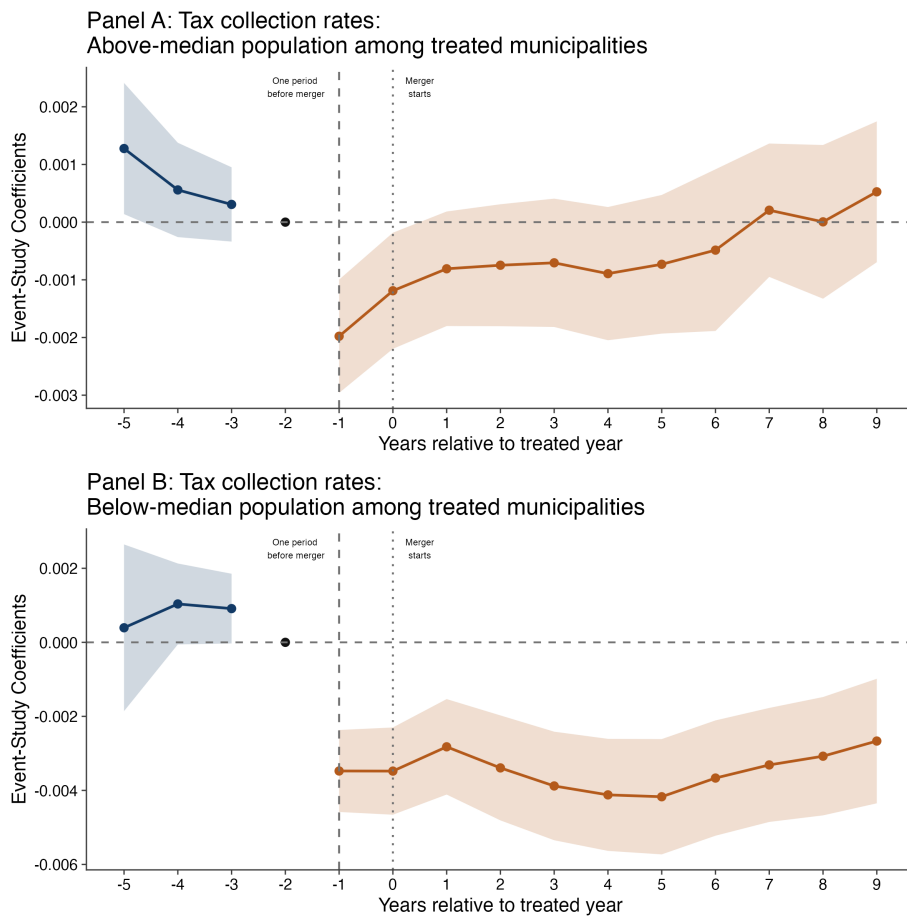
Figures 6 and 7 examine heterogeneity by the relative size structure of the merging municipalities. Figure 6 splits the sample by the difference between the largest and smallest constituent municipal-

ities in terms of population. Panel A reports estimates for mergers with above-median population disparities, while Panel B reports estimates for mergers with below-median disparities. Figure 7 uses a related measure: the variance of population across constituent municipalities within the merged area. Again, Panel A shows mergers with above-median population dispersion, and Panel B shows mergers with below-median dispersion.

These two measures capture the degree of asymmetry among merging municipalities. In more asymmetric mergers, a central municipality is more likely to be clearly defined, and post-merger tax administration may be organized around the practices, personnel, and systems of that dominant municipality. By contrast, in mergers among municipalities of similar size, there may be no obvious administrative center. In such cases, municipalities may need to negotiate and harmonize multiple pre-existing routines, rather than simply extending the procedures of one dominant office. This can make the standardization of tax records, collection procedures, personnel assignments, and delinquency management more difficult after the merger.

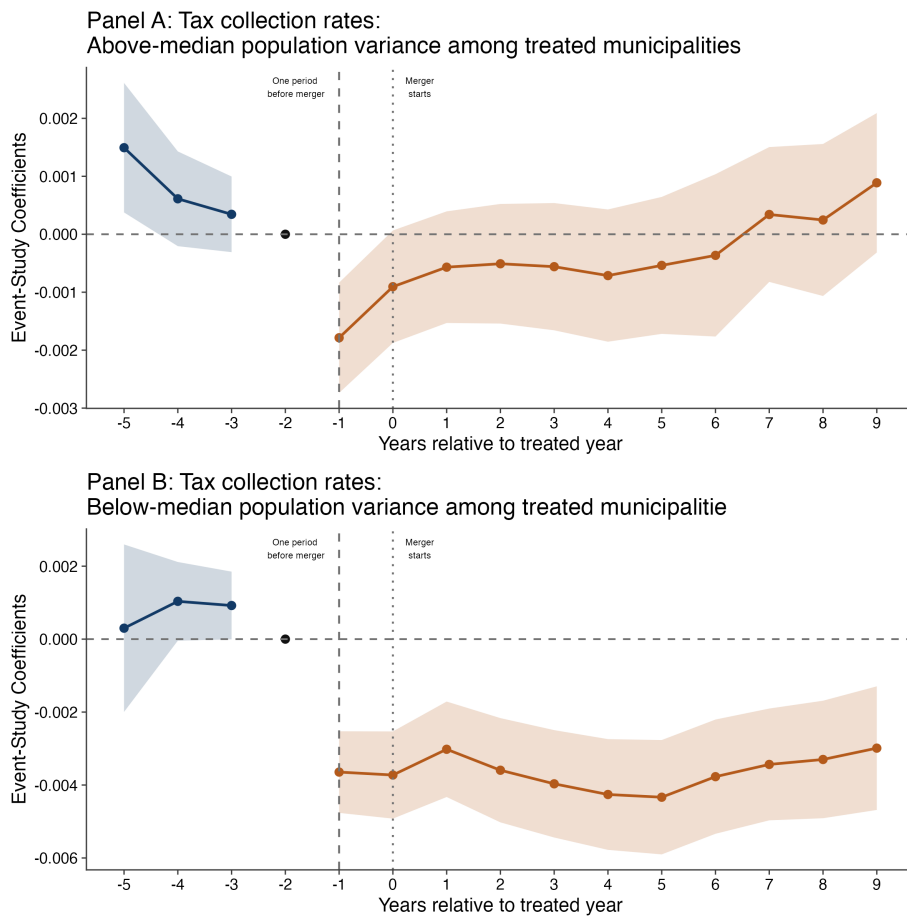
The estimates are consistent with this interpretation. In both Figures 6 and 7, collection rates decline around the merger period in both groups, including the year before the legal merger. This common decline is consistent with an initial reorganization burden that arises even before the formal consolidation takes effect. However, the post-merger decline is more pronounced and persistent in Panel B, where population disparities or population dispersion are below the median. These are precisely the mergers in which constituent municipalities are more similar in size and, therefore, where post-merger coordination and routine harmonization are likely to be more difficult.

Figure 6: Event-Study Estimates: Heterogeneous Effects of Municipal Mergers on Tax Collection Rates by Population Disparities among Municipalities



Note: This figure reports event-study estimates of the heterogeneous effects of municipal mergers on tax collection rates by population disparities among constituent municipalities. Panel A reports estimates for mergers with above-median population disparities, and Panel B reports estimates for mergers with below-median population disparities. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure 7: Event-Study Estimates: Heterogeneous Effects of Municipal Mergers on Tax Collection Rates by Population Dispersion among Municipalities



Note: This figure reports event-study estimates of the heterogeneous effects of municipal mergers on tax collection rates by population dispersion among constituent municipalities. Panel A reports estimates for mergers with above-median population dispersion, and Panel B reports estimates for mergers with below-median population dispersion. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

