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The Impact of Compact City Policies on Land Prices: The Case of Toyama City

Hirotaka Fujioka　Tohru Naito

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Hirotaka Fujioka*
Doshisha University
Tohru Naito
Doshisha University†

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Abstract

This study examines the effects of compact city policies on land prices and how they contribute to its fiscal condition. Using Toyama City, Japan, as a case study, we apply a difference-in-differences approach to district-level panel data of official land prices from 2001 to 2025. The results reveal that residence-encouraged zones experienced significant land price appreciation after the implementation of compact city policies. Rising land prices expanded the property and city planning tax bases, contributing to the city's fiscal stabilization. The findings suggest that compact city policies can reorganize urban spatial structures as well as enhance fiscal sustainability—an outcome conceptualized as "urban management." This study provides new empirical evidence that compact city strategies in shrinking cities can generate both spatial and fiscal benefits, thereby offering practical implications for sustainable urban planning and local governance. However, there are some research limitations: the study does not consider the balance of expenditure and revenue, the time range of the policy, or the micro-level behavior of households or developers.

Key words: Compact city, Toyama City, Land price, Difference in differences, Urban management
JEL code: R14, R38, R51, C23, H71

1 Introduction

1.1 Background

The construction of sustainable cities has become a crucial global issue. Populations have been increasing in some regions, but decreasing in others. Low birth

*Corresponding author
Email: hfujioka@mail.doshisha.ac.jp
†Email: tnaito@mail.doshisha.ac.jp

rates and aging societies are especially urgent issues in East Asian countries. The United Nations Sustainable Development Goals highlight sustainable urban development, with Goal 11 aiming to make cities inclusive, safe, resilient, and sustainable. Compact cities are regarded as one model of sustainable cities, although the concept itself involves inherent dilemmas: the compact city concept inherently embodies tensions between economic growth objectives and social and environmental sustainability goals, as efforts to promote urban competitiveness and densification often conflict with equity, livability, and green-space preservation (Hofstad, 2012). Neuman (2005) argues that the notion of a compact city involves a paradox: functions and populations must be concentrated at higher densities for sustainability, yet dispersed at lower densities for livability. He argues that attention should shift from the urban form to the process of urbanization. Originating from Dantzig and Saaty's (1973) experimental city, the idea of a compact city has since evolved, and generally refers to moderately dense, mixed-use development around a city center. Dieleman et al. (2004) point out that the compact city concept is closely related to the notion of multifunctional land use and has the potential to curb urban sprawl and further growth of car use, although this would be difficult to implement. As Kaido (2001, 2007) notes, discussions about compact cities have also emerged in Japan. Hattori et al. (2017) point out that in regional cities, compact planning has been promoted since the early 2000s as a response to urban shrinkage. Kim (2019) focuses not on shrinking-city policy but on shrinking-city design, arguing that a single strategy cannot remedy urban shrinkage and that a set of context-specific strategies is needed to cope with its multiple issues. This perspective can be applied not only to urban design but also to urban planning.

The OECD (2012) identifies Portland, Paris, Vancouver, Melbourne, and Toyama as notable compact cities. Unlike the other four cities, Toyama faces population decline and a small urban scale. While the others can be regarded as "expanding compact cities," Toyama represents a rare case of a "shrinking compact city." However, few studies have explored the implementation of policies to effectively shrink compact cities. In this study, we focus on the case of Toyama City and aim to fill the research gap between expanding and shrinking compact cities.

1.2 Issues and Hypothesis

Building on the case of Toyama City, Fujioka and Sakakibara (2020) first clarify the distinctive context of a shrinking, compact city by documenting district-level population dynamics within residence-promotion districts, showing that the visible effects of the policy emerged only gradually. Fujioka (2023) then advances from description to causal inference by applying a difference-in-differences (DID) design informed by push–pull theory to identify a 12–16% population increase in targeted districts of Toyama after 2005, while also highlighting family-formation events as plausible drivers. Regarding the relationship between compact cities and residential location choice, Fujioka (2024) develops a simulation model for the residential location choices of working women in Toyama, considering com-

pact city planning. The results suggest that reducing land costs and providing incentives are essential for promoting compact and sustainable urban development. Most recently, Fujioka and Sakakibara (2024) broaden the perspective to the long-run urban form of Toyama, tracing how land readjustment shifted from outward expansion to station- and center-oriented redevelopment under the compact city policy. Collectively, these studies identify what has changed (population concentration and development geography), demonstrate the causal role of policy interventions, and show how Toyama's urban structure has been redirected inward.

