From Samurai to Skyscrapers: How Historical Lot Fragmentation Shapes Tokyo*

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Abstract: Can transaction costs in the urban land market generate lot size persistence and persistently hinder efficient land use? Using historical data in Tokyo, we study how initial lot fragmentation has affected urban development by exploiting the plausibly exogenous supply shock of large lots in 1868, the release of local lords' estates (*daimyo yashiki*) scattered throughout old Tokyo, now the central business district. We construct a 100 m*100 m-cell-level dataset spanning 150 years. Using ordinary least squares and a regression discontinuity design, we find that cells previously used as local lords' estates have larger lots today, implying that lot size persistence exists. We also find positive effects on land use and activities, that is, taller buildings, higher land prices, and higher firm productivity, implying lot size premia due to assembly frictions. We provide two pieces of evidence that these positive effects are explained by the growth of skyscrapers requiring large footprints. First, tall buildings explain the effect of local lords' estates on firm productivity today. Second, we find no positive impact on land prices before the skyscraper age. Instead, it was *negative*, suggesting that split frictions were dominant at that time and assembly frictions became more relevant with the emergence of skyscrapers.

Keywords: Transaction costs, Historical persistence, Skyscrapers, Lot fragmentation, Agglomeration economy.
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1 Introduction

Cities are the center of economic activities, and thus, the efficient use of scarce land in a city's central business district (CBD) can have a sizable impact on the functioning of the economy. Furthermore, as the structure of economic activities evolves over time, it is important that land is allocated to the best usage at each point in time. For example, there will be a higher demand for large office buildings when firm activities grow.

One key type of land transaction to construct a certain size of building is to change the lot size by either split or assembly; however, transaction costs may exist with the effect of preventing optimal use of land. On the one hand, splitting land may be costly, because it may involve demolishing the buildings and finding multiple buyers for the split land. On the other hand, assembling land may also be costly, because it involves multiple landowners.

The presence of such transaction costs implies that lot size can affect urban development in the long run through the following two mechanisms. First, lot size can affect land prices and land development, and this effect can depend on the economic environment. For example, at the initial stage of economic growth, some lots may exceed the optimal size of buildings, but not be split owing to transaction costs. Therefore, larger lots would be discounted in this case. However, once tall buildings become available, some lots may be too small for large footprints of tall buildings, yet transaction costs prevent lot assembly. In this case, larger lots have premia. Second, transaction costs may generate persistence in lot size if they are greater than the benefit of optimal land use. Through a combination of these two mechanisms, lot size affects urban development in the long run, and this effect may vary over time.

This study examines how initial lot fragmentation impacts urban development in the long run in the context of central Tokyo. This study fills an important gap in the literature on the long-run impacts of the initial allocation of lots, which has focused on rural areas. Notably, recent studies using rural areas show that land size is persistent and larger land has negative effects on the economy, although the persistence usually diminishes over time (Bleakley and Ferrie, 2014; Finley et al., 2020; Smith, 2020). However, the extent to which findings in rural areas can be generalized to cities is not clear. On the one hand, cities have a high benefit of optimal land use due to agglomeration economies, which might weaken the lot size persistence. On the other hand, transaction costs can be higher in city areas, possibly because cities tend

to have more heterogeneous land use or the potential benefits of land assembly itself intensifies land owners' strategic behavior in their negotiation of assembly, which may strengthen the lot size persistence. In addition, although large lots usually have a negative effect on land prices in rural settings, large lots may have a positive and larger effect on land prices in the urban setting due to agglomeration economies.

We analyze land use and values in Tokyo over a 150-year period. Several features of Tokyo make its setting an ideal laboratory for studying the long-run effects of the initial lot size. First, there is a natural experiment that, in our view, offers the closest analog to exogenous releases of land with larger lot sizes on a large scale throughout central Tokyo. During the feudal era before 1868, 20% of the land in Tokyo was occupied by daimyo. Daimyo were among the top of the samurai (warrior) class in Japan and governed their local domain outside Tokyo as feudal local lords, but had to own estates in Tokyo (*daimyo yashiki*) for political reasons, which we explain later in the background section. These estates were much larger than the lots in the other areas in Tokyo. However, after the Meiji Restoration in 1868, these local lords were forced to release their estates into the private market. In this study, for cleaner identification, we exploit a clear discontinuity in a particular central Tokyo area due to the central government's zoning before 1868. Specifically, around the beginning of the 17th century, the Tokugawa shogunate, Japan's feudal military government that preceded the Meiji period, designated the western half of newly developed areas to local lords' estates and the eastern half to commoners. When the Shogunate further reclaimed land to the east, the newly reclaimed land became the local lords' estate zone. These newly developed areas were in lowlands close to the seashore at the time, and therefore, are likely to share similar characteristics.

Second, Tokyo provides the historical and modern datasets necessary for our study. We can keep track of land prices or lot fragmentation over time after the Meiji Restoration, when the modern property system was introduced. We can also measure the locations and heights of all buildings in today's Tokyo. Third, Tokyo is one of the largest and most active cities in the world and, after World War II (WWII), it experienced changes in its economic environment, making skyscraper construction possible. This enables us to study the nature of lot persistence in an urban setting under different economic environments.

To pursue both the external and internal validity of our results, we use both ordinary

least squares (OLS) with geographical control variables for the full sample and regression discontinuity (RD) design using the clear zoning boundary for a particular area of the sample. The results of both approaches consistently show lot size persistence: the presence of local lords before 1868 results in larger lots in 2011. We also find that larger lots facilitate urban development today: these areas have taller and fewer buildings, more floor space, and higher land prices. This is in contrast to the prediction of Coase theorem without transaction costs, whereby the initial allocation of property rights does not affect long-run outcomes. We also examine the effect of local lords' estates on firm productivity using firm-level micro data with OLS and RD analyses, finding a positive effect on revenue per worker, which is a proxy of total factor productivity (TFP). Furthermore, we find that this effect is higher in the upper quantiles, and firm productivity does not predict whether firms will move within, enter, or exit from the areas of the local lords' estates. This implies that the effect on firm productivity is through the agglomeration benefit channel, rather than the exit of less productive firms (the selection channel).

To investigate the nature of lot size persistence, we compare the heterogeneous effects between the central area and the non-central area.[1] We find that lot size persistence exists only in the central area in both the OLS and RD analyses. Because the central area would have a higher benefit of assembly, which would weaken the lot-size persistence, this result suggests higher transaction costs to assemble land in the central urban area. Although the data and setting do not allow us to pinpoint the exact mechanism, this effect is likely to be explained by the hold-out problem, a common problem in land assembly pointed out in the literature (Miceli and Sirmans, 2007; Brooks and Lutz, 2016): higher potential gain of assembling land intensifies landowners' strategic behavior in their negotiation of assembly. This explains why we find strong lot size persistence for 150 years, unlike studies using rural settings. In addition, we find impacts on buildings or land prices only in the central area, implying that lot size is the major channel of the effect of local lords' estates on those variables.

Next, we analyze the mechanism by which lot size affects land prices. We find a positive effect on land prices in the 2010s, but the sign of this effect may change depending on the technological environment, such as the possibility of constructing skyscrapers. To investigate

[1]For the OLS, we define the area inside the *Yamanote* loop line as the central area. Its area, 60 km^2, roughly corresponds to the area of Manhattan. For the RD analysis, we separate the border line into two parts: close to and far from the central area.

this point, we examine the effect on lots and land prices before WWII, when Tokyo had no skyscrapers and industries were less knowledge based. We find that local lords' estates decreased the number of lots, but had *negative* effects on land prices. We also find that the effect on land prices became zero in 1972 and turned positive in 1983. This means that before WWII, there were split frictions: lots in local lords' estates were too large for optimal land use, but were not split owing to split costs. However, after WWII, these large lots obtained advantages from technological change (i.e., increased high-rise buildings and the emergence of skyscrapers and the transition to the knowledge economy) and assembly costs. This suggests that the value of a large lot can change according to the technological environment (i.e., positive effects arise only after the 1970s with increased high-rise buildings). This also suggests that the positive effect on land prices in the main results is not driven by time-invariant location-specific effects.

To investigate the role of tall buildings more explicitly, we focus on more recent changes in the heights of buildings over the past 25 years. Both OLS and RD analyses show weaker effects on firm productivity in 1993, when Tokyo had fewer skyscrapers, than in 2017. This difference between 1993 and 2017 is attenuated when we control for the height of buildings. These results imply the height of buildings as an operating channel.

Finally, we conduct additional analyses to identify other potential channels to explain the causal link from local lords' estates to land prices. For example, lower transaction costs might have facilitated public infrastructure construction and increased amenity. Also, larger lots might have alleviated destruction during WWII and affected subsequent land development. Furthermore, the presence of local lords' estates might affect land price by changing the size of the blocks (area surrounded by roads), the floor–area ratio (FAR) regulation, or initial land price in the 1860s. Although we do not exclude these channels, we find that controlling for these factors does not change the main results qualitatively. We also consider alternative channels to explain the change in the sign of the effect on land price changes after WWII, such as land-use change or owner change caused after WWII, but none of these alter the results.

Our study contributes to the literature on the persistent effects of initial lots or land holdings. Studies using rural area settings show that land size is persistent and larger land has negative effects on the economy, but the persistence usually diminishes over time (Bleakley

and Ferrie, 2014; Finley et al., 2020; Smith, 2020).[2] Meanwhile, we examine an urban setting in which larger lots may have large benefits by the construction of tall buildings. This setting can result in different consequences; persistence may disappear, because benefits will be larger than the assembly cost if the cost is constant or lot size persists because the land assembly gain may intensify assembly costs, possibly due to hold-out problems. We find that lot size persistence does not dissipate even after 150 years, and we find persistence only in the central Tokyo area. This suggests that transaction costs are higher in the urban central area, possibly because the high demand for floor space and tall buildings increases assembly costs. This also explains the different results between our study and those of other studies.

We also contribute to the recently growing literature on the height of buildings (Liu et al., 2017; Ahlfeldt and McMillen, 2018; Ahlfeldt and Barr, 2020). We investigate the obstacles to constructing high-rise buildings (Barr et al., 2011), which is the key to enhancing the benefits arising from the density of economic activities (Ahlfeldt et al., 2015). We offer a unique contribution to the literature by showing a very close link between lot fragmentation and tall buildings. Because lot fragmentation prevents the construction of tall buildings, the cost of lot fragmentation becomes more salient with the availability of construction technology for tall buildings.

Our study also offers a perspective on the conflicting results found in studies of land assembly and land prices. Such studies as White (1988) and Brownstone and Vany (1991) find a negative premium, while Tabuchi (1996) and Brooks and Lutz (2016) find a positive premium. Our study examines the relationship between lot size and land prices based on a natural experiment and compares the relationship in different periods and locations to shed light on how lot size premia arise.

Our study belongs to the expanding literature that analyzes cities with historical datasets (Hanlon and Heblich, 2020), such as Davis and Weinstein (2002), Bleakley and Lin (2012), O'Grady (2014), Ambrus et al. (2015), Redding and Sturm (2016), Baruah et al. (2017), Hanlon (2017), Heblich et al. (2017), Hornbeck and Keniston (2017), Dericks and Koster (2018), Brooks and Lutz (2019), and Harari (2020). Our study offers a new channel through which history matters: historically determined lot size differences persist, but the positive

[2]Libecap and Lueck (2011) compare two land demarcation regimes, metes and bounds and the rectangular system in Ohio, finding a positive impact of the rectangular system on farmland value.

effect of lot size develops only after the rise of the knowledge economy and the development of construction technology.

The rest of this paper is organized as follows. Section 2 provides background information on land use in Tokyo. Section 3 describes the data and the empirical strategy. In Section 4, we present the results. Section 5 concludes and outlines plans for future analyses.