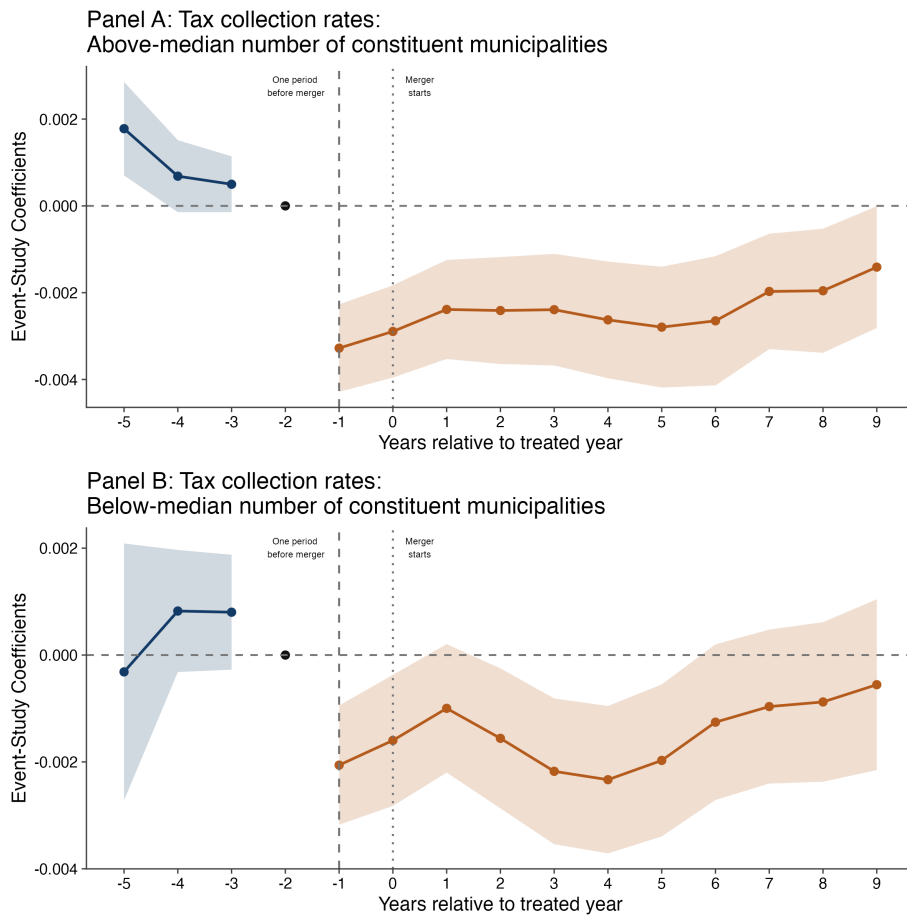
Figure 8 examines a different dimension of organizational complexity: the number of constituent municipalities involved in the merger. Panel A reports estimates for mergers with an above-median number of constituent municipalities, while Panel B reports estimates for mergers with a below-median number of constituent municipalities.⁹ The prediction is different from that for population asymmetry. Holding other features constant, mergers involving more municipalities should require greater coordination because more tax offices, information systems, personnel groups, and local

⁹In our sample, mergers with an above-median number of constituent municipalities are those involving three or more municipalities.

administrative practices must be integrated.

The results in Figure 8 are consistent with this prediction. Collection rates decline in both panels around the merger period, again suggesting that merger-related reorganization imposes an immediate burden on tax administration. The decline is larger and more persistent in Panel A, where the number of constituent municipalities is above the median. This pattern suggests that the administrative cost of integrating multiple tax offices increases with the number of municipalities involved in the merger.

Figure 8: Event-Study Estimates: Heterogeneous Effects of Municipal Mergers on Tax Collection Rates by Number of Constituent Municipalities



Note: This figure reports event-study estimates of the heterogeneous effects of municipal mergers on tax collection rates by the number of constituent municipalities. Panel A reports estimates for mergers with an above-median number of constituent municipalities, and Panel B reports estimates for mergers with a below-median number of constituent municipalities. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Taken together, Figures 6–8 provide further evidence in support of the routine-disruption mech-

anism. The decline in tax collection rates is not uniform across all mergers. Instead, it is larger in merger structures where post-merger coordination is likely to be more difficult: mergers among similarly sized municipalities and mergers involving a larger number of constituent municipalities. Moreover, the fact that collection rates fall already in event time -1 across these different types of mergers reinforces the interpretation that the initial burden of organizational restructuring begins before the legal merger. The persistence of the decline after the merger further suggests that rebuilding standardized and effective tax collection routines takes time.

5.3 Scale Effects

In this subsection, we examine the cost side of tax administration. Municipal mergers may have scale effects, including both economies of scale and economies of scope. Such scale effects are particularly relevant for tax administration because many inputs involve substantial fixed costs. After consolidation, a merged municipality may be able to collect a given amount of tax revenue with fewer separate tax offices, personnel groups, information systems, service counters, training programs, and administrative procedures. In particular, tax information systems require installation costs, maintenance fees, software licenses, form design, database management, cybersecurity measures, backup systems, updates in response to legal reforms, and contracts with external vendors. These costs need not increase proportionally with the number of taxpayers or the amount of tax revenue. As a result, consolidating municipalities may reduce the average cost of tax administration by spreading these fixed inputs over a larger administrative unit and by eliminating duplicate systems and procedures.

Figure 9 presents event-study estimates from equation (1) for tax administrative costs. Panel A uses total tax administrative costs as the outcome, while Panel B uses tax administrative costs per capita. Both panels show a similar pattern. There is little evidence of a change before the legal merger. In addition, the estimate at event time -1 is close to the pre-merger estimates for event times -5 to -3, suggesting that tax administrative costs did not begin to decline during the pre-merger organizational restructuring period. The decline appears only after the merger takes effect and becomes larger over time.¹⁰

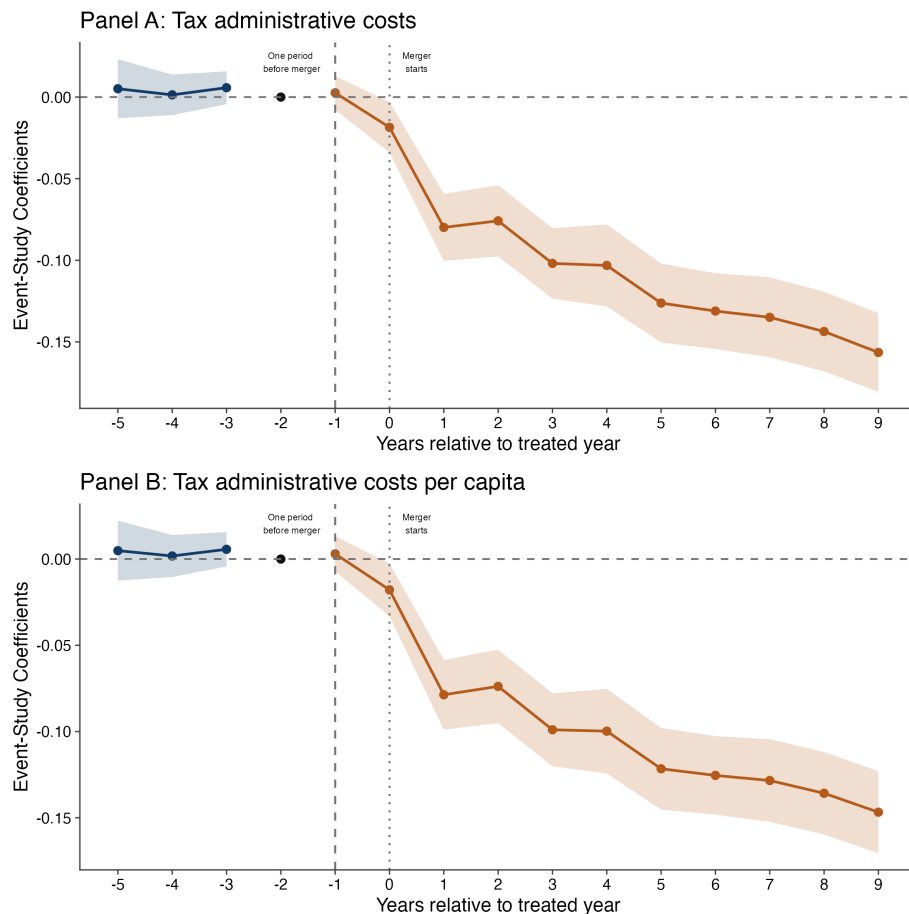
This timing is informative. Unlike the decline in tax collection rates, which begins in event time -1, the reduction in tax administrative costs occurs after formal consolidation. This pattern is consistent with a scale-effects interpretation: cost savings arise when municipalities actually combine offices,

¹⁰At the event time with the largest estimated decline, the reduction is approximately 15 percent.

systems, personnel, and administrative operations, rather than during the preparatory stage before the legal merger.