Regarding the existing research on Toyama City's compact city policy, Iwata et al. (2021) explore the effect of the compact city policy on incumbent retail productivity and show spillover effects in the long term but not the short term. However, several challenges remain: early analyses lacked sufficiently long pre-policy panels; the mechanisms and distributional consequences of relocation (e.g., spillovers, accessibility, and housing costs) remain underexplored; and land readjustment captures only part of the development dynamics, necessitating integration with other data, such as permits, vacancy, and redevelopment records. Thus, the next research step is a unified micro-to-macro evaluation connecting household mobility, service networks, and long-term sustainability outcomes. Existing research, such as Jung et al. (2026), has discussed the relationship between compact cities and amenities. They demonstrate that, in shrinking Korean cities, higher amenity compactness and diversity enhance the survival of local services, suggesting that compactness should be viewed through the lens of functional networks rather than population density alone. Relatedly, Sakamoto et al. (2018) show for Utsunomiya that actual residential turnover is driven by rail accessibility and inheritance rather than a bus-oriented policy, highlighting the gap between compact city ideals and residents' behavior. By considering the remaining problems, this study focuses on the perspective of housing costs, which can be reflected in land prices. Regarding existing research on the relationship between the compactness of a city and housing or land use, Posda (2018) develops a monocentric model with both a formal and an informal sector in the housing industry. In this model, a lower level of public infrastructure in the city results in a higher level of informal housing and fewer buildings in the formal sector. In such a situation, cities become less compact. Therefore, to create a compact city, controlling the housing sector is important, and it must reflect in changing land prices.

We hypothesize that compact city policy can raise land prices and improve the fiscal condition in Toyama City, known as "urban management." Specifically, compact city policies are expected to enhance accessibility and agglomeration economies in central areas. Consequently, they are likely to raise land prices in the targeted districts compared to those in peripheral or non-designated areas. Rising land prices, in turn, expand the property and city planning tax bases, thereby strengthening the fiscal foundation of local governments. This mechanism reflects the essence of "urban management" through which compact city policies can contribute to both spatial and fiscal sustainability, even in shrinking cities, such as Toyama.

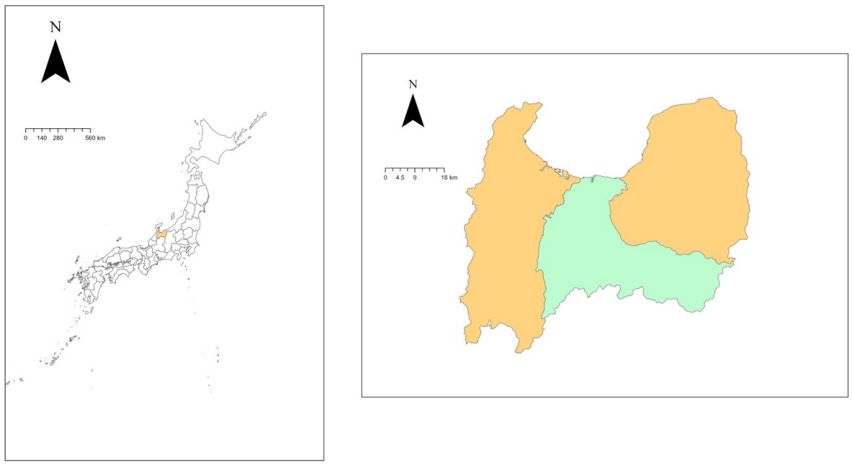

Figure 1: The location of Toyama City

1.3 Structure of the Paper

The remainder of this paper is organized as follows. In Section 2, we discuss the details of Toyama City's compact city policy including its history. In Section 3, we present the dataset and models to estimate the impact of the compact city policy on land prices. We estimate its impact and present the results in Section 4. Finally, Section 5 concludes the paper.

2 Policy and History

In this section, we review the policy and history of Toyama City and identify the key elements for creating a compact city. Toyama City is the capital of Toyama Prefecture and has 402,166 inhabitants as of August 2025.[1] It was also designed as a core city in Japan. Toyama City is located in the middle of Japan and is part of the Hokuriku area. [2]

2.1 The Concept of Toyama City's Compact City Policy

Toyama City has six potential problems: population decline and super-aging, urban sprawl, rising administrative costs, car dependency and declining public transport, an increasing proportion of people unable to freely use cars, and transitioning to a low-carbon society (rising CO_2 emissions) (Toyama City, 2024).

[1] Toyama City (n.d.). Population of Toyama City. Retrieved October 2, 2025. `https://www.city.toyama.toyama.jp/kikakukanribu/kikakuchoseika/tokei/jinkosetai/jinkosetai.html` (in Japanese).

[2] Normally, Hokuriku consists of Fukui, Ishikawa, and Toyama prefectures.