2 Background

We first describe the historical background in each period (1600–1868, 1868–1945, 1945–), and then explain the related regulations and anecdotes.

2.1 During the Edo Period: 1600-1868

Tokyo, which was called Edo during the Edo period (1600–1868), is one of the most prosperous cities in the world, but it was not a big city prior to the Edo period.[3] A local lord constructed Edo Castle in 1457, but Edo remained a small town, surrounded by a marsh.

This situation changed in 1590, when Tokugawa Ieyasu, one of the most powerful feudal lords of that time, was transferred to Tokyo. He reconstructed the castle to strengthen his military capacity and reclaimed the inlet in front of the castle to expand the land. He also seems to have adopted class-based zoning inside the outer moat (the "inner area").[4] The area closest to the main gate on the east side of the castle was used for estates of local lords, who govern their own local domains outside Tokyo. The east side of this area was allocated to Tokugawa's officers and to commoners as business districts. Importantly, local lords were among the highest rank of the samurai class, and therefore, local lords' estates were on average larger than other buildings used by officers (lower-ranked samurai) or commoners. We exploit the clear zoning on the east side of the castle for the RD design (the dash-dot line in Figure 1(a)). Tokyo became political capital after Tokugawa won significant wars in 1600 and 1615, and his government (Shogunate) ordered all local lords to have estates in Tokyo for political interactions.[5] As a result, the Shogunate further reclaimed land and allocated a

[3] See Kawasaki (1965), Suzuki (2000), and Matsuyama (2014) for more detailed historical context.

[4] Other local lords often adopted planning systems in their castle cities.

[5] In particular, the demand for land grew because Tokugawa required that all local lords (approximately 250) alternate between living in Tokyo and their local domains, and that their families stay in Tokyo as hostages. These policies significantly increased the demand for local lords' estates.

new area for local lords. Therefore, the initial coastline (the solid line in Figure 1(a)) became a boundary between the local lords' estates zone and the commoners' zone, except in the northwestern part, where some local lords' estates were located by chance on both sides (the dash-line in Figure 1(a)). This is another discontinuity in our identification strategy. The Shogunate also developed an area outside the outer moat (the "outer area"). In the outer area, the local lords chose the location for their estates and had to ask permission from the Shogunate to use the land. In that sense, the Tokugawa shogunate controlled urban land use. However, unlike the inner area, there is no indication of a clear zoning policy.

Although local lords could swap their estates with other lords, the social class of land users for each land area seems to have been quite stable until the end of the Edo period in 1868. Local lords' estates occupy about 20% of the land in Tokyo as shown in a map in the 1850s (Figure 2). Tokyo experienced significant economic and cultural growth during the Edo period, and its estimated population at the end of the 1860s was about 1 million.[6]

[Figure 1 about here.]

[Figure 2 about here.]

2.2 Meiji Restoration and Pre-WWII: 1868-1945

A commonly held view among historians is that the Meiji Restoration caused a significantly negative shock on Tokyo's economy. After the collapse of the Tokugawa shogunate, local lords were no longer required to stay in Tokyo, and their estates became vacant. Around half of Tokugawa's officers moved to Shizuoka, where Tokugawa was transferred to, and about 150 km away from Tokyo. As a result, the samurai class, which occupied a large proportion of the Tokyo population, migrated out of Tokyo and its economy, which had previously been sustained by the samurai class, collapsed. Moreover, part of Tokyo became a battlefield (during the Battle of Ueno) in the civil war during the Meiji Restoration. Due to this economic turmoil in Tokyo, it was uncertain which of Tokyo, Osaka, or Kyoto, three important economic and political cities, would become the new capital of the Meiji restoration. Finally, the new

[6]There are many estimates of the population of Edo, but most estimates range from 1 million to 1.5 million. See, for example, Kito (1989).

government chose Tokyo as its capital, and Tokyo began to grow economically as the nation's modern economy took off. In that sense, the Meiji Restoration is regarded as the initial point of modern Tokyo's economic growth.

Local lords typically held three estates during the Edo period, but the Meiji government allowed local lords to own just one estate in Tokyo, and confiscated the others. In the very central area, Kasumigaseki, the Meiji government transformed these estates into government offices or training fields for the army. The Meiji government sold or gave the remaining estates to the private sector.

There was continuity in the lot boundary between the periods before and after the Meiji Restoration. Along with these land transformation processes, the Meiji government introduced a modern property tax system (*chiso kaisei*) and determined the boundaries of lots based on the land usage before the Meiji Restoration. Therefore, the local lords' estates retained their large lot in the early Meiji period.

2.3 After WWII: 1945–

After 1945, the descendants of local lords experienced significant policy shock. Despite the regime change in 1868, local lords retained their political elite status as noblemen (*kazoku*) and possessed privileges, such as seats in the house of peers. However, in 1946, the General Headquarters introduced a very high asset tax to remove the political and economic elites supported by Imperial Japan. In addition, the General Headquarters deprived the elite of their political and economic privileges. There are many anecdotes of local lords being required to sell their properties to pay the asset tax (Sakai, 2016). Consequently, most of the former local lords' estates became owned by the private sector in this period, with the exception of those in the Kasumigaseki area.

After Tokyo became the capital of Japan, its population recovered and began to grow. In the eight wards of central Tokyo, the residential population, which had been 0.46 million in 1883, rose to 2.17 million by 1920. After WWII, the population became stable (in 2015, it was 1.95 million), but the daytime population (number of people present during normal business hours) has been increasing (2.95 million in 1955 vs. 4.72 million in 2015), implying that business activities have continued to expand. Old Tokyo is now the central business district

of Greater Tokyo, which has about 38 million inhabitants and is the biggest megalopolis in the world.

Post-WWII economic growth increased the demand for high-rise buildings. In 1952, the government deregulated the height restriction that had prohibited buildings over 31 m since 1919. In 1968, the first skyscraper, the Kasumigaseki Building, was constructed. The number of buildings over 30 stories has been increasing in Tokyo's 23 wards, rising from 32 in 1990 to 86 in 2000 and 260 in 2010.

2.4 Anecdotes of High Assembly Cost

Several anecdotes suggest the presence of high assembly costs, consistent with our argument. A large conglomerate, Mitsui, was originally an exchange trader and *kimono* trader in the Edo period and held a small lot as its head office in a former commoners' area in the CBD (Muromachi). After Mitsui became a large conglomerate, it planned to assemble lots nearby to expand its headquarters, but it did not succeed and faced opposition by landlords. They finally completed the planned assembly in 1969, but lots in Muromachi are fragmented.

Meanwhile, a former local lords' estates area in the CBD (just about 1 km from Muromachi) has been owned by another large conglomerate, Mitsubishi, since the 1890s, when it bought the land from the government. Lots are larger than in Muromachi, and there have been large-scale developments, such as Western-style brick buildings before WWII or skyscrapers today. Comparing these two close but different areas, Washizaki (2015) suggests that lot fragmentation is a potential reason for the low number of skyscrapers in Tokyo.

As another example, Mori Building Company planned a large-scale (5.6-ha) re-development in Akasaka in 1967 and obtained a small lot. Although the government approved the plan, it was not until 1983 that it could obtain permission from landlords and start construction of the building (Akasaka ARK Hills). In 1986, the building finally opened. It planned a similar redevelopment in 1986, and it took 17 years to open the building (Roppongi Hills). The former CEO looks back on these developments as a project that would have been impossible if the company had not been family owned or long sighted (Mori, 2009).

3 Data

We constructed a 100 m*100 m cell-level dataset spanning 150 years based on scanned printed maps and other electronic data.[7] We constructed the dataset within the old Tokyo's (Edo's) city area, which covers and remains the center of economic activities in Tokyo during the Edo period. Among Japanese listed firms with their headquarters in Tokyo, the headquarters of 72% of firms are located in our sample area.[8] In this section, we present a table with definitions of the main variables and their sources (Table 1) and briefly explain the sources of the main variables. Panel A in Table 2 shows the descriptive statistics. For firm-level micro data, we do not aggregate the data at the cell level to analyze firm-level locational or entry/exit choices and/or use firm-level information (i.e., industry) as control variables. Panel B in Table 2 shows the descriptive statistics in 1993 and 2017.

Land Usage before 1868 We digitized a map showing land ownership in the 1850s (Kageyama et al., eds, 1849-1862). This map documented the types of ownership for each lot (local lords, bureaucrats, commoners, and other owners, e.g., temples).[9] Figure 2 plots local lords' estates, showing they are well distributed across Edo city. Based on this map, we calculated the share of land owned by local lords for each cell.[10]

Lots Cadastral maps are available for 1869, 1876, 1912, 1931, and 2011 (Nishikawa and Nishikawa, 1880; Ichihara, ed, 1876; Tokyo Shiku Chosakai, 1912; Seizusha, ed, 1931-1935; TDi and Inc, 2017). We digitized or used these maps to calculate the number of lots within a cell.

Land Prices Before 1945, land prices were available for 1876, 1912, and 1931. The 1876 map can be connected with the land price list published later (Nakai, ed, 1880) using the

[7] This cell size roughly corresponds to the median of area of local lords' estates (13845 m^2).

[8] *Source:* `http://disclosure.edinet-fsa.go.jp`. These firms with headquarters in our sample area account for 35% of the total number of firms in Japan.

[9] We used georeferenced images of this map for digitization.

[10] An alternative and perhaps more natural treatment variable is the number of lots in the 1850s, but the map describes only blocks (area surrounded by roads) in the commoners' area without lot boundary, and thus, we cannot count the number of lots from the map. Instead, in the robustness check, we employ the maximum lot size of local lords' estates as an alternative treatment variable.

addresses.[11] The cadastral maps in 1912 and 1931 list the land prices for each lot. These lists have land prices (and land rental prices for 1931) so that we can calculate the area-weighted average land price for each cell.

These land prices are based on evaluations used as the basis for land tax. Evaluation of each lot in the 1860s–1870s referred to the market land price used in the Edo period. However, for land owned by local lords and bureaucrats, there were no market transactions during the Edo period. For this land, the price when the land is sold to the private sector by auction was used. When such land was transferred for free, the neighbor's land prices sold by auction to the private sector were used.[12]

In 1910, the government updated the land prices in cities using market land rental prices, and the data in 1912 contained this land price. The rental price was multiplied by 10 to calculate the land price. If it exceeded the previous land price by more than 18 times, the land price was reduced to avoid a drastic increase in the tax burden for landowners. In 1929, they again updated the land prices by simply using rental prices, which contained data for 1931.

After 1945, the government started to use a different tax system. It first evaluated the place value at the road level and then multiplied it by the lot-specific factors, such as shape. Because lot-specific factors automatically are related to lot size, the road-level price is suitable to capture the effects of lot size on economic activities. The data in 2012 (Research Center for Property Assessment System, 2012) contain this road-level price, and we calculate the length-weighted average land price data within a cell.

These variables before the 1980s are not easily available, and thus, we complement the land price data in 1972 and 1983 by using Tokyo-to Takuchi Tatemono Tohirikigyo Kyokai (1972) and Tokyo-to Takuchi Tatemono Tohirikigyo Kyokai (1983). These maps produced by the real estate agents' association record the estimated market value of land per area at each place.

[11] Some areas changed the address system during these periods and we could not match all of them. This resulted in significant missing values for land prices in 1876 in the dataset. In addition, the maps in 1912 and 1931 cover slightly different areas from the area covered by the map during the Edo period. See Figure A.1 for the heatmaps of the land price variables.

[12] There might be concern that local lords' estates were priced differently for political reasons. However, this way of selling their land suggests that the land price fairly reflects the market value fairly (Fukushima, 1962). We also analyze whether such political consideration might change our results using whether landowners are former local lords' descendants in the landowner characteristics data of 1931.