The magnitude and persistence of the post-merger decline suggest that consolidation generated substantial cost savings in tax administration. These findings also show that municipal mergers weakened the collection dimension of fiscal capacity, but at the same time improved the cost efficiency of tax administration.

Figure 9: Event-Study Estimates: Effects of Municipal Mergers on Tax Administrative Costs



Note: This figure reports event-study estimates of the effects of municipal mergers on tax administrative costs. Panel A reports estimates for total tax administrative costs, and Panel B reports estimates for tax administrative costs per capita. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

5.3.1 Number of Tax Officials

One potential channel behind the cost savings documented in Figure 9 is a reduction in personnel assigned to tax administration. If municipal mergers generate returns to scale, merged municipalities

may be able to operate tax administration with fewer tax officials by consolidating offices, reallocating staff, and eliminating duplicate administrative functions.

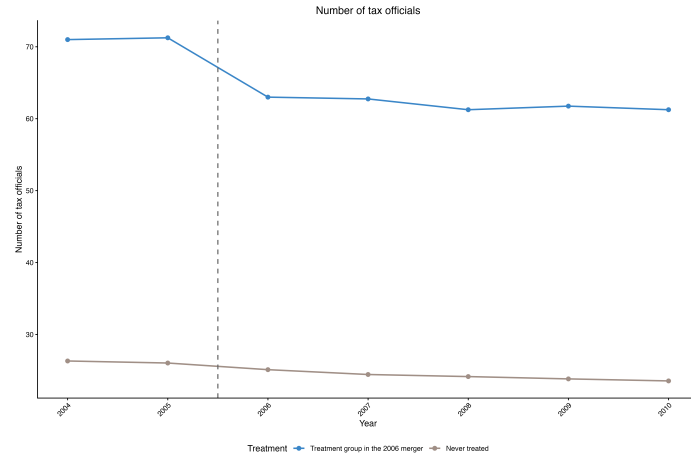
We provide suggestive evidence on this channel using data on the number of tax officials. Because these data are available only from 2004 onward, it is difficult to examine long pre-trends for all merger cohorts. We therefore first focus on municipalities that merged in 2006, which allows us to observe at least two years before the merger and compare their trends with those of never-treated municipalities.¹¹

Figure 10 plots the average number of tax officials for municipalities that merged in 2006 and for never-treated municipalities. Before the merger, the two groups exhibit broadly similar trends. After 2006, however, the number of tax officials declines among municipalities that merged, while the trend for never-treated municipalities remains relatively stable. This pattern is consistent with the idea that mergers reduced the personnel input required for tax administration. Figure 11 also presents event-study estimates for the number of tax officials. Because of the limited time coverage of the personnel data, this specification uses event time -2 as the reference period and does not allow us to examine a long pre-treatment window. Nevertheless, the post-merger estimates show a decline in the number of tax officials relative to the year before the merger. This result provides additional suggestive evidence that personnel consolidation contributed to the decline in tax administrative costs.

These findings support the scale-effects interpretation of the cost results. While the evidence should be interpreted cautiously because of the limited availability of personnel data, the observed decline in tax officials indicates that municipal mergers reduced at least one important input into tax administration. In addition, collection rates, by contrast, fall already in event time -1 , suggesting that the decline reflects transition-related disruptions to records, procedures, and collection routines rather than only a reduction in labor inputs.

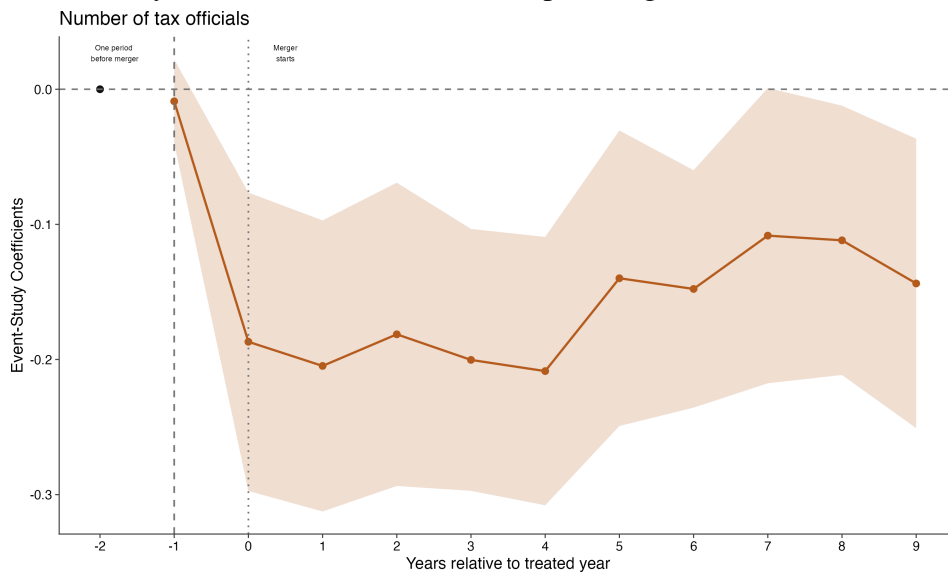
¹¹Since the Great Heisei mergers had largely subsided after 2007, the 2006 merger cohort is the latest cohort for which we can examine pre-merger trends while retaining a meaningful set of treated municipalities.

Figure 10: Trends in the Number of Tax Officials in the Merged Municipality in 2006



Note: This figure plots the average number of tax officials for municipalities that merged in 2006 and for never-treated municipalities

Figure 11: Event-Study Estimates: Effects of Municipal Mergers on the Number of Tax Officials



Note: This figure reports event-study estimates of the effects of municipal mergers on the number of tax officials. Because data on tax officials are available only from 2004 onward, the estimation uses event time -2 as the omitted reference period. The vertical solid line indicates event time 0, when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

5.3.2 Further Suggestive Evidence behind Scale Effects

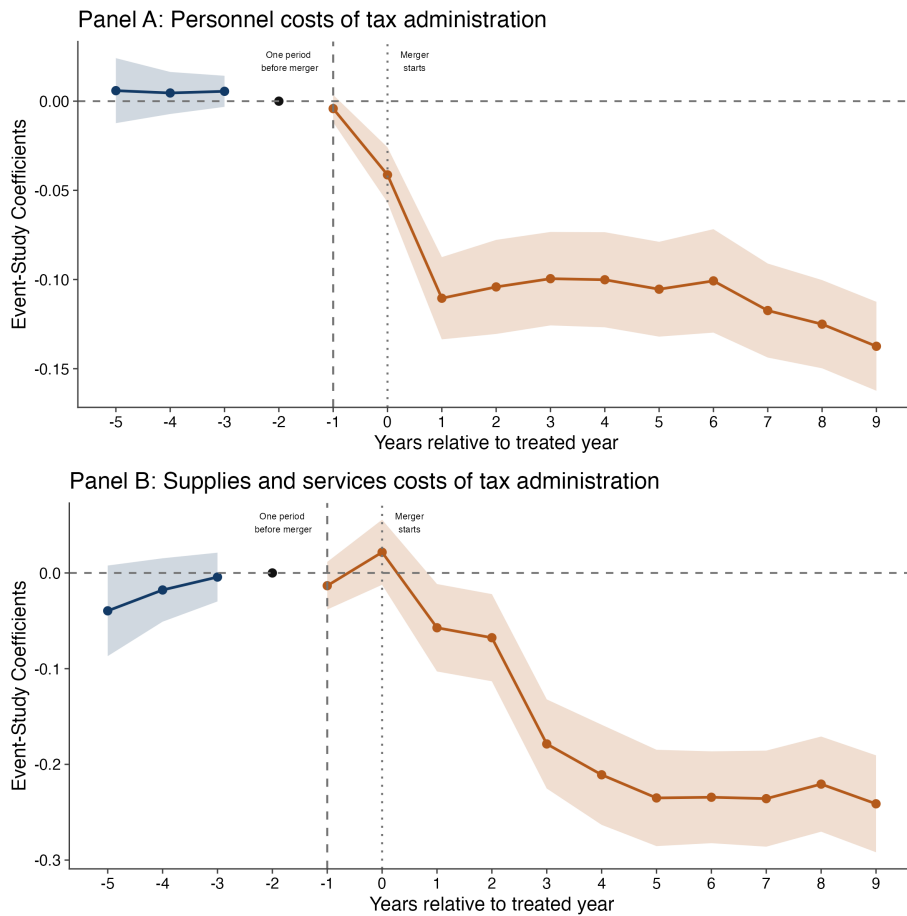
To further examine the sources of the cost reductions documented above, we decompose tax administrative costs into two cost items: personnel costs and supplies and services costs. Figure 12 presents event-study estimates for these outcomes. Panel A reports personnel costs for tax administration per