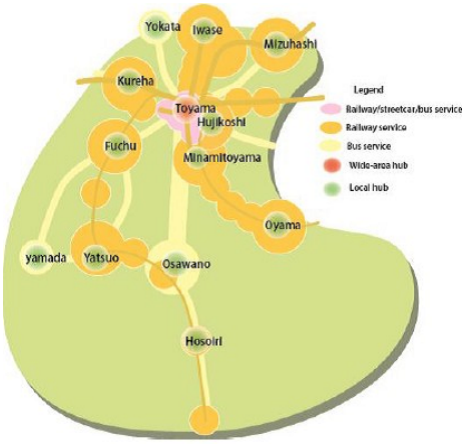

Figure 2: The structure of Toyama City ' s compact city policy.
Source: Toyama ' s Unique Compact City Management Strategy

By focusing on these problems, Masashi Mori became the mayor of Toyama City in 2002. He issued the first "Emergency Program to Avoid a Fiscal Crisis" and worked to improve Toyama City's fiscal situation, which would become the foundations for his unique compact city policy. He said as follows.

"Even if we cannot stop population decline, I believed there must be ways to mitigate it. That ' s when I realized that in Toyama City, all public transportation—the Toyama Chiho Railway, JR trains, city trams, and buses—centers around Toyama Station as a single hub. This means that by using public transport, you can reach anywhere in the region without a car. Consequently, in March 2003, I announced a vision for compact city development centered around public transport." [3]

Toyama City's structure can be illustrated as by the image of dumplings and skewers. Skewers represent public transport offering a higher level of service, and dumplings represent population centers connected by the skewers, allowing pedestrian access to various city amenities. Through this structure, Toyama City tries to revitalize public transport, including railway track lines, and to concentrate on various city functions, such as residential, commercial, business, and cultural buildings along public transportation lines. Reflecting this structure, the compact city policy in Toyama City has three pillars: the revitalization of public transportation, encouraging residents to relocate to zones along public transportation lines, and revitalization of the city center. [4]

[3]These comments are based on an interview with Mori on February 8, 2023.

[4]Toyama City (n.d.) Toyama's Unique Compact City Management Strategy. Retrieved October 3, 2025, `https://uncrd.un.org/sites/uncrd.un.org/files/7th-est_keynote2.pdf`.

2.2 The Residence Promotion Schemes in Toyama City

There are two residence promotion schemes in Toyama City: The City Center Dwelling Promotion Scheme and a scheme to promote dwelling along the public transportation axes. Toyama City has established two residence-encouraged zones for these schemes (city center area and residential promotion zones along the public transportation line), and citizens who live in or move to these zones receive subsidies. The city center comprises 436 ha, and the residential promotion zones along the public transportation line are those located within 500 m of train stations and 300 m of bus stops. All schemes are not only for citizens but also for construction companies. The City Center Dwelling Promotion Scheme began in July 2005, and a scheme to promote dwelling along the public transportation axes began in October 2007. Further details on each residence promotion scheme are presented in Table 1.

Table 1: Details of Residence Promotion Scheme

Target areas	**For whom**	**Types of schemes**
City centers	Citizens	City center housing acquisition support scheme City center renovation assistance scheme City center housing rental subsidy scheme Multi-habitation promotion scheme
	Construction companies	Scheme to promote the construction of apartment blocks in the city center Local excellent rental housing maintenance cost subsidy scheme Scheme to support city center housing conversion Scheme to support stores annexed to housing in the city center City center residential land maintenance promotion scheme Scheme to support and maintain disposal and wastewater treatment system in the city center
Public transportation axes	Citizens	Scheme to support public transportation axes housing acquisition Rent subsidy scheme for single-parent families Public transportation axes renovation assistance scheme
	Construction companies	Scheme to promote the construction of apartment blocks in the public transportation axes Local excellent rental housing maintenance cost subsidy scheme Public transportation axes residential land maintenance promotion scheme

2.3 Toyama City's "Urban Management"

The above promotion schemes were not implemented in isolation, but were part of Toyama City's broader "urban management" strategy. This strategy integrates land-use planning, public transportation revitalization, and fiscal policy into a unified framework aimed at creating a sustainable urban structure. In other words, Toyama's compact city policy is not only about concentrating the population and functions but also about rebuilding the city's financial foundation through land value stabilization and reinvestment in core areas.

Why is it necessary to shed light on the terms of land prices? As discussed in Section 2.1, Toyama's unique compact city policy consists of three pillars. Mori, the former mayor of Toyama City, stated as follows:

"The third pillar of the policy was concentrated investment in the city center, including the main shopping district. Since the collapse of the economic bubble, land values in regional cities have steadily declined, undermining the property and city planning tax base, which accounts for nearly half of municipal revenues. Declining land values in core areas tend to drag down the entire urban market, whereas targeted investment in these areas can stabilize or even raise values, ultimately generating higher tax revenues. In fact, property- and planning-related tax revenues increased by 13% over the past decade, although the effect took more than 15 years to materialize. This approach reflects the logic of 'urban management,' a concept seldom used at the time but identified as one of the three pillars of the policy announced in November 2001." [5]

In a society with a low birthrate and aging, the total municipal tax decreases, and it is not a good decision to rely on fiscal earnings from this source. Instead, earning income from property and city planning taxes is the key to compact city planning.