Buildings The Tokyo Metropolitan Government has been producing an electronic map covering all the buildings and land usage in Tokyo every five years since 1986 for urban planning (Tokyo Metropolitan Government, 1986, 1991, 1996, 2001, 2006, 2011). From these maps, we calculated the number of buildings, total floor area provided, and average number of stories. We also confirmed the positive relationship between the number of stories and footprints of buildings using data in 2011.[13] In addition, the government has been making electronic maps for land usage, from which, we calculated the share of land used for business or residence.

Geographies We used geographic variables as control variables, because geography may affect the supply of buildings (Saiz, 2010) and determine the location of local lords' estates. Altitude data are available from the Ministry of Land, Infrastructure, Transport and Tourism (2014). We calculated the average and standard deviation of altitude in a cell: higher places may attract richer people, and flatter places may be suitable for large-scale development. We also controlled for earthquake risk. Tokyo Metropolitan Government (2018) assesses several types of risk (e.g., building materials) at the community level, and we used the risk resulting from the type of ground to focus on purely geographical risks. We took the area-weighted average of these community-level risks at the cell level.

Before discussing the regression analysis results, we illustrated our analysis using raw data for an area around a station in the CBD. Figure 3(a) shows the original data source. Figure 3(b) shows the distribution of local lords' estates using red-hatched polygons. We overlaid the cadastral map of today with the Figure 3(c) and found that former local lords' estates are associated with larger lots today. When we overlaid today's tall buildings with Figure 3(d), most of the tall buildings were found to be located on land that was former local lords' estates. In the regression analysis, we confirmed these relationships using the whole sample while considering potential endogeneity bias. When we examined the aerial images of the area using Figure 3(e), we observed a great deal of variation in the height of buildings in this small area, suggesting high land assembly costs.

[13] See Figure A.2. We might think that this relationship is sorely due to earthquake risk in Japan and cast doubt on external validity. However, we observe a similar pattern between building height and footprint in New York: using the height and footprint data, we plot them in a similar manner with Figure A.2. It shows the positive relationship between footprint and height. Moreover, assuming 4m per story, the 120m-or-higher group in NY corresponds to the 30-stories-or-higher group in Tokyo, both of which have very similar percentile of footprint. See Figure A.3.

Firm-level Micro Data To analyze firm-level productivity and firms' locational or entry/exit choices, we used a firm-level dataset in our sample area. We obtained the data through the Teikoku Databank Center for Advanced Empirical Research on Enterprise and Economy (TDB-CAREE), at Hitotsubashi University. Teikoku Databank is a major Japanese credit research company, and this dataset covers most Japanese firms. These data contain basic information, such as industry, locations of headquarters, and the number of workers and revenue, so that we could construct revenue per worker, a proxy of TFP.

[Table 1 about here.]

[Table 2 about here.]

[Figure 3 about here.]

4 Results

We first show the main results analyzing the effect of local lords' estates on the outcomes of lots, buildings, and land prices in our modern data. We also present the results using firm-level micro data. Then, we analyze the nature of persistence and the lot size effect, the role of tall buildings, and other possible mechanisms that might explain the main results.

4.1 Main Results

OLS using the full sample Table 3 shows the baseline results from the OLS regressing the outcome variables on the local lords' estates share variable. Distance from the center is associated with a reduction in local lords' estates and will affect urban development; therefore, we control for this variable as a baseline specification in Column (1). Panels A and B show that the greater the proportion of local lords' estates, the fewer lots are fragmented, both for 1872 and 2008–2011. The point estimate shows that if a cell is occupied by local lords' estates, it decreases the number of lots in the 2010s by 23.29, about half of the mean, implying substantial lot size persistence.

In Panels C to E of Table 3, we find negative impacts on the number of buildings and positive impacts on the number of stories and tall buildings. The decreased number of buildings implies that large-scale developments with greater footprints are more common in areas that used to be local lords' estates. The point estimate for the number of buildings more than or equal to 30 stories is 0.039, which is about the same size as its mean.[14] In Panel F, we find that land prices increase as predicted. The point estimate shows a large impact: if local lords' estates occupy a cell (corresponding to a reduction in the number of lots by 23.3 in 2011), it increases the land price by 33.8%.

In Columns (2) of Table 3, we control for key geographic variables, the distance from the center (Edo Castle or today's Imperial Palace) and altitude (mean and standard deviation). We add the mean and standard deviation of altitude as higher places may attract richer people, whereas flatter places may be suitable for large-scale development. In Column (3), we control for longitude and latitude polynomials to exploit more local variation. In Column (4), we also control for earthquake risk, which would affect the construction cost and the decision to build high-rise buildings. The results remain largely unchanged by these additional controls. We also consider spillover effects from adjacent cells, but the qualitative results do not change.[15][16][17] Overall, these results indicate lot size premia and the presence of assembly costs.

[Table 3 about here.]

[14]The point estimate on the number of stories is just 0.8, but this is the result of a mix of positive and negative effects. When we run a quantile regression, in the 10th percentile, the point estimate is about –0.3, suggesting that some local lords' estates became more low-rise housing areas. However, in the 90th percentile, which is more relevant for our study than in the lower percentiles, the point estimate becomes 4.3, as predicted. See Table A.1 for the results for the other percentiles and the results with control variables.

[15]It is natural to expect positive spillover effects from adjacent local lords' estates, and if local lords' estates are spatially correlated, this would bias the coefficient in the main results. Note that it does not alter the general interpretation that local lords' estates prevent lot fragmentation and increase skyscraper construction and land prices. Still, we investigate spillover effects by adding local lord's estate variables defined by a larger square (e.g., 3*3 cells) to the main specification. Table A.2 shows that the spillover effect exists up to 3*3 cells (100–140 m from each cell) in most outcome variables. One exception is the result of the land price, which is unstable, but may suggest a spillover effect reaching farther. From this finding and to address the concerns discussed in Kelly (2019), we examine the robustness of the main result against the choice of threshold for spatial correlation in error terms, but the results are mostly robust even when we extend the threshold to 500 m or 1000 m, as shown in Table A.3.

[16]To check the robustness against the specification of treatment variable, we also use the max of lot area (km2) of local lords' estates in each cell. The results are presented in Table A.4, showing qualitatively the same results.

[17]As a further robustness check, in Table A.5, we show the coefficient stability using a method developed by Oster (2019). We find that unobserved confounders do not alter the signs of the estimated effects.

Exploiting Historical Zoning Policy As another identification strategy, we exploit a historical zoning policy to conduct a local randomization analysis, as briefly explained in the background section. Figure 1(a) shows the central Tokyo area, some of which the Tokugawa shogunate developed via reclamation. At the initial declamation, the shogunate developed the land to the eastern part of the U-shaped line, the dash and solid part, which became the initial coastline. At the same time, the shogunate clearly set the dash-dot part of the U-shaped line as a boundary between the local lords' estates zone and commoners' zone, although we are not aware of formal documents specifying this zoning. The estates shown with a red border are obviously larger than the lots to the east of the dashed line, the commoners' zone. After the increase in demand for land by local lords, the shogunate further reclaimed the area to the east of the initial coastline, reaching today's Sumida River. These areas were occupied largely by local lords. Therefore, the initial coastline became another boundary between the local lords' estate zone and the commoners' zone, and as a whole, the U-shaped line works as a boundary between the two zones except the northeastern dash part without gray-colored buffer in Figure 1(b), where local lords' estates happened to be located in both zones. In Figure 1(b), we also overlay high-rise buildings in 2011, indicated by the black (more than or equal to 30 stories) and gray (15–29 stories) rectangles, and we observe that they are mainly located in the local lords' estate zone.

We first rely on graphical representation using the sample average and a polynomial regression, as shown in Figure 4, to examine the distribution of variables. We use cells whose centroids are within 1 km of the boundary, but exclude cells whose centroids are within 50 m of the boundary, because such cells are separated on both sides and attenuate the jump (if any) at the discontinuity. The x-axis is the distance from the boundary, taking a positive and negative value in the local lords' estate zone and commoners' zone. Panel A shows a clear discontinuous jump in the presence of local lords' estates. Panels B and C show the mean and standard deviation of altitude respectively. Panel B shows no clear discontinuity at the boundary in the mean of altitude. Panel C shows some discontinuity at the boundary in the standard deviation of altitude, but higher ruggedness is disadvantageous to development, and thus, the simple RD design does not overstate the positive effects on development. We check the robustness against controlling for these variables in the regression analysis. Panels D–F

show that the western area has fewer lots, more high-rise buildings, and higher land prices.[18]

For the regression analysis, we employ a local randomization approach, because we do not have a large sample along the boundary (Cattaneo et al., 2019).[19] We use the cells whose centroid is within 250 m of the boundary, corresponding to about one block from the boundary, which is shown as the gray-shaded area in Figure 1(b). We do not use the boundary in the northeastern part for this analysis (the dashed-line without gray-shaded buffer), because some local lords had estates along the intimal coastline. We define a *Local Lords' Estates Zone* dummy by the location of the centroid and regress the outcome variable on this dummy and other controls. Table 4 shows the results. In Column (1) of Panel I, we regress the share of local lords' estates on the *Local Lords' Estates Zone* dummy, which confirms the expected large impact.[20] Column (2) adds the distance from the center and whether the centroid is on the western or eastern side of the overground railroads (also shown on the map), because overground railroads often divide economic activities. Column (3) shows controls for other geographical variables, the mean or standard deviation of altitudes, and earthquake risk. The results are similar across the specifications. In Panels A–G, we find a very similar pattern to that shown for Panels A–G in Table 3. Again, there is a negative effect on the number of lots, implying lot size persistence, and a positive effect on high-rise buildings. The effect on land price is not statistically significant, unlike in Table 3 because of higher standard errors. We analyze the effect on firm-level productivity in the next section, which gives us more precise and direct evidence of the effect on firm productivity. Another finding is that the point estimates for high-rise buildings and land prices are larger in magnitude than those in Table 3. This is because this area is the most central part of the CBD, and the agglomeration benefits from constructing high-rise buildings are larger.[21]

[Figure 4 about here.]

[18] The plot of land prices within about 500 m of the boundary suggests the presence of positive spillovers arising from economies of density, which is consistent with spillovers we find in OLS (Table A.2).

[19] We also employ an RD approach using polynomials of distances from the boundary as control variables. Table A.6 shows qualitatively consistent results with the local randomization approach (Table 4), but larger standard errors, as expected.

[20] In the tables showing the RD results, we added Panel I to the top of the panels so that the panel structure is the same with one in the OLS tables.

[21] As a further robustness check, in Table A.7, we show the coefficient stability using the method of Oster (2019). We find that unobserved confounders do not alter the signs of the estimated effects.

[Table 4 about here.]

4.2 Effect on Firm Productivity

To further examine the positive effect of local lords' estates through agglomeration benefits, we analyze the impact on firm productivity using micro data. There are two channels of how local loads' estates affect local-level TFP through high-rise buildings: the selection channel, in which competition becomes tougher and less productive firms exit; and the agglomeration benefits channel, in which firms increase their TFP by knowledge spillovers, a thick labor market, sharing common sources, and so on. If the selection channel is the main driver of the effect on land prices, it does not represent a productivity gain for firms.

We conduct two types of analyses to disentangle these channels. First, we examine the distribution of firm productivity in each cell (Combes et al., 2012). The selection channel generates a cutoff in the lower tail because the least productive firm exits. Meanwhile, the agglomeration benefits channel shifts the whole distribution to the right, and/or the upper tail becomes thicker when productive firms can enjoy the agglomeration benefits more.

Figure 5(a) shows the distribution of firm productivity in 2017 proxied by revenue per worker in cells whose local lords' estates share is zero and one (the solid line and dash line, respectively). We find that the lower tail does not show a significant difference, suggesting a very weak cutoff channel, but the upper tail becomes thicker in the local lords' estates zone. We find a very similar pattern when we compare firms in the local lords' estates zone and the other zone using firms close to the boundary, as in the local randomization design (Figure 5(b)). Quantile regression analysis with inclusion of the other cells in the sample and controlling for other variables (controls in the main analysis and industry fixed effects) confirm this pattern, with a larger effect in the upper tail (shown in Figure 6(a) and Figure 6(b)). These results imply that local lords' estates contribute to productivity gains for firms mainly through agglomeration benefits.