capita, while Panel B reports supplies and services costs for tax administration per capita. The former is closely related to the personnel adjustment documented in Figures 10 and 11. The latter includes operating expenses such as consumables, travel expenses, and system-related costs, and therefore provides additional suggestive evidence on whether consolidation reduced non-personnel inputs in tax administration, especially system-related costs.

Panel A shows a clear decline in personnel costs after municipal mergers. This pattern is consistent with the results in Figures 9, 10, and 11, which show declines in total tax administrative costs and in the number of tax officials. Panel B shows a different timing for supplies and services costs. Unlike personnel costs, supplies and services costs do not decline immediately after the merger. Instead, they increase in the first post-merger year and begin to decline only from around event time 2. This pattern suggests that non-personnel inputs may involve short-run adjustment costs. In particular, system-related expenses may temporarily rise when municipalities integrate databases, standardize tax administration systems, redesign forms, harmonize procedures, and adjust contracts with external vendors. These transition costs may initially offset the scale benefits from consolidation.

The contrast between Panels A and B is informative about the mechanism behind the cost savings. Personnel-related scale effects appear relatively soon after formal consolidation, consistent with staff reallocation and the reduction of duplicate administrative positions. By contrast, scale effects in supplies and services, including system-related costs, appear only with a delay. This delayed response suggests that the consolidation of tax administration systems requires an initial investment or adjustment period before cost savings materialize.

Figure 12: Event-Study Estimates: Effects of Municipal Mergers on Tax Administrative Costs by Cost Item



Note: This figure reports event-study estimates of the effects of municipal mergers on tax administrative costs by cost item. Panel A reports estimates for personnel costs on tax administration per capita, and Panel B reports estimates for supplies and services costs on tax administration per capita. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

5.4 Robustness

Covariates.— We first examine whether the main results are driven by observable time-varying municipal characteristics. Municipal mergers may coincide with demographic and economic changes that affect tax administration. Population size and age structure may influence the difficulty of updating resident records, identifying taxpayers, and managing payment histories, while labor-market conditions and taxable income may be related to the size and composition of the local tax base. To address this concern, we re-estimate the event-study specification by adding the following time-

varying covariates: population size, the number of in-migrants, the number of out-migrants, the share of the population under age 15, the share of the population aged 65 or older, the labor force population, the number of employed persons, and taxable income

Figure A.2 reports the results. Panel A shows the estimates for tax collection rates, and Panel B shows the estimates for tax administrative costs per capita. The patterns are very similar to those in the baseline specification. Tax collection rates decline around the merger period, while tax administrative costs per capita fall after the merger. Importantly, the timing of the effects remains unchanged: the decline in collection rates begins around the reorganization period, whereas the decline in administrative costs appears after formal consolidation. These results suggest that the main findings are unlikely to be driven by observable changes in demographic composition, employment, or taxable income that occur around municipal mergers.

Timing of Treatment.— We next address concerns related to staggered treatment timing in the conventional two-way fixed effects event-study estimator. The timing of municipal mergers varies across municipalities, generating a staggered adoption setting. In such designs, the TWFE estimator can be biased when treatment effects are heterogeneous across cohorts and over time, because already-treated municipalities may implicitly serve as controls for municipalities treated later (Goodman-Bacon, 2021). To mitigate this concern, Figure A.3 restricts the treated group to municipalities that merged in 2005, the year in which municipal mergers were most concentrated, and compares them with never-treated municipalities. Since all treated municipalities in this specification share the same treatment timing, the analysis avoids the staggered adoption comparisons that can generate negative weights. Panel A reports the results for tax collection rates, and Panel B reports the results for tax administrative costs per capita. The estimates remain close to the baseline results: tax collection rates decline around the merger period, while tax administrative costs per capita fall after the merger.

As a complementary approach, Figure A.4 applies the interaction-weighted event-study estimator of Sun and Abraham (2021). This estimator avoids contaminated comparisons by identifying dynamic treatment effects using a clean control group of municipalities that were never treated, while allowing treatment effects to vary by merger cohort and event time. Panel A shows the estimates for tax collection rates, and Panel B shows the estimates for tax administrative costs per capita. The results are again similar to the baseline estimates. Tax collection rates decline beginning around the merger-related reorganization period and remain below the reference period after consolidation, whereas tax administrative costs per capita decrease after the legal merger takes effect. These results indicate that

our main conclusions are robust to the potential bias of TWFE event-study designs with staggered treatment timing.

Other Comparisons.— Figure A.5 addresses the concern that the baseline estimates may be driven by differences in observable pre-merger characteristics between municipalities that later merged and never-treated municipalities. To construct a more comparable control group, we match each pre-merger municipality that was scheduled to be involved in a future merger to one never-treated municipality using nearest-neighbor matching based on the Mahalanobis distance. The matching variables are measured in 2000 and include the demographic and economic covariates used in Figure A.2, together with per-capita local tax revenue and per-capita total expenditure. We then re-estimate the event-study specification using this matched sample, which restricts the control group to municipalities that are more similar to the municipalities exposed to future consolidation. The estimates display the same qualitative pattern as the baseline results. Tax collection rates decline beginning in the transition period before the legal merger, while tax administrative costs fall only after formal consolidation. The results suggest that the main findings are not driven by observable differences between treated and never-treated municipalities in the pre-merger period.

Figure A.6 provides an additional comparison that addresses the concern that the baseline results may depend on using never-treated municipalities that are not plausible merger partners. Motivated by the idea of comparing actual mergers with hypothetical mergers, we first construct all possible pairs of adjacent never-treated municipalities and aggregate their 2000 pre-merger characteristics to the pair level. In addition to the covariates used in the previous matching exercise, we include the population gap between the larger and smaller municipality in each pair, so that the matching accounts not only for aggregate characteristics but also for the internal size asymmetry of a potential merger. We then match these hypothetical two-municipality mergers to actual two-municipality mergers, restricting the treated group to the mergers used in Panel B of Figure 8. This exercise compares actual consolidations with spatially contiguous never-treated pairs that could have formed similar merger units. The estimates display the same qualitative pattern as the main results. For tax collection rates, the results are very similar to Panel B of Figure 8. For tax administrative costs, the estimates also reproduce the baseline pattern, with costs falling after the legal merger. These findings suggest that the main conclusions are not driven by comparisons with geographically or organizationally less comparable never-treated municipalities, and remain evident when actual mergers are compared with matched hypothetical mergers formed from adjacent never-treated municipalities.

Sensitivity.— Finally, we assess the sensitivity of our estimates to violations of the parallel trends assumption using the HonestDiD approach proposed by [Rambachan and Roth \(2023\)](#). Rather than assuming that parallel trends hold exactly, this method asks how large post-treatment violations of parallel trends would need to be to overturn the conclusions. We use the pre-treatment coefficients from event times -5 to -3 to discipline the magnitude of possible violations. Because the post-treatment effects display dynamic patterns, we summarize the estimates by averaging event-study coefficients over three windows: event times -1 to 2, 3 to 5, and 6 to 9. [Table A.1](#) reports sensitivity intervals based on the relative-magnitude restriction, where the parameter \bar{M} allows post-treatment violations of parallel trends to be up to \bar{M} times the largest violation observed in the pre-treatment period. The results indicate that the short-run decline in tax collection rates is relatively robust, for the -1 to 2 window. By contrast, the results for tax administrative costs per capita are more stable across windows. Overall, the HonestDiD analysis suggests that our main conclusions are not solely driven by small deviations from parallel trends.