What is the current situation regarding property and city-planning taxes? Figures 3 and 4 show the trends from 2000 to 2020, respectively. Regarding property taxes, the trend of total revenue increased slightly, especially from 2015 to 2020. However, its percentage against the municipal tax fluctuates significantly; since 2015, it has generally shown an upward trend. Regarding the city planning tax, the trend in total revenue can be grouped from 2000 to 2005, 2006 to 2015, and 2016 to 2020. It rises, falls, and then rises again. The percentage trend is similar, and the five-year trend has been quite steady.

Considering the recent changes in property and city planning taxes, their standards remain quite high. However, we cannot determine the reason for this increase. Normally, land prices are very important for earnings from taxes. Next, then, we turn to estimating the impact of land prices on Toyama City's compact city policy.

[5] The quotation is from an interview with Mori, held on February 8, 2023.

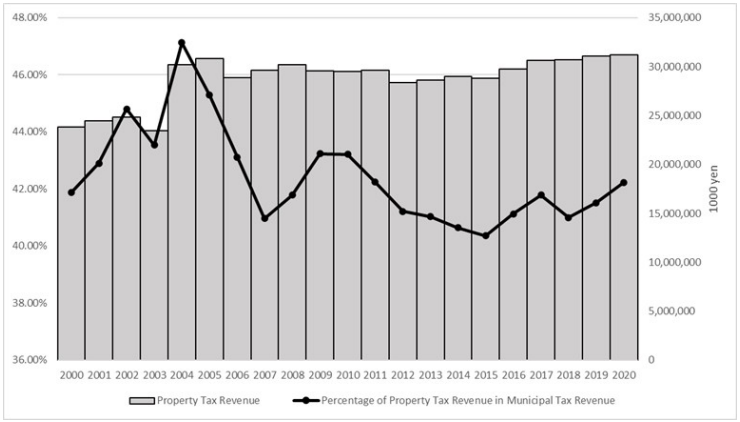

Figure 3: Trends in Toyama City's property tax from 2000 to 2020
Source: Toyama City (each year)

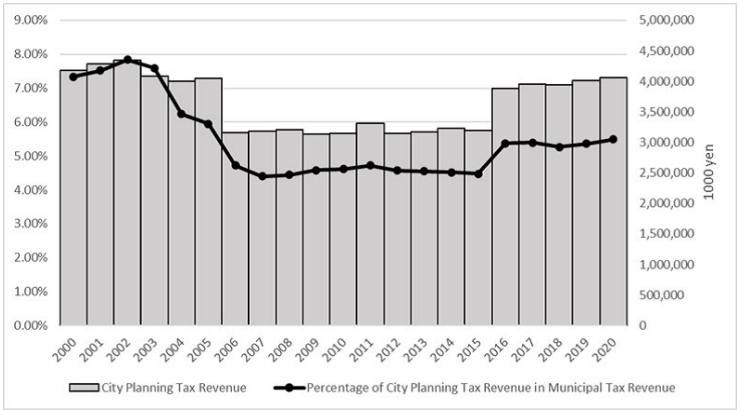

Figure 4: Trends in Toyama City's city planning tax from 2000 to 2020
Source: Toyama City (each year)

3 Data and model

3.1 Data

In this study, we construct a panel dataset of official land prices in Toyama City from 2001 to 2025 to quantitatively estimate the effects of the compact city policies implemented. Data on official land prices were obtained from the "Digital National Land Information" portal of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japan. We use official land prices to estimate benefits. The MLIT of Japan publishes official land prices for standard sites nationwide as of January 1 each year, with results released every March. Because land price points are reviewed annually, data are not available for every year from 2001 to 2025. Thus, the panel data are unbalanced. The sample size of the panel data is 2164. The official land price data include data on the year, land area, shape, road widening in front of the site, land use, nearest train station, distance to the station from the site, orientation, and availability of gas and water services. In the estimations presented below, we use some information on these characteristics as control variables. [6]

We also processed the data using ArcGIS Pro (ver. 3.5) to supplement the dataset on land price characteristics provided by National Land Numerical Information. For example, although the National Land Numerical Information contains data on the distance to the nearest station, it does not provide information on the distance to JR Toyama Station, which is the principal transportation hub in Toyama City. To address this, we obtained railway and station data for lines operating within Toyama City from the National Land Numerical Information database and conducted spatial mapping. We then refine the dataset by calculating the straight-line distance from each land price point to Toyama Station.

Toyama City has implemented two compact city policies. The first is the "*City Center Dwelling Promotion Scheme*," targeting Toyama Station and the city center. The second is a "*scheme to promote dwelling along the public transportation axes,"* designed to encourage residential settlement along the railway network extending from Toyama Station. Figures 5 and 6 present the areas designated as targets for each of these projects, respectively.