Second, to investigate the selection channel, we use the panel structure of the dataset. We identify firms that change their location within our sample area (mover), and firms that exit or enter our sample area after 1993 (entrant/exiter), which is the oldest year in our available dataset. The selection channel can operate at two margins, moving within our sample area

and exiting or entering our sample area. Using movers, we investigate the former margin by regressing the change in local lords' estate share on initial productivity using movers. Panel A in Table 5 shows that more productive firms are not significantly selected into the high local lords' estate share area. This result does not support the presence of a selection channel in this margin. For the latter margin, we compare entrants with the other firms in 2017. We find that new firms are less productive, but this pattern does not change in the high local lords' estates share area (columns (1)–(3) in Panel B). Similarly, when we compare exiters and the other firms in 1993, less productive firms are more likely to exit from our sample area, but this pattern does not change across areas (columns (1)–(3) in Panel C). These results suggest that the selection channel does not operate in either margin.[22]

These two sets of results indicate that the presence of local lords' estates contributes to firm productivity through the agglomeration benefit channel, which is a pure gain for firms.

[Figure 5 about here.]

[Figure 6 about here.]

[Table 5 about here.]

4.3 Mechanisms

4.3.1 Pattern of Persistence

The main results indicate lot size premia and the presence of assembly costs. To examine the nature of the assembly costs, we split the sample into the central area and outside the central area. The central area is more affected by the emergence of skyscrapers or the transition to a knowledge-based economy. This could result in two scenarios. If land assembly costs are constant, we would find weaker persistence in the central area, because there would be enough benefits by assembling land and constructing skyscrapers to cover the assembly costs.

[22]Table A.8 analyzes the move from or to local lords' estates zone and entry and exit from our sample area for local randomization. The results are similar to those of Table 5, finding little evidence of the selection channel.

However, if land assembly costs are not constant and higher in the central area, for example, by the hold-out problem, we might find stronger persistence in the central area.

We investigate the heterogeneous impacts between the central and non-central areas in our OLS and RD analyses. For the OLS analysis, we split the sample into the central area and outside the central area using the *Yamanote* loop line and execute the regression analysis as in Table 3. This loop-line railway connects terminal stations in Tokyo, and the area inside the circular line is generally recognized as the center of Tokyo. Table 6 shows the results. In columns (1) and (2), we use a 300-m buffer from the loop line to define the inside and outside of the central area. We find that the number of lots in 1876 is lower in both samples (Panel A), but the lot size persists only in the central area (Panel B). Accordingly, we find positive impacts on tall buildings and land prices only in the central area (Panels C–F). This result implies that the effect of local lords' estates on buildings or land prices today comes through lot size persistence.

This pattern does not alter when we change the 300-m buffer to a 1000-m or 2000-m buffer in columns (3)–(6). We also examine this pattern using the local randomization design by estimating the effect of the coastal boundary far from the central area and the non-coastal boundary close to the central area separately (Table 7).[23] Again, we find lot size persistence and effects on buildings or land prices only in the central boundary, although both show initial effects on the number of lots.

These results imply that land assembly costs are not constant and are higher in the central area, which explains why we observe persistence even after 150 years, unlike other studies using rural areas (Bleakley and Ferrie, 2014; Finley et al., 2020; Smith, 2020). Although we cannot determine the exact reason for this, the hold-out problem is a potential explanation. In addition, because split costs will be similar across spaces, the presence of split costs will not be enough to generate the 150-year persistence in the number of lots, highlighting the relative importance of assembly costs.

[Table 6 about here.]

[Table 7 about here.]

[23] See Figure A.4 or Figure A.5 for the graphical representations in each boundary.

4.3.2 Nature of Lot Size Effect: Role of Skyscrapers

Before the prevalence of skyscrapers or transition to an office economy, there would have been fewer agglomeration benefits. If so, and if there were no split costs, smaller lots would be appreciated, and large lots might split.

To analyze this point, we use cadastral map and land price data before the 2010s when there were fewer skyscrapers. We examine how local lords' estates affected lot fragmentation and land prices in 1876, 1912, 1931, 1972 and 1983 using the same set of specifications as in Table 3 (OLS) and Table 4 (RD). We graphically show the results with the baseline control variables, as shown in Figure 7.[24] The point estimates show that even though local lords' estates had negative effects on the number of lots before WWII (Figure 7(a)), and affected land prices *negatively* before WWII (Figure 7(b)). In 1972 and 1983, when high-rise buildings became more common, the effect on land prices increased to around zero, and in the 2010s, when there were many skyscrapers, there was a clear positive effect. This pattern is particularly prominent in the RD analysis using the boundary in the central area (see Figure 8 for a graphical representation).[25] These findings yield two conclusions about lot size and land price relationships: (1) before WWII, smaller lots were preferred, but there were substantial split costs generating lot size persistence compared with the main results; and (2) technological progress after WWII (the development of construction technology for high-rise buildings and the transition in production from factories to offices) changed the relationship between lot size and land prices.

[Figure 7 about here.]

[Figure 8 about here.]

Although the results above show a stark difference between the periods, there may be changes in those 150 years other than the emergence of skyscrapers or the knowledge-based economy to explain the difference. To investigate the role of tall buildings more explicitly, we focus on more recent changes in the heights of buildings over the past 25 years. We

[24] See the regression results with other specifications for Table A.9 (OLS) and Table A.10 (RD). We find qualitatively similar results across the specifications.

[25] See Figure A.6 and Figure A.7 for graphs using both boundaries and the non-central boundary only.

compare the effect on firm productivity in 2017 and 1993, when there were fewer skyscrapers in Tokyo.[26][27] Using the same specification as Figure 6, we find that the effects are smaller in 1993 (shown as triangles in Figure 9(a)) than in 2017. In addition, once we control for the average number of stories, the effect of local lords' estates attenuates and the difference between 2017 and 1993 becomes smaller (Figure 9(b)). We find a similar pattern when we employ the local randomization design (Figure 9(c) and Figure 9(d)).[28] Although the analyses are not free from the bad control problem, this provides suggestive evidence that local lords' estates contribute to a productivity gain for firms through agglomeration benefits in high-rise buildings.

[Figure 9 about here.]

4.3.3 Other Possible Mechanisms

The results above support the view that local lords' estates increase lot size today, facilitate skyscraper construction by decreasing transaction costs of assembly, and increase the land price. We consider alternative channels to explain the link between local lords' estates and land prices.[29]

First, transaction costs may be relevant in the public sector. For example, large lots may facilitate the construction of transportation infrastructure (wider roads, proximity to railroad stations) or buildings for the public sector (hospitals, universities, or parks), which would increase the land price. We consider these channels by controlling for average road width, the share of land used as hospitals, universities, and parks, or distance to the nearest station in

[26]The effect of local lords' estates on skyscrapers was increasing in these 25 years. See Table A.11 and Table A.12.

[27]We also split the sample into a business zone (more than half of the land is used for business purpose) and a residential zone (similarly defined) to investigate heterogeneous effects. This classification is endogenous, and thus, the results should be interpreted with caution. Table A.13 shows that in both zones, local lords' estates prevent lot fragmentation and encourage large-scale development (Panels A–C), but promote the construction of high-rise buildings only in the business zone (Panels D–E). For land prices, both zones show positive impacts of local lords' estates, and the effect in the business zone is higher in the central area, although the significance varies because of different levels of standard errors. This suggests that the presence of local lords' estates may affect land prices in residential zone through different channels, such as higher amenities arising from less density or the presence of parks.

[28]See Table A.14 and Table A.15 for the corresponding regression tables.

[29]See "Other variables" Table 1 for the data sources of variables to account for alternative channels.

2017 and 1950 for both OLS and RD analyses;[30] however, the main results mostly hold.[31] This suggests that these factors are not the main drivers of the key results.[32]

Second, local lords' estates may facilitate skyscraper construction, but not through lot size. We consider the size of blocks (not each lot, but the area surrounded by roads) as an alternative channel, because it is another constraint for constructing large buildings. Another alternative channel is the FAR regulation because it can affect skyscraper construction.[3334] We add these variables to the main specification, finding that the main results remain largely unchanged.[3536] Similarly, the 1876 low land price in local lords' estates may work as an alternative channel, because it may affect the dynamic path of land use. However, the coefficient of local lords' estates changes little when controlling for the land price in 1876 in the OLS and RD analyses.[37]

Overall, these channels may exist in the causal chain from local lords' estates to land prices, but they do not fully explain the main results.

Next, we consider alternative historical shocks which might explain why we observe persistence only in the central area or the sign of the effect on land price changed. We first consider the destruction during the WWII bombing. This might be concentrated in the non-central area and affect lot size persistence. Also, it might affect the change in the land price after WWII. However, the results unchanged when we control for the share of destructed area.[38]

[30] Demolished stations can have persistent effects, as shown in Brooks and Lutz (2019).

[31] See Table A.16 and Table A.17 for the OLS and RD results. The effect on land price is less significant in the RD design, but the central area shows significant signs in Panel G of Table A.17.

[32] These factors may affect firm productivity as well. We include these variables as additional controls, and confirm that the main results hold. See Table A.18 and Table A.19.

[33] Note that the FAR regulation may be loosened by increased demand for skyscrapers, and thus, it may just exist in the causal chain between lot size and skyscraper in the main results rather than as an alternative mechanism.

[34] Before 1919, there were no height restrictions or FAR regulations. However, in response to rapid city growth, in 1919, the government established height regulations, and in 1961, the government switched from height regulations to FAR regulations.

[35] FAR regulations depend on the land-use zones established under urban planning laws and the width of the roads that the buildings face under construction laws. Specifically, when road width x is equal to or more than 12 m, the maximum FAR is equal to that set by land-use zones (FAR_{zone}). When x is less than 12 m, the formula $\min\{FAR_{zone}, x * k * 100\}$ determines the maximum FAR, where $k = 0.6$ ($k = 0.4$) when the land is commercial (residential). For example, suppose that the land-use zone regulation specifies 500% as the maximum ratio. If the road in front of the land is 6 m and the land is commercial, the maximum FAR is reduced to 360%. Although there are some special cases in which $k > 0.6$ due to policies by local municipalities, in the regression analysis, we calculate the road-level maximum FAR using the formula above and use its weighted mean using the length of each road segment as the control variable.

[36] See Table A.20 and Table A.21 for the OLS and RD results. The effect on land price is less significant in the RD design, but the central area shows significant signs in Panel G of Table A.21.

[37] See Table A.22 and Table A.23.

[38] See Table A.24, Table A.25, Table A.26 and Table A.27.

Second, we consider the change in land use caused by the end of WWII. Before WWII, the descendants of local lords still used a part of the estates to live on or for military infrastructure. There should be a significant change in land use in those areas after WWII, which may explain the difference between the central and non-central area or in the sign of the effect on local lords' estates. Similarly, land owned by local lords' descendants in 1931 might have been priced lower than its market value for political reasons, as discussed in the data section. After WWII, lords were deprived of their political privilege; they might have sold their land, and their land might have been highly valued. To address these concerns, we control for the descendants' estates or their other land and military infrastructure in the regression analysis. However, the results are robust against controlling for these factors.[39]

5 Policy Implication

Policymakers recognize that lot fragmentation is an important obstacle in urban development (Nelson and Lang, 2007), but the long-run effects of lot fragmentation are not well understood. This is particularly relevant to today's growing cities in developing countries (Bryan et al., 2019), which often have poor urban slums in very central areas. The provision of property rights in urban slums to enhance economic development has been discussed and implemented in practice. Various studies analyze whether such entitlements increase investments in housing (Field, 2005; Field and Torero, 2006; Henderson et al., 2016). Our results imply that entitling property rights may have unintended consequences for productivity through lot fragmentation in rapidly growing cities when such areas need to be transformed into business zones with high-rise buildings.[40]

To obtain a more policy-relevant parameter, we estimate the impact of additional lot in the 1872 on the land price of today, using local lords' estates as an instrument. Note that the map in the 1872 only covers the relatively central area, which will result in a bigger effect than the average effect as analyzed in Table 6. We find that additional lot in the 1872 decreases the land price in 2012 by 1.3–3.9%.[41] Because the standard deviation of the number of lots is

[39] See Table A.28, Table A.29, Table A.30, and Table A.31.