6 Cost-effectiveness

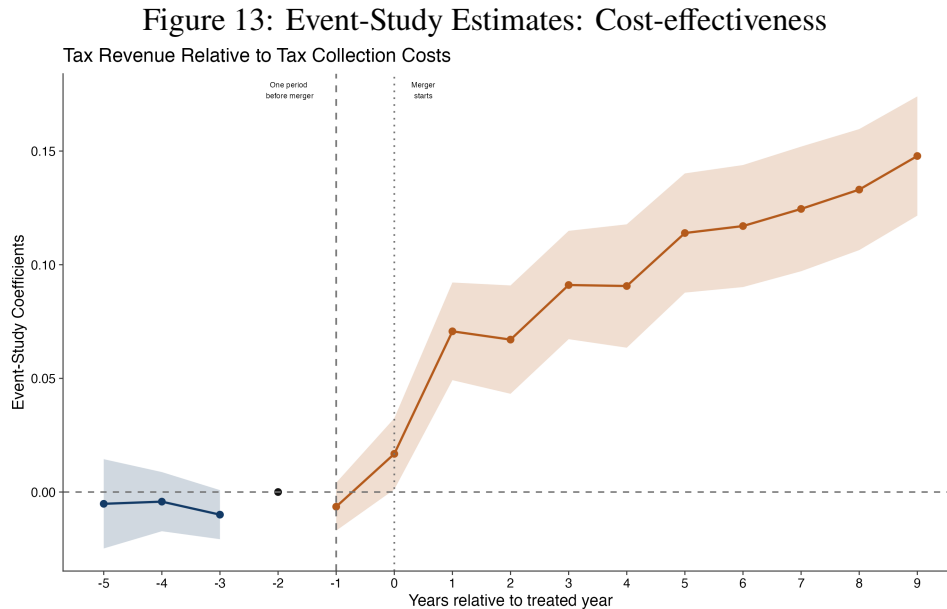
The previous results reveal two opposing effects of municipal mergers on tax administration. On the one hand, mergers reduced tax collection rates, suggesting a decline in the collection dimension of fiscal capacity. On the other hand, mergers substantially reduced tax administrative costs, consistent with scale effects in tax administration. These findings point to a potential trade-off between collection performance and cost efficiency. Whether this trade-off improves or worsens the overall effectiveness of tax administration depends on which force dominates.

To examine this issue, we consider the cost-effectiveness of tax administration. Fiscal capacity should not be evaluated only by whether governments collect all assessed liabilities, but also by how efficiently they convert administrative inputs into actual revenues ([Braccioli et al., 2024](#)). This perspective is particularly relevant in the context of local government consolidation, where the same organizational change may simultaneously weaken collection routines and reduce administrative costs. Following this logic, we examine tax revenue collected per unit of tax administrative cost.

[Figure 13](#) reports event-study estimates for tax revenue relative to tax administrative costs.¹² The estimates show a clear increase after municipal mergers. This pattern indicates that, although mergers

¹²[Figure A.7](#) shows the effects of the merger on tax revenue relative to tax administrative costs using the event-study estimator of [Sun and Abraham \(2021\)](#).

reduced collection rates, the reduction in tax administrative costs was large enough to more than offset the associated loss in collected revenue. In other words, merged municipalities collected more tax revenue per unit of administrative cost after consolidation. Figure 13 also highlights the importance of evaluating fiscal capacity from both performance and cost perspectives.



Note: This figure reports event-study estimates of the effects of municipal mergers on tax revenue relative to tax administrative costs. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

7 Discussion

State capacity.— Our results show that municipal mergers reshape local fiscal capacity through two opposing forces. First, mergers reduce the collection dimension of fiscal capacity: although assessed tax liabilities do not change systematically around mergers, current-year tax collection rates decline beginning in the year before the legal merger and remain lower for several years afterward. This pattern suggests that organizational restructuring disrupts the administrative routines required to convert assessed liabilities into actual revenues within the fiscal year. Second, mergers generate clear scale effects in tax administration. Tax administrative costs decline substantially after consolidation, and the reductions are consistent with decreases in personnel inputs and, with some delay, non-personnel administrative costs. Third, when these two forces are considered jointly, mergers increase

tax revenue collected per unit of tax administrative cost. This indicates that the cost savings from consolidation more than offset the revenue loss associated with lower collection rates. These findings have important implications for the study of state and fiscal capacity. Much empirical work proxies fiscal or state capacity using revenue-based indicators, such as tax revenue, tax revenue relative to GDP, or revenue collected relative to a potential tax base, as well as broader composite measures of state capacity (Besley and Persson, 2009; Besley et al., 2013; Hanson and Sigman, 2021; Braccioli et al., 2024). Our results suggest that this performance-based view should be complemented by a cost-effectiveness perspective. Fiscal capacity depends not only on how much revenue a government collects, but also on how many administrative resources are required to collect it. A government that raises a given amount of revenue with fewer administrative inputs possesses a more cost-effective form of fiscal capacity. In this sense, local government consolidation may improve the efficiency of fiscal capacity even when it weakens the operational performance of tax collection.

Tax collection rates.— Our measure of tax collection rates is closely related to the concept of the tax gap, but it captures only a specific component of it. The tax gap generally refers to the difference between true tax liabilities and taxes paid voluntarily and on time. The tax gap is decomposed into three main components: nonfiling, underreporting, and underpayment (Internal Revenue Service, 2016). Our setting focuses on the underpayment margin. The municipal tax collection rate measures how much of the tax amount already assessed by the government is actually collected within the fiscal year. Thus, our estimates capture the fiscal capacity required to collect known tax liabilities, not the capacity to detect unreported tax bases or correct understated liabilities. This distinction is important for interpreting the results. The decline in collection rates after municipal mergers should not be interpreted as evidence that mergers increased tax evasion, nonfiling, or underreporting. Instead, the results indicate that mergers weakened municipalities' ability to collect assessed taxes on time. In other words, our analysis identifies a disruption in the enforcement and collection margin of fiscal capacity, rather than in the detection or assessment margin.

Selection Problems.— A final concern is the endogenous selection of municipalities into mergers. Municipal mergers were not randomly assigned, and municipalities that chose to merge may have differed from those that did not. Our event-study design absorbs time-invariant differences across municipalities, but it does not fully eliminate the possibility that treated and untreated municipalities would have followed different pre-existing trends in the outcomes of interest. This concern is relevant

in our setting because mergers were often motivated by the policy objective of maintaining sufficient population and administrative scale under demographic pressure. Appendix Figure A.8 shows that the population in merging municipalities was declining before the merger and continued to decline afterward.¹³ If this demographic trend directly shaped tax collection outcomes, it could complicate the interpretation of our estimates. Several pieces of evidence mitigate this concern. First, although merging municipalities exhibit a distinct population trend, Figure 3 shows no systematic change in assessed tax liabilities around the merger, suggesting that the measured tax base did not change discontinuously during the merger period. Second, Appendix Figure A.9 shows no distinct increase in gross migration in municipalities neighboring merged municipalities during the main merger period, suggesting that mergers did not generate large inflows or outflows that would mechanically alter the composition of taxpayers. Third, we re-estimate the main specifications using matched never-treated municipalities and matched hypothetical mergers constructed from adjacent never-treated municipalities. In both exercises, the timing and direction of the estimates remain similar to the baseline results. Finally, the main event-study patterns do not resemble a smooth continuation of pre-existing demographic change: tax collection rates decline sharply beginning in event time -1 , tax administrative costs fall only after formal consolidation, and cost-effectiveness rises after the merger. These outcome-specific timing patterns are difficult to explain solely by differential population trends. Therefore, while we cannot completely rule out selection into municipal mergers, the sharp timing of the estimates, the absence of corresponding changes in assessed taxes and migration, and the robustness of the results in more comparable matched samples suggest that the estimated effects capture meaningful consequences of merger-induced organizational change.