Although we describe this in detail later, it is necessary to distinguish between the areas targeted by the compact city policies implemented in Toyama Prefecture and other areas. Toyama City designated two target areas for its policies to create a compact city. One is a policy called the City Center Dwelling Promotion Scheme. The area designated as the city center dwelling promotion scheme includes Toyama Station, which serves as the hub of Toyama City's transportation network, and Toyama City Hall, the administrative center of the city. The other policy targets areas along railway lines, designed to encourage residential settlement along public transportation routes. We obtained data on these two areas from Toyama City Hall. Figure 5 illustrates the area of the city center dwelling promotion scheme. As Figure 5 shows, this area locates

[6] See National Land Information Homepage, https://nlftp.mlit.go.jp/ksj/

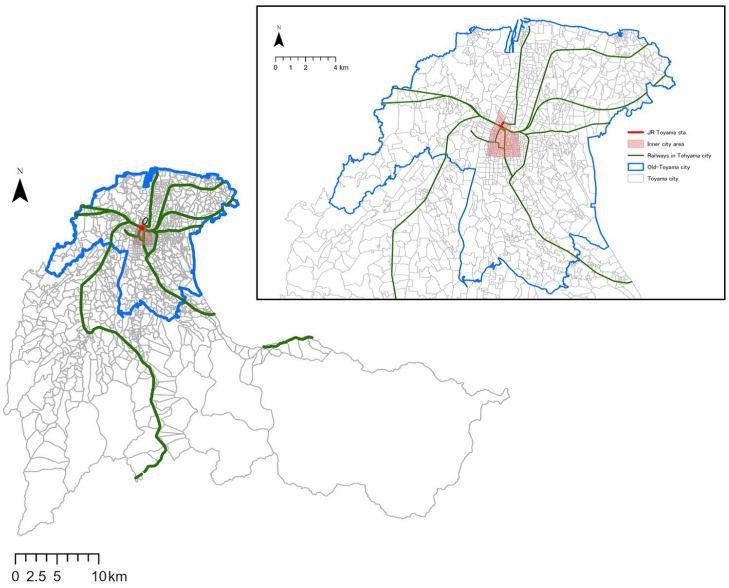

Figure 5: The city center dwelling promotion scheme area in Toyama City

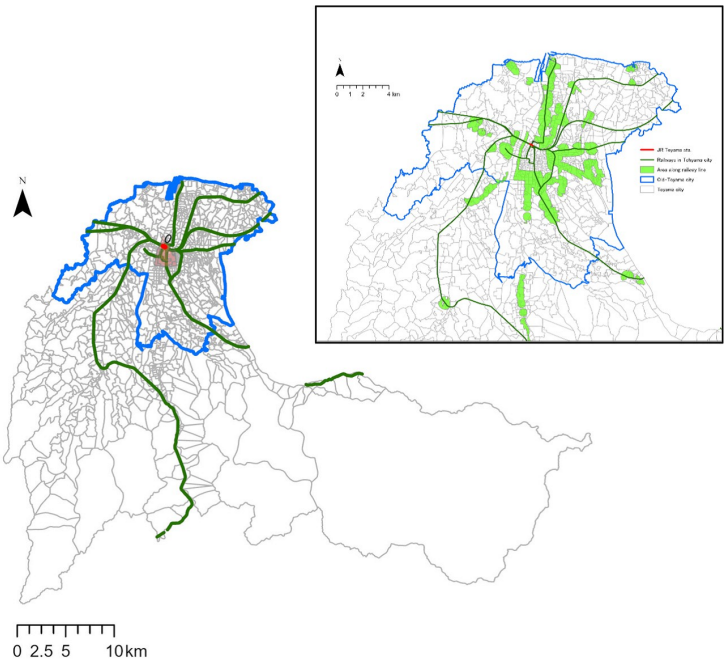

Figure 6: A scheme to promote dwelling along the public transportation axes in Toyama City

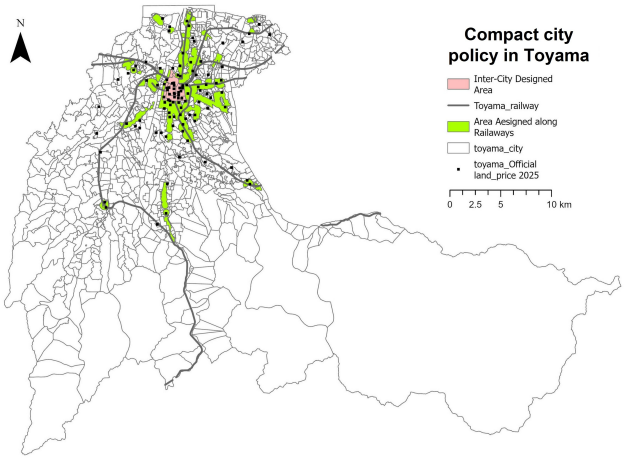

Figure 7: Toyama City Compact city areas and official land price in 2025

around JR Toyama station, which is the hub of public transportation in Toyama City. Figure 6 illustrates areas of a scheme to promote dwelling along the public transportation axes. These are designed areas that are accessible within walking distance of stations located along the public transportation lines that radiate from JR Toyama Station, which serves as a hub.