[40] Similarly, Harari and Wong (2019) and Michaels et al. (2020) show that upgrading amenities in slums may result in lower land prices and shorter buildings by increasing formalization costs.

[41] See Table A.32 for the results including the results for other main outcome variables.

about 10, this suggests a substantial negative impact of initial lot fragmentation on the land price. Although this parameter will be heterogeneous across cities, it will be a benchmark for policymakers of rapidly growing cities in developing countries.

6 Conclusion

In this study, we investigate whether transaction costs in the urban land market generate lot size persistence and hinder efficient land use. We construct a 100 m*100 m-cell-level dataset spanning 150 years and use a plausibly exogenous release of large lots (local lords' estates) to the private market in 1868. Using OLS and local randomization design, we find that cells used as local lords' estates formerly have larger lots even after 150 years. This lot size persistence is stronger in the central area, implying higher transaction costs there. We also find that previous local lords' estates generate agglomeration benefits in the 2010s: there are more skyscrapers, higher land prices, and productive firms. We also confirm that the effect on firm productivity does not come from the moving, exit, or entry of firms. Meanwhile, before WWII, former local lords' estates had larger lots than other areas but lower land prices. This opposite result on the land price from the 2010s means that previous local lords' estates were too large for optimal land use and discounted due to land split costs. These findings imply that the prediction of the Coase theorem without transaction costs is not relevant in the urban land market, and initial lot sizes have substantial impacts on economic activities even after 150 years. Urban planners in developing countries should take this trade-off into consideration when entitling property rights.

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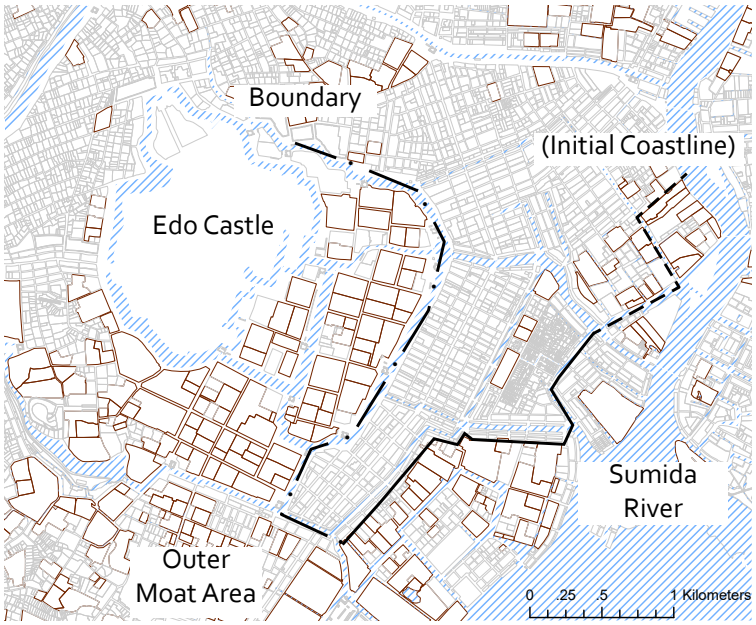
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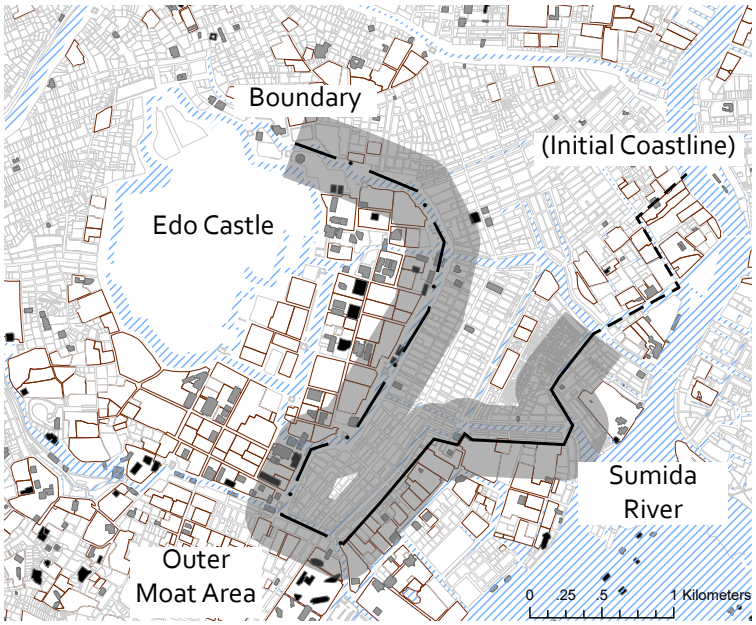
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Figure 1: Zoning in the Initially Developed Area



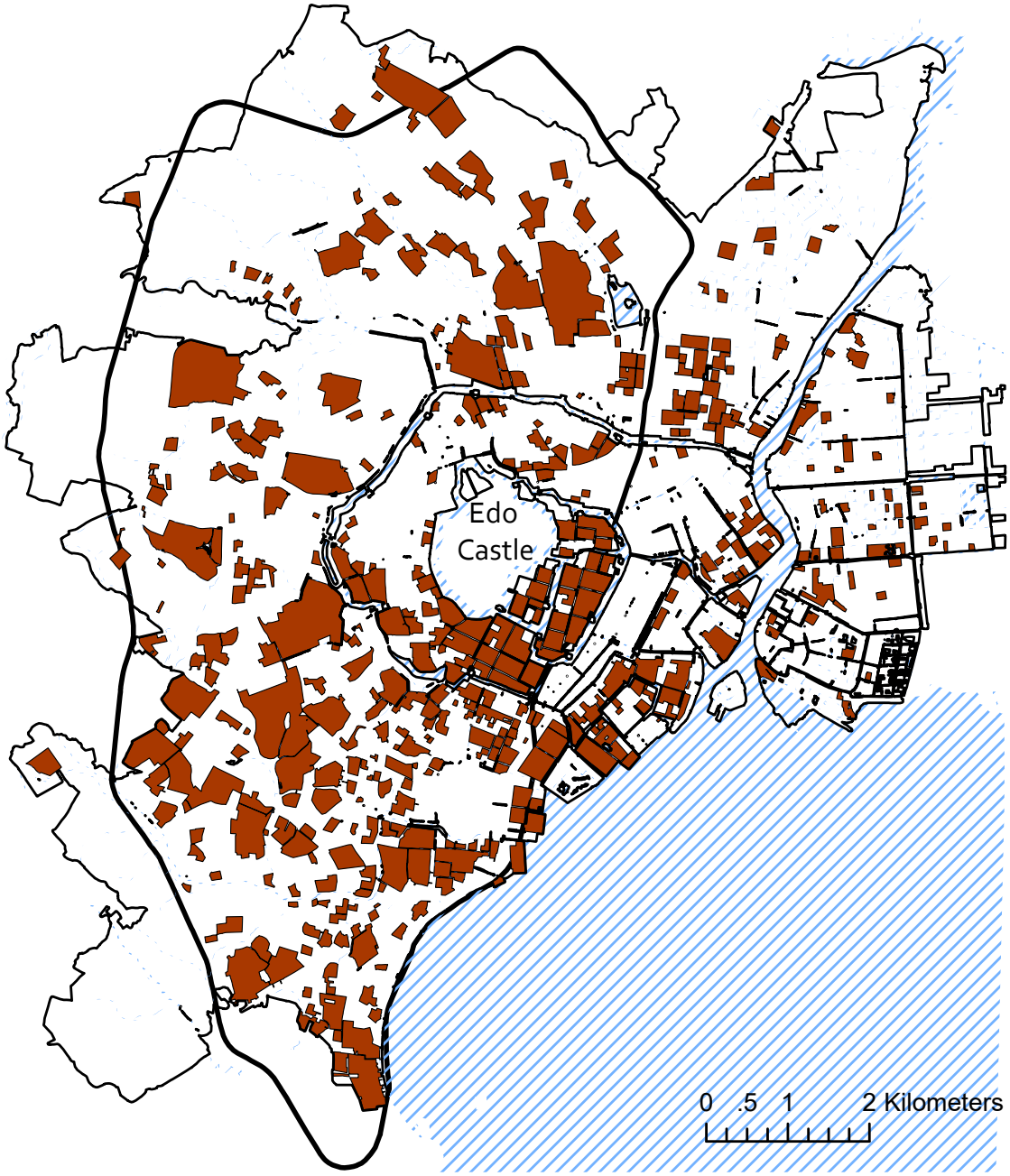
(a)



(b)

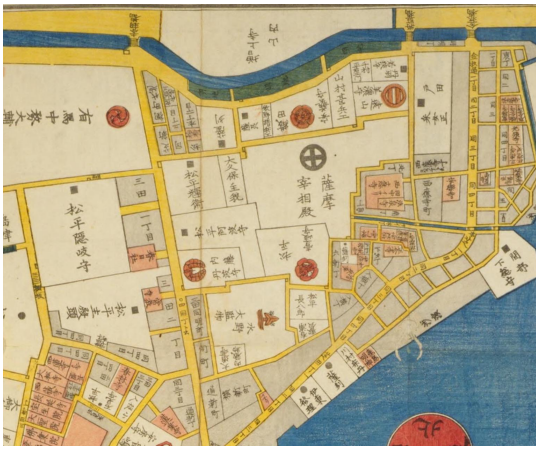
Notes: Polygons with red borders are local lords' estates. The U-shaped line in both figures is the boundary between the local lords' estate zone (the outer side) and the commoners' zone (the inner side). The dash-dot part is the initial boundary between the zones. The solid and dash parts are the initial coastal line. The solid part became part of the boundary after the second reclamation. The gray area in the right figure shows a 250-m buffer, which we use for the local randomization regression analysis. Another line in the right figure from south to north shows the overground railroad loop line (*Yamanote* line). In the right figure, we overlay high-rise buildings in 2011, indicated by black (more than or equal to 30 stories) and gray (15–29 stories) rectangles.

Figure 2: Distribution of Local Lords' Estates

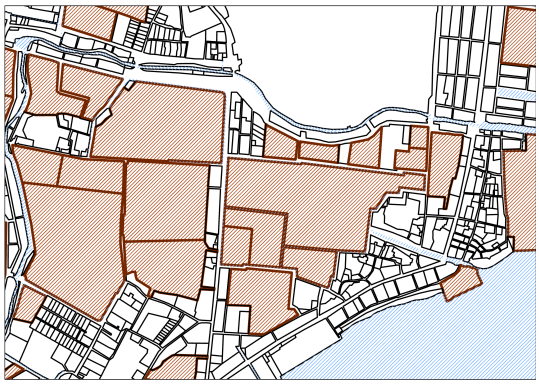


Notes: This map covers the whole of Edo's city area (*Sumibiki sen-nai*). Red areas represent local lords' estates. The gray-shaded area shows the area within the loop (*Yamanote*) line.