8 Conclusion

This paper examines how administrative consolidation affects the performance and cost of fiscal capacity. Using Japan's Great Heisei Municipal Mergers, we study whether consolidating local governments strengthens tax administration, reduces its resource cost, or creates a trade-off between collection performance and administrative efficiency. To examine this, we construct a municipality-level panel, aggregate pre-merger municipalities to their future post-merger boundaries, and estimate

¹³In this figure, we normalize the event study using event time -1 as the omitted reference period and focus on population levels from the merger period onward. This specification is intended to describe the evolution of population around mergers, rather than to estimate the baseline treatment effects relative to event time -2 .

event-study difference-in-differences models that exploit variation in the timing of municipal mergers.

The results show that municipal mergers changed the operation of local tax administration along two distinct margins. First, mergers did not systematically affect assessed tax liabilities, suggesting that the tax base, tax policy, and assessment capacity were not the primary margins affected by consolidation. Instead, mergers reduced tax collection rates, beginning in the transition period before the legal merger took effect. Second, municipal mergers substantially reduced the resource cost of tax administration. Unlike the decline in collection rates, the reduction in tax administrative costs appeared only after formal consolidation and became larger over time. This timing and composition of cost reductions are consistent with economies of scale in tax administration: merged municipalities were able to eliminate duplicated staffing, offices, procedures, and administrative inputs after their tax operations were formally combined.

These findings have implications for the study of state capacity and local government consolidation. Fiscal capacity is often understood as the ability of governments to raise revenue, but the results in this paper show that this capacity has both a performance margin and a cost margin. In particular, administrative consolidation can improve the efficiency of the state, but it can also disturb the organizational foundations on which state capacity rests. Therefore, evaluating such reforms requires looking not only at whether governments collect more or less revenue, or whether they spend more or less on administration, but at how consolidation changes the relationship between administrative inputs and fiscal performance.

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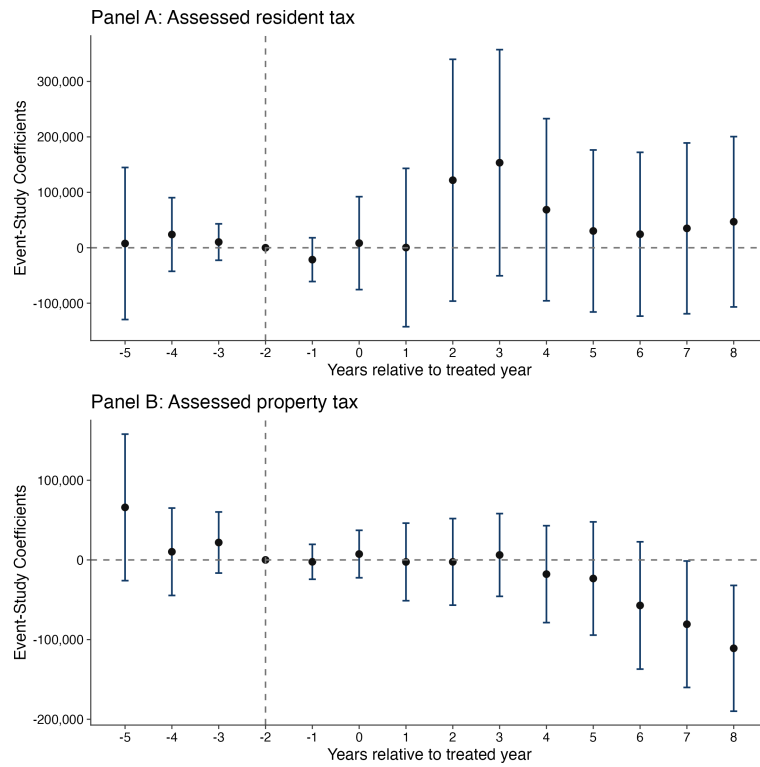
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A Online Appendix

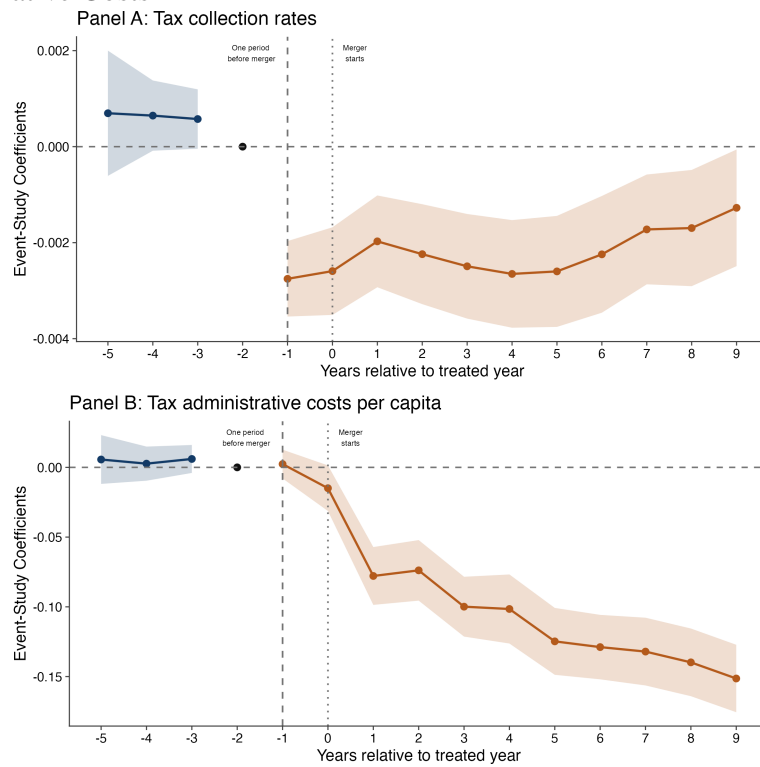
A.1 Figures and Tables

Figure A.1: Event-Study Estimates: Effects of Municipal Mergers on Assessed Tax Amounts by Tax Item



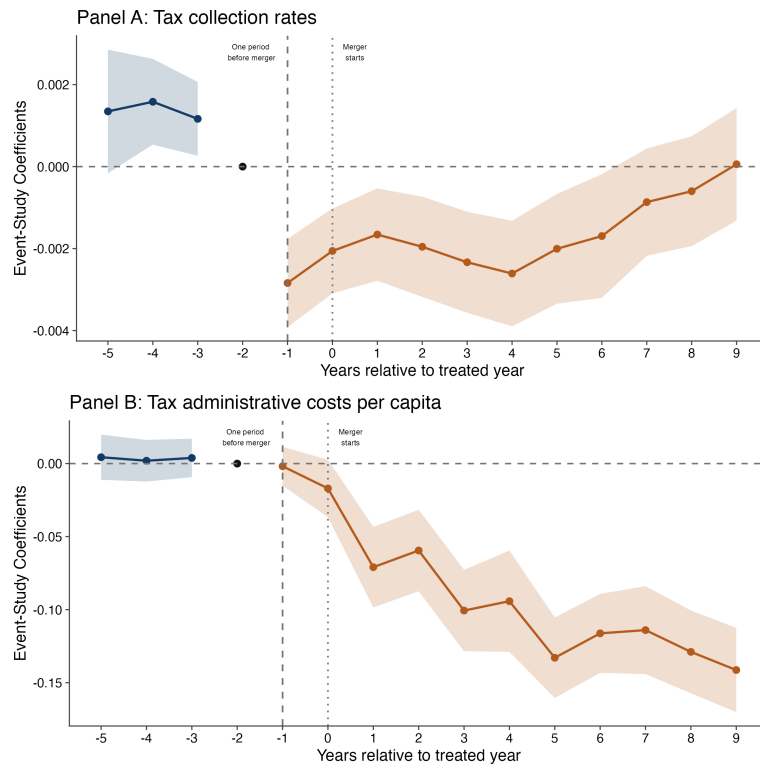
Note: This figure reports event-study estimates of the effects of municipal mergers on assessed tax amounts. Panel A reports estimates for assessed tax amounts on municipal resident tax, and Panel B reports estimates for assessed tax amounts on property tax. Event time -2 is the omitted reference period. Dots represent point estimates, and bars show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure A.2: Event-Study Estimates with Covariates: Effects of Municipal Mergers on Tax Collection Rates and Administrative Costs