We adopt a hedonic approach based on official land prices (*Koji-chika*), relying on the capitalization hypothesis to estimate the impact of each compact city policy in Toyama City. Moreover, we employ the DID approach. Land price points located within each compact city policy area we were considered the treatment group, whereas those located outside these areas we were treated as the control group. Figure 7 illustrates the areas designated as a compact city in Toyama City and the official land prices in 2025. The orange-shaded areas around Toyama Station were determined using the City Center Dwelling Promotion Scheme. Therefore, The green-shaded areas represent areas determined by a scheme to promote dwelling along the public transportation axes. Similar to the case of the city center dwelling promotion scheme, We deal with points included in the green-shaded areas as the treatment group and do not include them when estimating the benefits of this compact city policy.

The points in Figure 7 represent the official land prices in Toyama City in 2025. On the map, some points fall within the areas designated under Toyama ' s compact city policies, whereas others do not. We adopted a DID approach to quantitatively estimate the effectiveness of compact city policies using official land prices in a hedonic framework. Accordingly, land price points located within these areas were treated as the treatment group, whereas those outside these areas served as the control group.

Considering that the City Center Dwelling Promotion Scheme was implemented in 2005, and a scheme to promote dwelling along the public transporta-

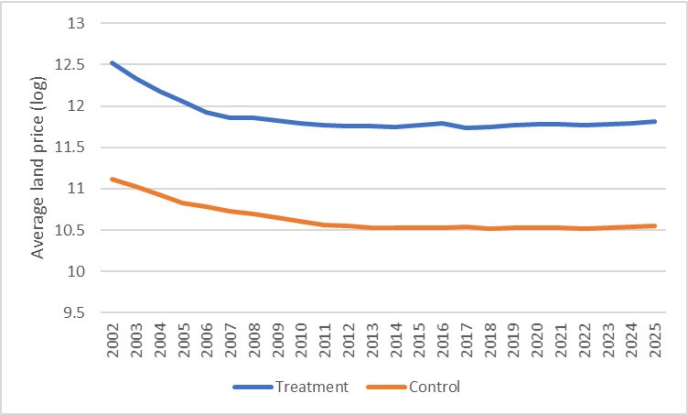

Figure 8: Parallel trends of treatment group and control group (1)

tion axes in 2007, we treated these as events and evaluated the official land prices (precisely, the changes in official land prices) before and after each event. When employing the DID approach, the so-called parallel trend assumption must hold, meaning that the trends in the treatment and control groups are similar prior to the occurrence of the event. To verify this assumption, we examined the trends in the average land price points for the treatment and control groups in each compact city scheme.

Figure 8 presents the time series of the average official land price points in the City Center Dwelling Promotion Scheme, comparing those within the target area (treatment group) with those outside the target area (control group). Considering that the City Center Dwelling Promotion Scheme was implemented in July 2005, it is sufficient to verify whether the parallel trend assumption holds for the period up to 2005. As shown in Figure 8, the average of the treatment and control groups exhibited roughly parallel trends from 2001 to 2005, whereas the treatment group's average slightly after 2006.

Figure 9 presents the time series of the average official land price points for a scheme to promote dwelling along the public transportation axes, with points within the target area as the treatment group and those outside as the control group, covering the period from 2001 to 2025. Considering that a scheme to promote dwelling along the public transportation axes was implemented in 2007, the averages of the treatment and control groups can be regarded as following similar trends until 2007. Therefore, the parallel trend assumption prior to the event is considered to hold for both compact city policies, and the subsequent analysis proceeds accordingly.

Another important point is that the panel data on official land prices used in this analysis constitute an unbalanced panel. Official land price points are re-evaluated every few years, and the set of points under assessment is periodically updated; therefore, the observation periods for each point are not necessarily the same. Therefore, the observation periods in this study were uneven, resulting in

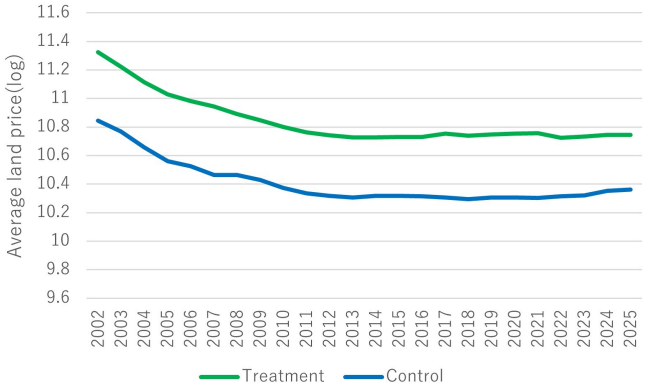

Figure 9: Parallel trends of treatment group and control group (2)

an unbalanced panel, which requires caution when applying the DID approach. However, the main causes of missing data are points newly adopted as official land price points, or points for which surveys were discontinued. As these do not directly affect the assignment of the treatment and control groups, the DID estimators are considered identifiable without bias.