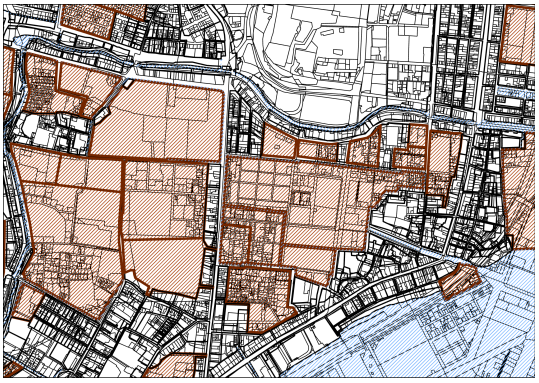
Figure 3: Illustration from a Corner of the Tokyo CBD



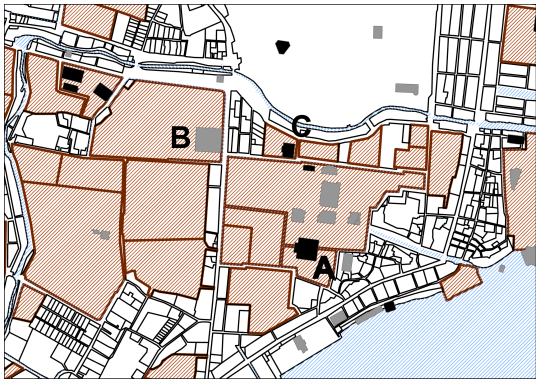
(a) Original Data Source



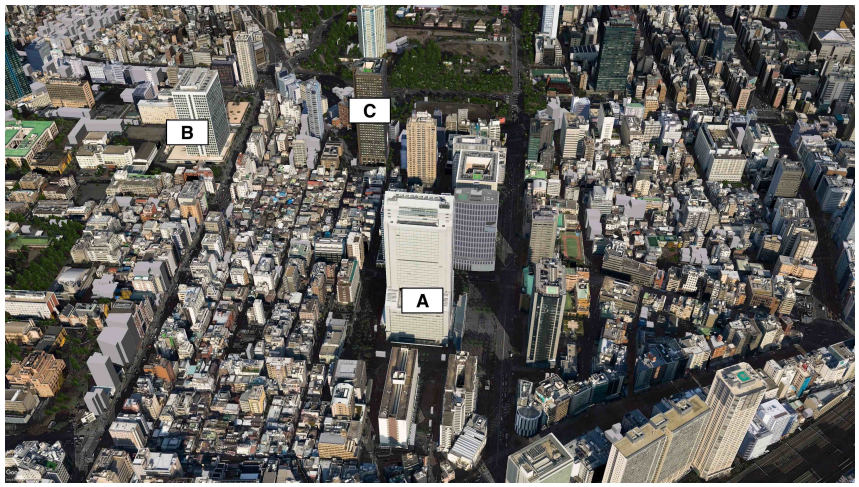
(b) Local Lords' Estates (Red-hatched Area)



(c) (b) + Lot in 2008–2011



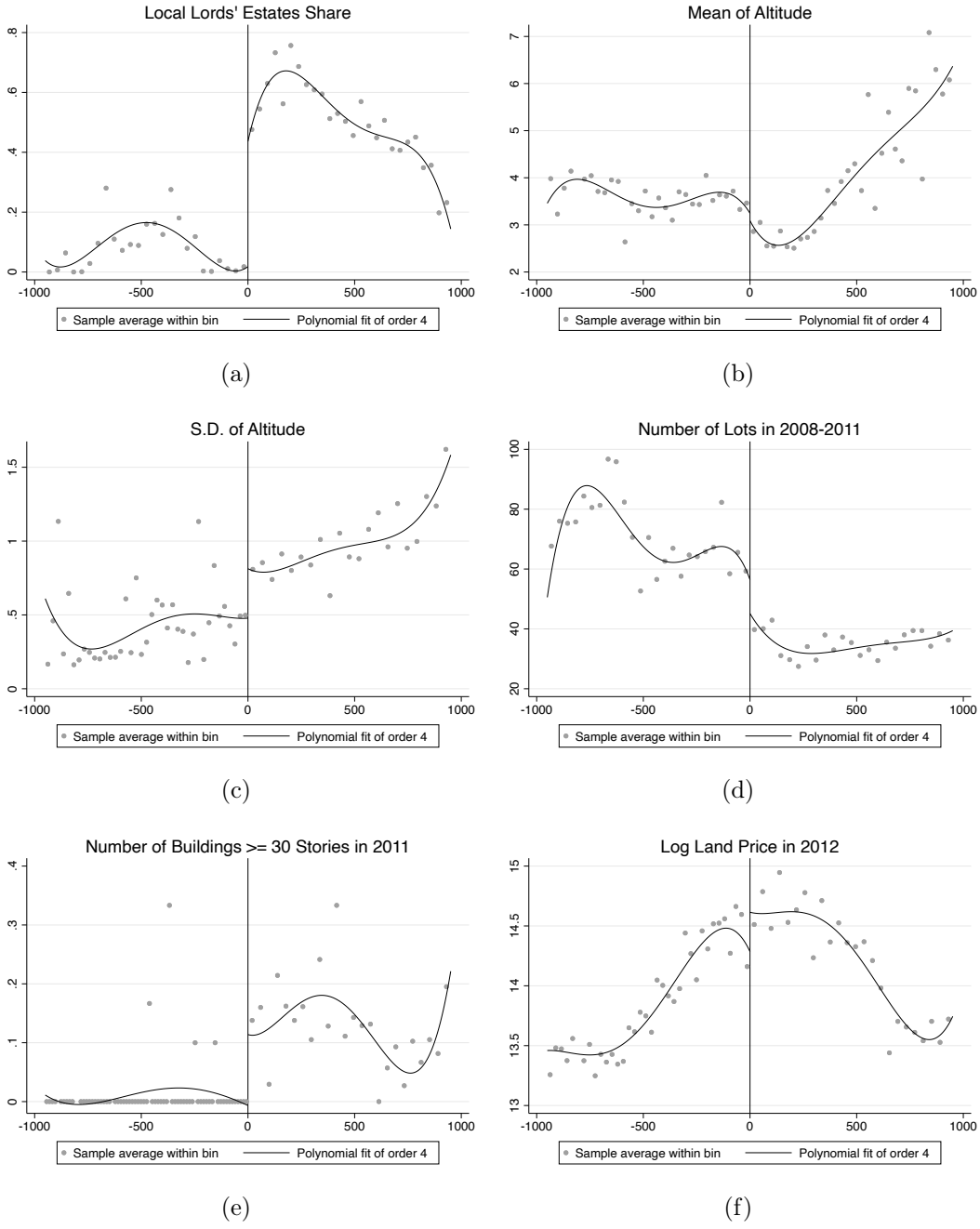
(d) (b) + Tall Buildings: Black (Gray) Buildings Have More Than 30 (15) Stories



(e) Google Earth's Aerial Image Suggesting High Land Assembly Costs: Labels (A, B, and C) correspond to buildings in (d).

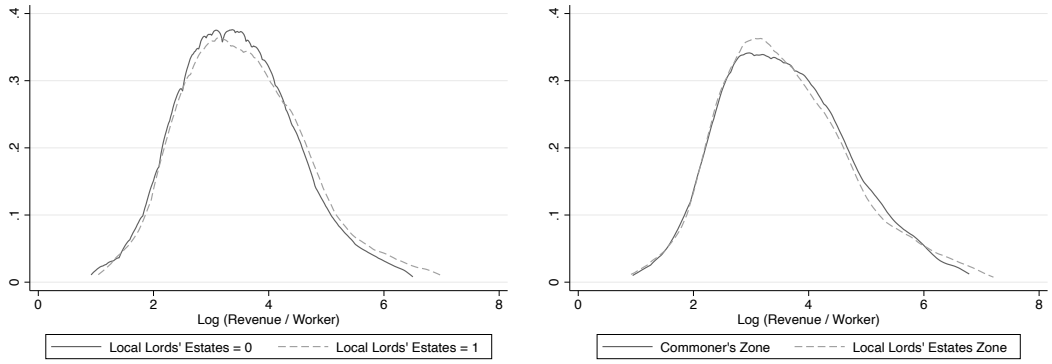
Notes: These figures show the raw data and aerial images around *Tamachi* station, a station in the CBD.

Figure 4: Distribution along the Zoning Boundary



Notes: We use all cells within 1 km of the boundary in Figure 1(b) excluding cells within 50 m of the boundary to avoid mechanical attenuation effects. The x-axis is the distance from the boundary, which is shown as the solid line and dash-dot line in Figure 1(b), taking a positive and negative value in the local lords' estate zone and commoners' zone, respectively. The points show the average of each outcome variable within each bin. The number of bins is chosen using the mimicking variance evenly spaced method using spacing estimators. The lines show the fourth-order polynomial fit for each zone.

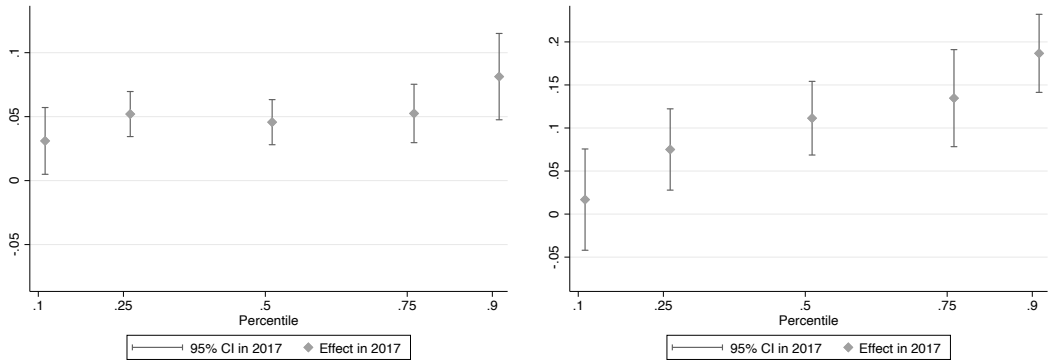
Figure 5: Firm Productivity Distribution in Local Lords' Estate Area and Other Areas



(a) OLS (b) Local Randomization

Notes: Figure 5(a) shows the distribution of firm productivity in 2017 proxied by revenue per worker in cells whose local lords' estates share is zero and one (the solid line and dash line, respectively). Similarly, Figure 5(b) shows the distribution of firm productivity in 2017 proxied by revenue per worker in the local lords' estates zone and the other zone within the sample, respectively, for the local randomization design.