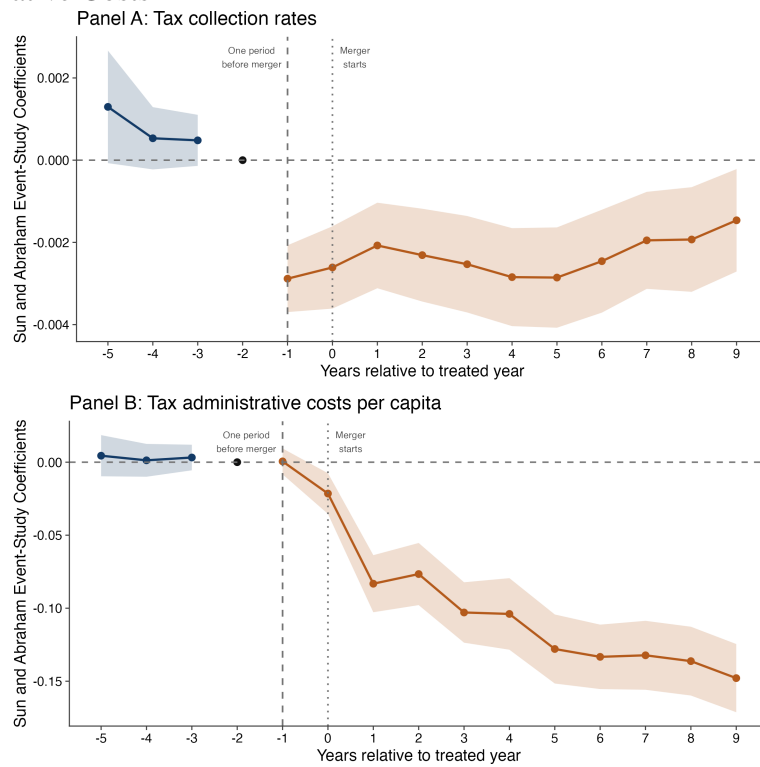
Note: This figure reports event-study estimates of the effects of municipal mergers on tax collection rates and tax administrative costs with time-varying covariates. Panel A reports estimates for tax collection rates, and Panel B reports estimates for tax administrative costs per capita. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure A.3: Event-Study Estimates Using Municipalities that Merged in 2005: Effects of Municipal Mergers on Tax Collection Rates and Administrative Costs



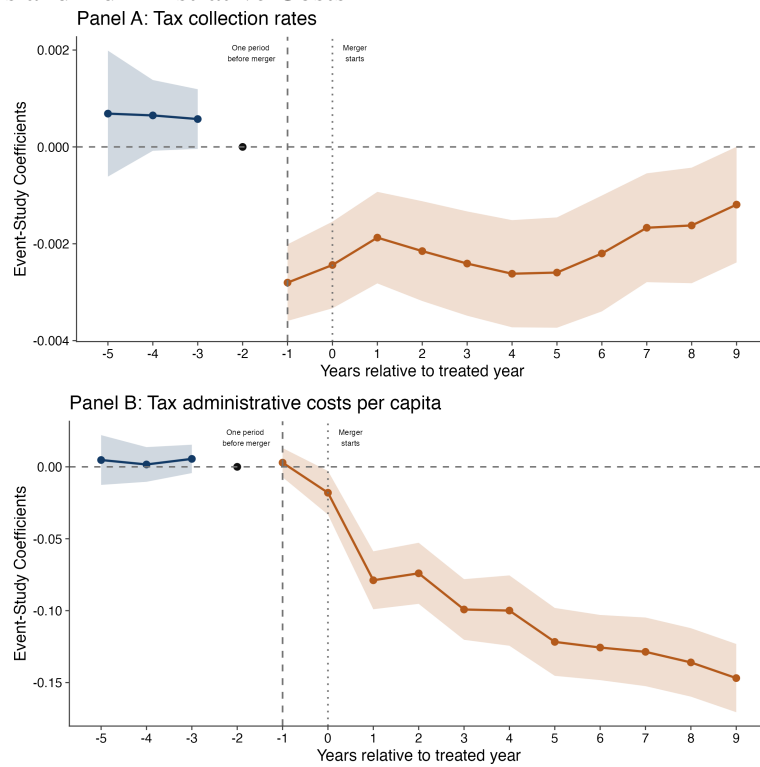
Note: This figure reports event-study estimates of the effects of municipal mergers on tax collection rates and tax administrative costs using municipalities that merged in 2005 as the treatment group. Panel A reports estimates for tax collection rates, and Panel B reports estimates for tax administrative costs per capita. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure A.4: Sun and Abraham (2021) Estimator: Effects of Municipal Mergers on Tax Collection Rates and Administrative Costs



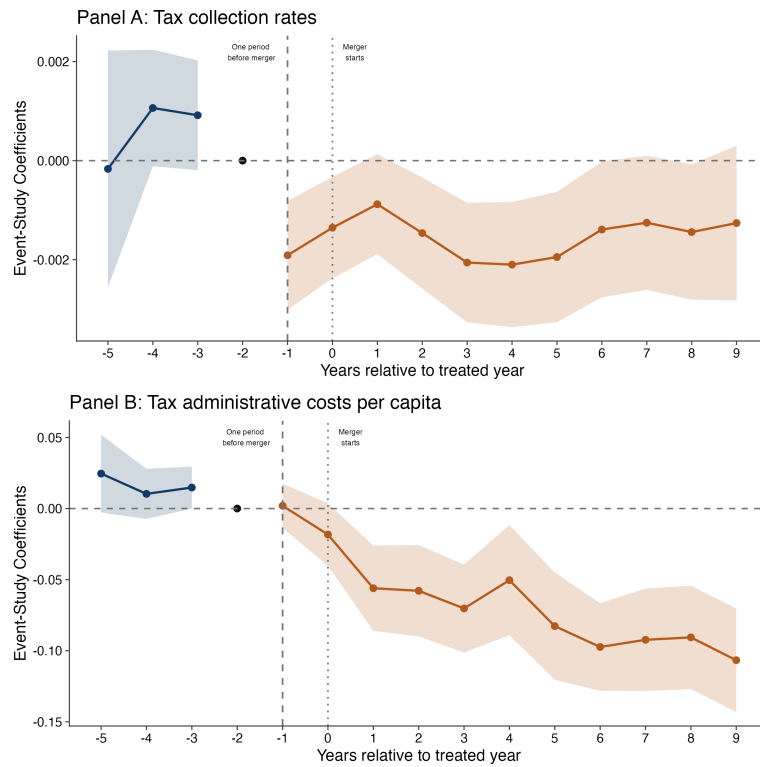
Note: This figure reports event-study estimates of the effects of municipal mergers on tax collection rates and tax administrative costs using the Sun and Abraham, 2021 interaction-weighted estimator. Panel A reports estimates for tax collection rates, and Panel B reports estimates for tax administrative costs per capita. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure A.5: Event-Study Estimates Using Matched Municipalities: Effects of Municipal Mergers on Tax Collection Rates and Administrative Costs



Note: This figure reports event-study estimates of the effects of municipal mergers on tax collection rates and tax administrative costs. The control group is restricted to municipalities matched on pre-merger covariates measured in 2000. Panel A reports estimates for tax collection rates, and Panel B reports estimates for tax administrative costs per capita. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure A.6: Event-Study Estimates Using Matched Pairs of Adjacent Municipalities: Effects of Municipal Mergers on Tax Collection Rates and Administrative Costs