3.2 The model

We estimated the impact of Toyama's compact city planning on incumbent retailers located in "the City Center Dwelling Promotion Scheme" and "a scheme to promote dwelling along the public transportation axes" using the DID approach. The estimation model is

$$\Delta \ln y_{it} = \beta_0 + \beta_1 Area_i \times Year_t + \beta_2 Year_t + \gamma \mathbf{X}_{it} + \sigma_i + \delta_t + \varepsilon_{it} \qquad (1)$$

where y_{it} is the official land price at point i in year t; We use the first difference in the logarithm of y_{it}, that is, $\Delta \ln y_{it}$, as the dependent variable. As the log difference approximates the growth rate, the estimated coefficients can be interpreted as semi-elasticities. $Area_i$ is a dummy variable representing the treatment group. We designated the official land price points included in each compact city policy area as the treatment group and the other points as the control group. $Area_i$ takes a value of 1 for points designated as the treatment group and 0 otherwise. $Year_t$ is a dummy variable indicating whether the compact city policy was implemented in year t. It takes the value of 1 in years after the implementation of the compact city policy and 0 in other years. Each compact city policy was implemented in March of the same year. Because official land prices are assessed every January, land prices in the year of policy implementation do not reflect the effects of the compact city policies. As discussed in Subsection 3.1, the identification strategy relies on the parallel trends assumption, which states that, in the absence of compact city policies, the outcome

variable would have followed parallel trends between the treatment and control groups.

For the control variables, we included a set of variables to account for potential confounding factors. Specifically, we control for economic and geographic indicators that may have influenced the dependent variable. Including these controls helps isolate the treatment effect and ensures that the estimated coefficient on the interaction term accurately captures the causal impact of the policy. The control variables include the distance from each point to JR Toyama Station, the distance from each point to the nearest railway or light rail station, land parcel size (in square meters), building coverage ratio (BCR), floor area ratio (FAR), and an urbanization-controlled area dummy. Moreover, σ_i represents the point fixed effects capturing the time-invariant unobserved characteristics of each official land price point, and δ_t denotes the year fixed effects that control for time-specific shocks that are common to all points. The panel is unbalanced because some observation points have been re-evaluated or replaced over time. Following Bertrand et al. (2004), we clustered standard errors at the official land price point level to address the potential serial correlation in the error term.

4 Results

We estimate the fixed-effects model (1) using the dataset described above. To facilitate the comparison, we also present the results obtained from the pooled model. Table 2 reports the estimated coefficients along with the corresponding standard errors clustered at the official land price point level. The variables absorbed by the fixed effects in the fixed-effects specification are left blank. Significance levels are indicated by asterisks: * $t < 0.1$, ** $t < 0.05$, and *** $t < 0.01$.[7]

Table 2 reports the estimation results obtained from the pooled OLS and two-way fixed-effects (FE) models. Columns 1 and 2 present the results of the pooled model, and Columns 3 and 4 present the results of the FE specification. Columns 1 and 3 correspond to the City Center Dwelling Promotion Scheme and Columns 2 and 4 correspond to a scheme to promote dwelling along the public transportation axes.

Across all specifications, the estimated coefficients on the treatment variables are positive and statistically significant at the 1% level, implying that both compact city policies have contributed to an increase in official land prices within the designated areas. The magnitudes of the estimated effects are larger under the FE specification (Columns 3 and 4), suggesting that controlling for the unobserved time-invariant heterogeneity across land price points amplifies

[7] Area×Year, Year Dummy, Dist. To JR Toyama sta., Dist. to the nearest sta., parcel size, BCR, FAR, Urbanization area Dummy, and Const. in Table denote Area × Year interaction term, year dummies, distance to JR Toyama Station, distance to the nearest station, parcel size, building coverage ratio (BCR), floor area ratio (FAR), urbanization area dummy, and constant term, respectively.