Figure 6: Quantile Regression Results on Firm Productivity

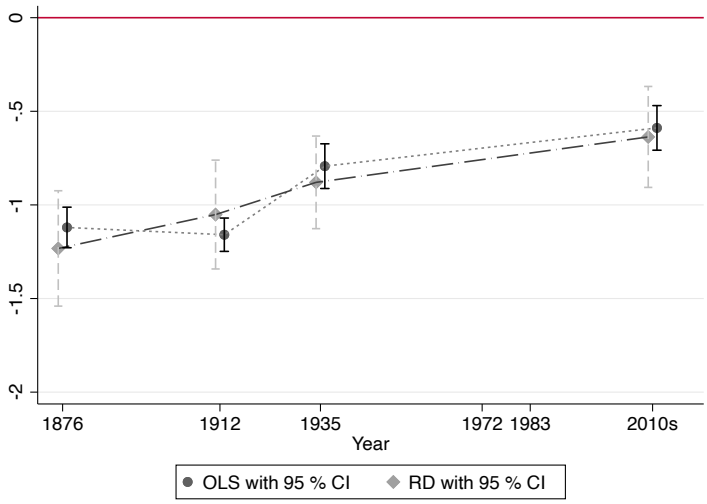


(a) OLS with Controls

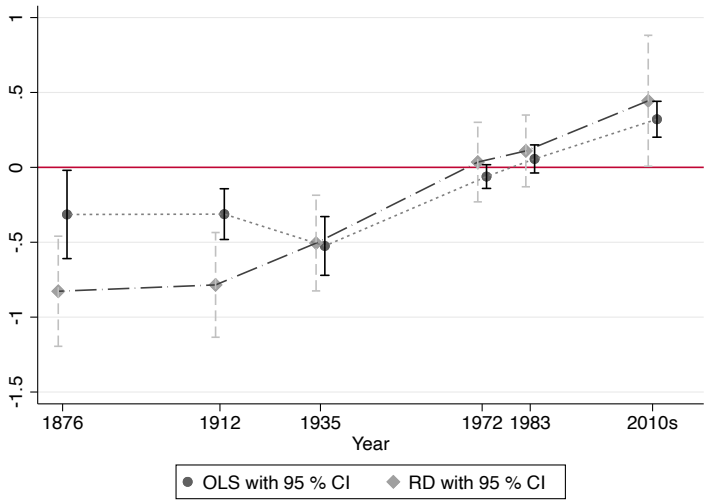
(b) Local Randomization with Controls

Notes: (a) shows the coefficients when regressing log of revenue per worker on local lords' estates share, conditional on *Distance from the Center (Castle)*, *Mean of altitude*, *S.D. of Altitude* and industry fixed effects. Diamonds (Triangles) show the results using the sample in 2017 (1993). (b) shows the coefficients when regressing the log of revenue per worker on the local lords' estates zone variable, conditional on *Distance from the Center (Castle)*, *Mean of altitude*, *S.D. of Altitude*, *West of the Yamanote line*, *Earthquake Risk*, and industry fixed effects. See Panel B in Table A.14 and Table A.15 for the corresponding regression tables.

Figure 7: Time-Varying Effects of Local Lords' Estates



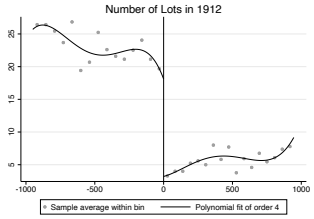
(a) The Effect of Local Lords' Estates on the Number of Lots



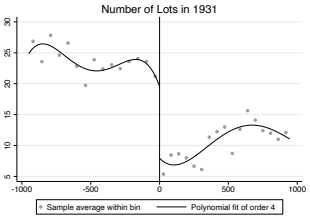
(b) The Effect of Local Lords' Estates on Land Prices

Notes: The circles show the point estimates using OLS with controlling for *Distance from the Center (Castle)*, *Mean of altitude*, and *S.D. of Altitude*. The diamonds show the point estimates using local randomization while controlling for *Distance from the (Castle)* and *West of the Yamanote line*. Figure 7(a) shows the effect of local lords' estates on the number of lots after normalization, and Figure 7(b) shows the effect of local lords' estates on the log of land price.

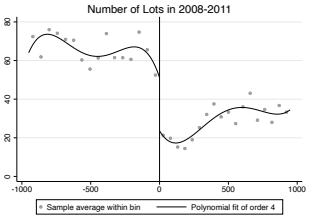
Figure 8: Number of Lots and Land Prices along Zoning Boundary in the Central Area from 1912 to the 2010s



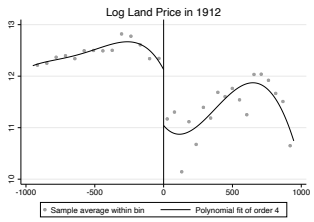
(a) Number of Lots in 1912



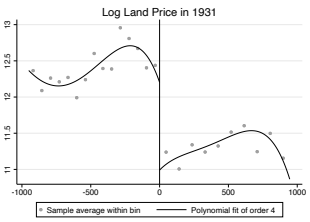
(b) Number of Lots in 1931



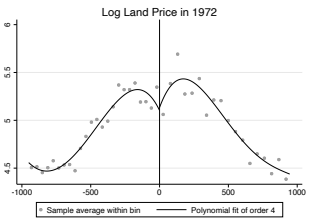
(c) Number of Lots in the 2010s



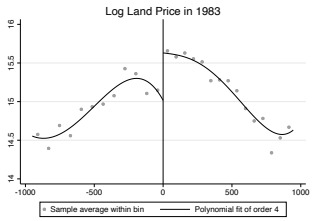
(d) Log Land Price in 1912



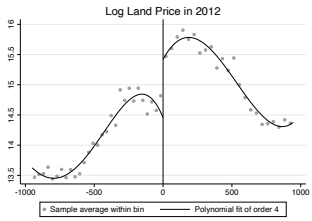
(e) Log Land Price in 1931



(f) Log Land Price in 1972



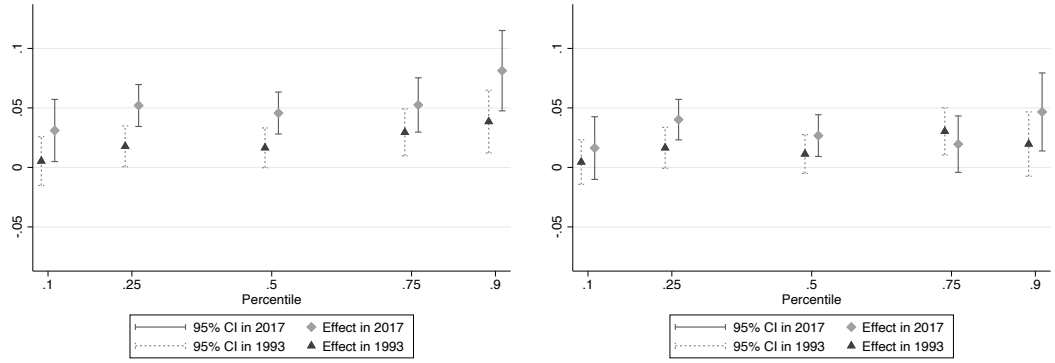
(g) Log Land Price in 1983



(h) Log Land Price in the 2010s

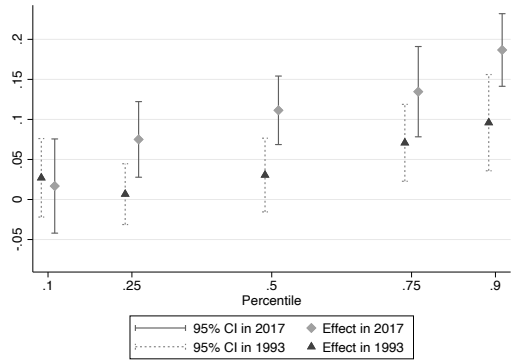
Notes: We use all cells within 1 km of the boundary in Figure 1 excluding cells within 50 m of the boundary to avoid mechanical attenuation effects. The x-axis is the distance from the boundary, which is represented by the dash-dot line in Figure 1, taking a positive and negative value in the local lords' estate zone and commoners' zone, respectively. The points show the average of each outcome variable within each bin. The number of bins is chosen using the mimicking variance evenly spaced method using spacing estimators. The lines show the fourth-order polynomial fit for each zone.

Figure 9: Tall Buildings and Firm Productivity

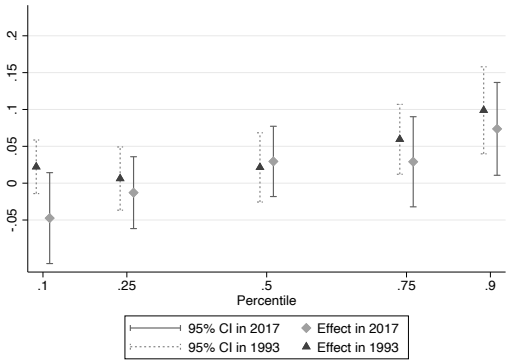


(a) OLS with Controls

(b) (a) + Controlling for Stories



(c) Local Randomization with Controls



(d) (c) + Controlling for Stories

Notes: (a) shows the coefficients when regressing the log of revenue per worker on local lords' estates share, conditional on *Distance from the Center (Castle)*, *Mean of altitude*, *S.D. of Altitude*, and industry fixed effects. Diamonds (triangles) show the results using the sample in 2017 (1993). (b) shows the results when we add the mean of stories (aboveground) as an additional control variable. (c) shows the coefficients when regressing the log of revenue per worker on the local lords' estates zone variable, conditional on *Distance from the Center (Castle)*, *Mean of altitude*, *S.D. of Altitude*, *West of the Yamanote line*, *Earthquake Risk*, and industry fixed effects. (d) shows the results when we add the mean of stories (aboveground) as an additional control variable.

Table 1: Definition of Variables and Their Data Sources

Variable	Definition	Data Source
Main variables		
Local Lords' Estates	The share of areas owned by local lords in the 1850s.	Kageyama et al., eds (1849-1862), ABP Company, ed (2009)
Number of Lots	The number of lots located (at least a part of the lot) in a cell.	Nishikawa and Nishikawa (1880), Ichihara, ed (1876), Tokyo Shiku Chosakai (1912), Seizusha, ed (1931-1935), TDi and Inc (2017)
Number of Buildings	The number of buildings located (at least a part of the building) in a cell.	Tokyo Metropolitan Government (2011)
Stories	Average number of buildings' stories in a cell. *(aboveground)* counts only the stories aboveground, whereas *(including underground)* includes the stories underground.	Tokyo Metropolitan Government (2011)
Log Land Price in 2012	We take the average of the road-level price factor by weighting the length of each road.	Research Center for Property Assessment System (2012)
Log Land Price in 1876, 1912, and 1931	We take the area-weighted average of the lot land price.	Nakai, ed (1880), Tokyo Shiku Chosakai (1912), Seizusha, ed (1931-1935)
Log Land Price in 1972 and 1983	We take the average of land prices.	Tokyo-to Takuchi Tatemono Tohirikigyo Kyokai (1972) and Tokyo-to Takuchi Tatemono Tohirikigyo Kyokai (1983)
Other variables		
Average Road Width	Length-weighted average width of roads in a cell.	Shobumsha (2018)
Land Use for Hospitals or Universities, or Parks	The share of areas used for these	Tokyo Metropolitan Government (2011).
Distance to Station in (Year)	Distance in meters to the nearest station in each year.	Ministry of Land, Infrastructure, Transport and Tourism (2014)
FAR Regulations	Average maximum floor-area ratio.	Tokyo Metropolitan Government (2011) and Shobumsha (2018)
Block Area	Average area of blocks (areas surrounded by roads).	Tokyo Metropolitan Government (2011)
WWII Destruction	Proportion of area destroyed during WWII air raids on Tokyo.	Ueno (1945)
Remaining Estates in 1931	Proportion of area owned by the descendants of local lords and used as their estate.	Kazoku Kaikan (1931)
Other Lords' Land / Military in 1931	Proportion of area owned by the descendants of local lords not as their estate/used as military infrastructure.	Seizusha, ed (1931-1935)
Lon and Lat controls	This includes latitude, longitude, their squared terms, and their interaction term.	Centroid of each cell

Table 2: Descriptive Statistics

	Observation	Mean	SD	Min	Max
Panel A: Cell-level Variables					
Local Lords' Estates	9761	0.219	0.364	0	1
Number of Lots in 1872	5488	12.36	10.28	1	111
Number of Lots in 1931	7830	17.21	11.65	1	129
Number of Lots in 1912	8133	14.38	10.11	1	86
Number of Lots for 2008–2011	9101	55.99	36.57	1	202
Land Price in 1912 (1M JPY)	7122	0.0638	0.0819	7.49e-08	0.805
Land Price in 1931 (1M JPY)	4711	0.0616	0.0813	0.000000556	0.781
Land Rental Price in 1931 (1M JPY)	7024	0.0720	0.0680	0.00000131	0.664
Land Price in 2012 (1M JPY)	8971	0.908	1.517	0.0980	16.66
Stories (aboveground) in 2011	9542	5.764	4.687	0	56
Number of Buildings in 2011	9542	35.17	25.22	1	136
Number of Buildings >= 30 Stories in 2011	9542	0.0380	0.214	0	3
Panel B: Firm-level Variables					
Log Revenue per Worker in 2017	80473	3.363	1.167	-3.466	12.48
Log Revenue per Worker in 1993	85313	3.579	1.085	-3.020	12.04