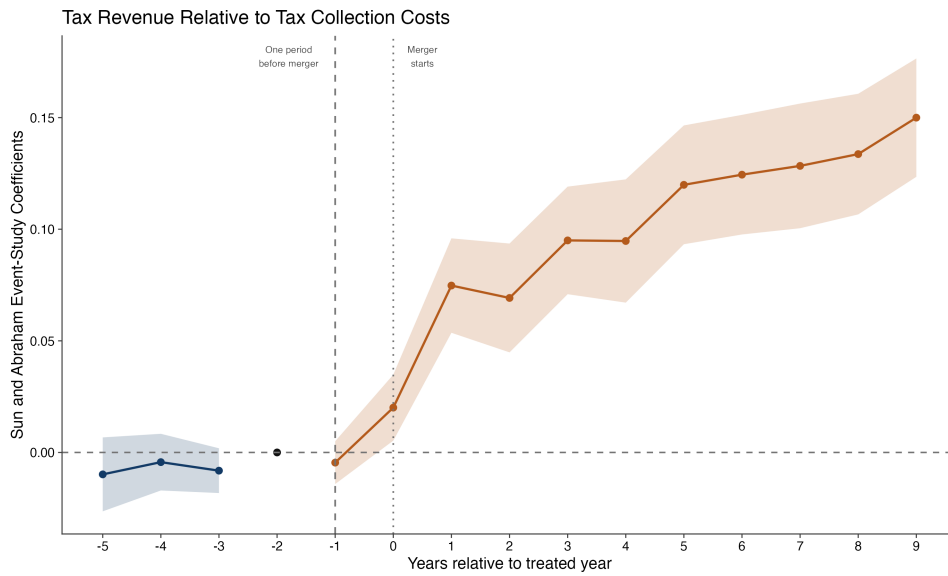
Note: This figure reports event-study estimates of the effects of municipal mergers on tax collection rates and tax administrative costs. The estimation sample is restricted to matched pairs of adjacent municipalities, where treated pairs consist of two adjacent municipalities involved in mergers and control pairs consist of all possible adjacent never-treated municipality pairs, matched using covariates measured in 2000. Panel A reports estimates for tax collection rates, and Panel B reports estimates for tax administrative costs per capita. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1 , when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0 , when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Table A.1: HonestDiD sensitivity for tax outcomes

Outcome	Window	Estimate	CI at $\bar{M} = 0$	CI at $\bar{M} = 0.25$	CI at $\bar{M} = 0.5$	CI at $\bar{M} = 0.75$	CI at $\bar{M} = 1$
Tax collection rates	-1-2	-0.00228	[-0.00309, -0.00148]	[-0.00340, -0.00117]	[-0.00393, -0.000637]	[-0.00453, -0.0000248]	[-0.00516, 0.000604]
Tax collection rates	3-5	-0.00247	[-0.00353, -0.00140]	[-0.00450, -0.000407]	[-0.00595, 0.00107]	[-0.00747, 0.00261]	[-0.00906, 0.00417]
Tax collection rates	6-9	-0.00159	[-0.00271, -0.000476]	[-0.00440, 0.00141]	[-0.00682, 0.00385]	[-0.00931, 0.00636]	[-0.0116, 0.00887]
Tax administrative costs	-1-2	-0.0426	[-0.0563, -0.0291]	[-0.0589, -0.0246]	[-0.0645, -0.0176]	[-0.0721, -0.00997]	[-0.0802, -0.00155]
Tax administrative costs	3-5	-0.108	[-0.128, -0.0874]	[-0.137, -0.0753]	[-0.155, -0.0572]	[-0.175, -0.0373]	[-0.195, -0.0170]
Tax administrative costs	6-9	-0.137	[-0.159, -0.115]	[-0.177, -0.0938]	[-0.208, -0.0623]	[-0.225, -0.0304]	[-0.225, 0.00202]

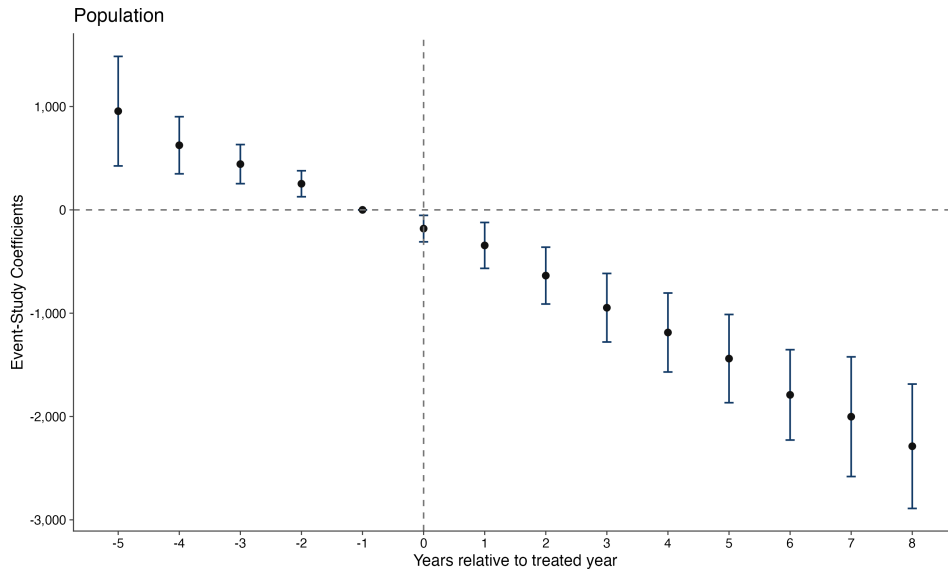
Notes: This table reports HonestDiD sensitivity intervals for the average event-study effects on tax collection rates and tax administrative costs per capita. Estimates are averaged over event-time windows -1 to 2, 3 to 5, and 6 to 9. The omitted reference period is event time -2, and the pre-treatment coefficients used to discipline possible violations of parallel trends are event times -5 to -3. Sensitivity intervals are based on the relative-magnitude restriction of [Rambachan and Roth \(2023\)](#). The parameter \bar{M} allows post-treatment violations of parallel trends to be up to \bar{M} times the largest pre-treatment violation.

Figure A.7: [Sun and Abraham \(2021\)](#) Estimator: Cost-effectiveness



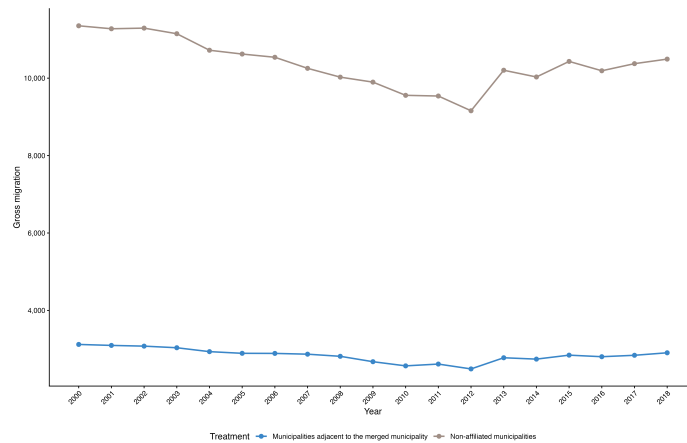
Note: This figure reports event-study estimates of the effects of municipal mergers on tax revenue relative to tax administrative costs using the [Sun and Abraham, 2021](#) interaction-weighted estimator. Event time -2 is the omitted reference period. The vertical dashed line indicates event time -1, when merger-related organizational restructuring begins, and the vertical solid line indicates event time 0, when the legal merger takes effect. Dots represent point estimates, and shaded areas show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure A.8: Event-Study Estimates: Effects of Municipal Mergers on Population



Note: This figure reports event-study estimates of the effects of municipal mergers on population. Event time -1 is the omitted reference period, so event time 0 and later periods are interpreted as post-treatment periods. The vertical dotted line indicates event time 0, when the legal merger takes effect. Dots represent point estimates, and bars show 95 percent confidence intervals. Standard errors are clustered at the municipality level.

Figure A.9: Trends in Gross Migration in Municipalities Adjacent to the Merged municipality



Note: This figure plots trends in gross migration for municipalities adjacent to merged municipalities. Gross migration is defined as the sum of in-migrants and out-migrants. Municipalities that are adjacent to merged municipalities but also experienced a merger themselves are excluded from the sample.