Table 2: Estimation results

	(1)	(2)	(3)	(4)
Area×Year	0.013^{***}	0.006^{***}	0.022^{***}	0.023^{***}
	(0.002)	(0.001)	(0.007)	(0.006)
Year Dummy	0.062^{***}	0.073^{***}	0.058^{***}	0.065^{***}
	(0.001)	(0.002)	(0.002)	(0.006)
Dist. to JR Toyama sta.	-0.002^{*}	-0.005^{***}		
	(0.001)	(0.001)		
Dist. to the nearest sta.	-0.0001	0.002^{*}		
	(0.001)	(0.001)		
Parcel size	-0.002^{**}	0.001		
	(0.001)	(0.009)		
BCR	-0.041^{***}	-0.051^{***}		
	(0.008)	(0.008)		
FAR	0.002	-0.009^{***}		
	(0.003)	(0.003)		
Urbanization area Dummy	0.006^{**}	0.006^{***}		
	(0.002)	(0.003)		
Const.	0.098^{***}	0.085^{***}	-0.006^{***}	-0.081^{***}
	(0.027)	(0.003)	(0.028)	(0.003)
Area FE	no	no	yes	yes
Adj-R^2	0.53	0.52	0.53	0.52
F-value	292.6	278.2	363.8	207.2

the estimated policy impacts. Importantly, these results are robust, highly stable, and remain consistently positive and significant across different model specifications, policy types, and the inclusion of control variables. This stability reinforces confidence that the observed effects genuinely reflect the causal impact of the compact city policies, rather than model-specific artifacts.

Regarding the control variables, the results are largely consistent with expectations: land prices tend to decrease with increasing distance to JR Toyama Station, while higher BCRs are associated with lower price growth. Points located in urbanized areas tend to experience higher growth, reflecting the spatial concentration of land demand. These patterns confirm that the model appropriately accounts for geographic and structural factors, thus isolating the causal impact of the policies.

Importantly, the positive and statistically significant effect of compact city policies on land price growth is consistent with the observed increase in municipal property tax revenue in Toyama City following policy implementation. Because property taxes are levied based on land values, the estimated rise in land prices directly translates into a higher tax base, providing a tangible fiscal

impact in addition to the urban revitalization effect. This alignment between the empirical land price changes and tax revenue outcomes reinforces the validity of the estimated policy effects and highlights the broader economic significance of compact city initiatives.

Overall, these results provide robust evidence that compact city policies have effectively enhanced the urban land value in designated areas, which is consistent with both theoretical expectations and fiscal observations. The findings also suggest that the design and location of each policy are critical in determining its effectiveness and offer important implications for future urban planning initiatives.

The estimation results suggest that the implementation of compact city policies in Toyama City is consistent with the observed increase in property tax revenue. In particular, a policy framework that promotes the concentration of population and economic activities in the urban center likely enhances land-use efficiency and raised land values, thereby expanding the taxable property base and increasing local tax revenues. This finding implies that compact city policies function not only as urban planning measures for spatial reorganization, but also as economic policy instruments that contribute to the fiscal sustainability of local governments. Accordingly, the results provide empirical evidence supporting the existence of fiscal externalities arising from urban densification.

5 Concluding remarks

This study quantitatively evaluated the effectiveness of compact city policies in Toyama City, Japan. These policies are broadly classified into two types: the City Center Dwelling Promotion scheme, targeting the central business district, and a scheme to promote dwelling along the public transportation axes, promoting residential concentration along railway lines extending from the city center. We employed a panel dataset of official land prices from 2001 to 2025, using the first difference in land prices as the dependent variable and logarithmic transformation for non-dummy covariates. Both pooled OLS and FE models were estimated, and in all specifications, the coefficients on the interaction term (Area$\times$Year) were positive and statistically significant.

These results indicate that the compact city policies in Toyama City contributed to an increase in land prices within the designated areas. This result is consistent with the observed increase in property tax revenue following the introduction of these policies, as noted in the introduction. The concentration of population and economic activities in the city center, as well as residential promotion zones along the public transportation line, likely improved land-use efficiency and raised land values, thereby potentially expanding the local tax base. The findings suggest that compact city policies function not only as instruments for urban spatial reorganization, but also as mechanisms that can enhance the fiscal sustainability of local governments.

This study suggests that urban form management can function as a fiscal strategy—what Toyama's former mayor described as "urban management." As

described in Section 2, it is not desirable to rely on earnings from resident tax when the population is decreasing. Using the strategy of "urban management," cities can not only reorganize urban space but also improve their fiscal condition. Other shrinking cities can draw lessons from Toyama's experience: aligning land use, public transport, and fiscal policy could mitigate the negative effects of population decline.

However, this study has some limitations. First, we do not discuss the entire fiscal situation in Toyama City. As we described, citizens and companies can receive subsidies if they move to the residential promotion area. Subsidies are a form of expenditure while property and city planning taxes are a form of revenue. We did not consider which element was higher. If expenditure was higher than revenue, the effects of "urban management" could be limited. Second, we did not take into account how many years it would take for the policy to take effect . In this study, we hypothesized that the effects of the policy would appear soon. Third, this study employed official land price data and did not directly capture the micro-level behavior of households or developers. Future research should integrate individual-level mobility data, housing market transactions, and spatial network analysis to better understand the mechanisms underlying land value formation under compact city policies. These limitations should be addressed in future studies.

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