Table 3: Main Results

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1872 (N: 5488)				
Local Lords' Estates Share	-11.60***	-11.39***	-11.46***	-11.50***
	(0.674)	(0.651)	(0.685)	(0.685)
Panel B: Number of Lots in 2008-2011 (N: 9101)				
Local Lords' Estates Share	-23.29***	-21.53***	-19.41***	-19.49***
	(2.686)	(2.648)	(2.692)	(2.695)
Panel C: Number of Buildings in 2011 (N: 9542)				
Local Lords' Estates Share	-13.06***	-11.61***	-10.39***	-10.36***
	(1.675)	(1.654)	(1.651)	(1.652)
Panel D: Stories (aboveground) in 2011 (N: 9542)				
Local Lords' Estates Share	0.802**	0.884**	0.913***	0.845***
	(0.352)	(0.353)	(0.319)	(0.305)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 9542)				
Local Lords' Estates Share	0.0394***	0.0385**	0.0382***	0.0360***
	(0.0147)	(0.0150)	(0.0146)	(0.0139)
Panel F: Log Land Price in 2012 (N: 8971)				
Local Lords' Estates Share	0.338***	0.321***	0.218***	0.200***
	(0.0696)	(0.0728)	(0.0607)	(0.0567)
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	No	Yes	Yes	Yes
S.D. of Altitude	No	Yes	Yes	Yes
Lon and Lat Controls	No	No	Yes	Yes
Earthquake Risk	No	No	No	Yes

Standard errors are shown in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table 4: Local Randomization Design

	(1)	(2)	(3)
Panel I: Local Lords' Estates Share (N: 351)			
Local Lords' Estates Zone	0.542***	0.512***	0.443***
	(0.0803)	(0.0808)	(0.0868)
Panel A: Number of Lots in 1872 (N: 350)			
Local Lords' Estates Zone	-12.14***	-11.61***	-10.39***
	(1.896)	(1.808)	(2.080)
Panel B: Number of Lots in 2008-2011 (N: 352)			
Local Lords' Estates Zone	-23.74***	-23.32***	-21.16***
	(7.128)	(5.965)	(6.481)
Panel C: Number of Buildings in 2011 (N: 351)			
Local Lords' Estates Zone	-10.06**	-10.73***	-10.04***
	(4.446)	(4.087)	(3.834)
Panel D: Stories (aboveground) in 2011 (N: 351)			
Local Lords' Estates Zone	2.159***	2.820***	2.578***
	(0.746)	(0.751)	(0.872)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 351)			
Local Lords' Estates Zone	0.114**	0.127**	0.129**
	(0.0452)	(0.0578)	(0.0538)
Panel F: Log Land Price in 2012 (N: 341)			
Local Lords' Estates Zone	0.179	0.445*	0.350
	(0.333)	(0.265)	(0.218)
Distance from the Center (Castle)	No	Yes	Yes
West of the Yamanote line	No	Yes	Yes
Mean of Altitude	No	No	Yes
S.D. of Altitude	No	No	Yes
Earthquake Risk	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.
Local Lords' Estates Zone takes a value of one if the central point of the cell is in the local lords' estate zone, the outer side of the U-shaped boundary in Figure 1.

Table 5: Selection Channel

	(1)	(2)	(3)
Panel A: Sorting of Movers			
	Δ Local Lords' Estates		
Log Revenue per Worker in 1993	0.000819	0.00102	
	(0.00209)	(0.00246)	
Industry FEs	No	Yes	
Observation (Firm)	25542	25542	
Panel B: Entrant (Outcome: Entrant Dummy)			
	Sample: Full in 2017		
Local Lords' Estates	0.0116	0.00484	
	(0.0135)	(0.0131)	
Log Revenue per Worker in 2017	-0.0576***	-0.0244***	-0.0243***
	(0.00360)	(0.00357)	(0.00361)
Local Lords' Estates * Log Revenue per Worker in 2017	0.00619	0.00467	0.00345
	(0.00388)	(0.00376)	(0.00417)
Geographical Controls (* Log Revenue per Worker in 2017)	Yes	Yes	Yes
Industry FEs	No	Yes	Yes
Local Lords' Estates * Industry FEs	No	No	Yes
Observation (Firm)	80473	80473	80473
Panel C: Exiter (Outcome: Exiter Dummy)			
	Sample: Full in 1993		
Local Lords' Estates	0.00486	0.000869	
	(0.0159)	(0.0158)	
Log Revenue per Worker in 1993	-0.0103***	-0.0156***	-0.0151***
	(0.00386)	(0.00392)	(0.00396)
Local Lords' Estates * Log Revenue per Worker in 1993	0.00140	0.00265	0.000511
	(0.00423)	(0.00421)	(0.00476)
Geographical Controls (* Log Revenue per Worker in 1993)	Yes	Yes	Yes
Industry FEs	No	Yes	Yes
Local Lords' Estates * Industry FEs	No	No	Yes
Observation (Firm)	85310	85310	85310

Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Δ indicates the variable in 2017 minus 1993. Panel A uses firms that change their cells within our sample area. In Panel B (C), the outcome variable is a dummy variable that takes the value one if a firm exists only in 2017 (1993). *Geographical Controls* contain *Distance from the Center (Castle)*, *Mean of Altitude*, and *S.D. of Altitude*.

Table 6: Lot Size Persistence, Central vs Non-Central

	Inside vs Outside the Circle (*Yamanote*) Line					
	300 m		1000 m		2000 m	
	Inside	Outside	Inside	Outside	Inside	Outside
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Number of Lots in 1872						
Local Lords' Estates Share	-11.45***	-10.01***	-11.90***	-8.372***	-11.87***	-6.198***
	(0.780)	(1.153)	(0.740)	(1.262)	(0.714)	(1.315)
Panel B: Number of Lots in 2008-2011						
Local Lords' Estates Share	-23.27***	-6.457	-21.32***	-5.143	-20.40***	0.501
	(2.890)	(5.312)	(2.925)	(4.523)	(2.808)	(5.667)
Panel C: Number of Buildings in 2011						
Local Lords' Estates Share	-11.34***	-3.696	-10.05***	-2.826	-9.680***	2.833
	(1.773)	(3.863)	(1.797)	(3.455)	(1.715)	(4.206)
Panel D: Stories (aboveground) in 2011						
Local Lords' Estates Share	0.871***	0.211	0.749**	0.727	0.710**	0.325
	(0.318)	(0.557)	(0.321)	(0.661)	(0.309)	(0.785)
Panel E: Number of Buildings >= 30 Stories in 2011						
Local Lords' Estates Share	0.0379**	0.00621	0.0375**	0.0155	0.0344**	0.0327
	(0.0154)	(0.0166)	(0.0151)	(0.0217)	(0.0143)	(0.0223)
Panel F: Log Land Price in 2012						
Local Lords' Estates Share	0.247***	-0.141**	0.187***	0.00292	0.181***	-0.0398
	(0.0519)	(0.0716)	(0.0598)	(0.0401)	(0.0598)	(0.0394)
Distance from the Center (Castle)	Yes	Yes	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes	Yes	Yes
Lon and Lat Controls	Yes	Yes	Yes	Yes	Yes	Yes
Earthquake Risk	Yes	Yes	Yes	Yes	Yes	Yes
N in Panel A	3513	1975	4003	1485	4660	828
N in Panel B	6137	2964	7160	1941	7977	1124
N in Panel C	6144	3398	7333	2209	8315	1227
N in Panel D	6144	3398	7333	2209	8315	1227
N in Panel E	6144	3398	7333	2209	8315	1227
N in Panel F	5704	3267	6855	2116	7811	1160

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables.

Column (1) uses cells inside the (*Yamanote*) loop line or cells whose centroid is within 300 m of the loop line. Column (2) uses the other cells. Columns (3) and (4), or (5) and (6) use 1000 m or 2000 m for the threshold, respectively.

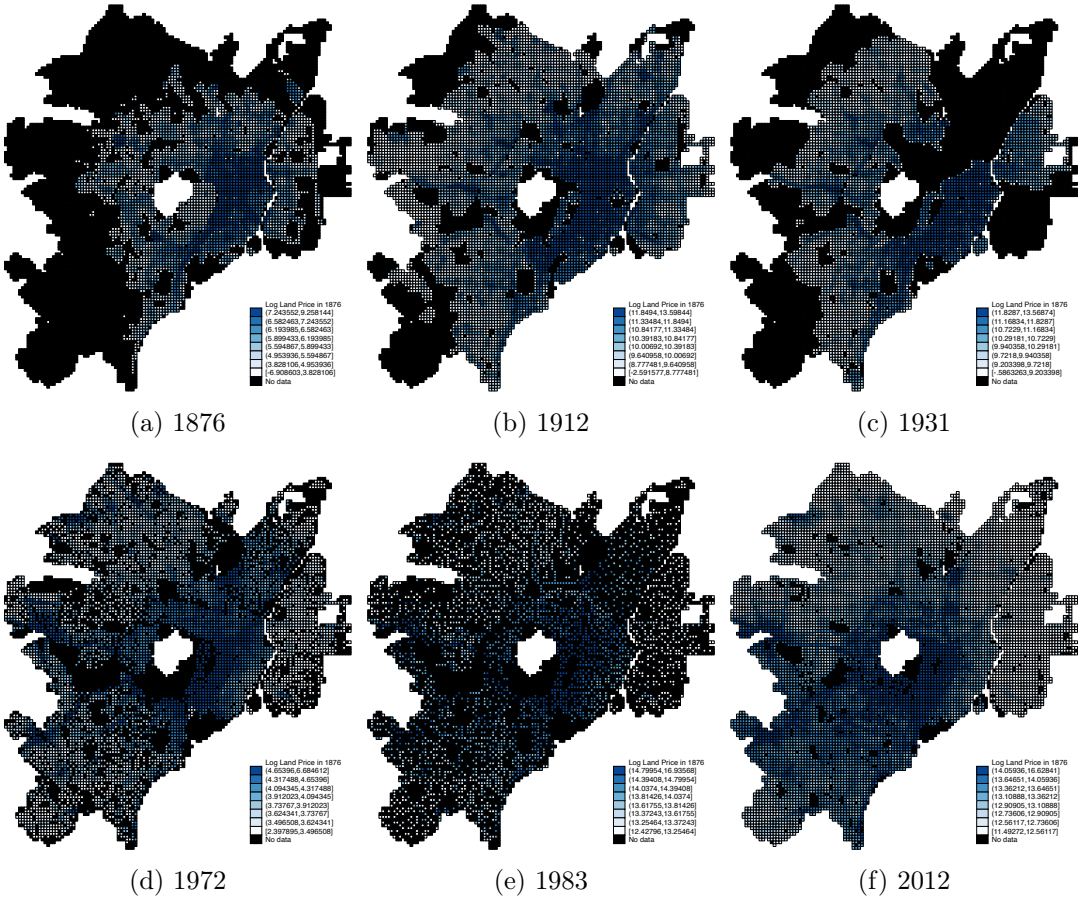
Table 7: Lot Size Persistence, Central vs Non-Central (Local Randomization)

	(1)	(2)	(3)
Panel I: Local Lords' Estates Share (N: 351)			
Local Lords' Estates Zone (Central)	0.574***	0.530***	0.447***
	(0.108)	(0.0843)	(0.0965)
Local Lords' Estates Zone (Non-Central)	0.492***	0.489***	0.439***
	(0.114)	(0.132)	(0.122)
Panel A: Number of Lots in 1872 (N: 350)			
Local Lords' Estates Zone (Central)	-15.55***	-12.70***	-12.42***
	(1.689)	(2.173)	(2.132)
Local Lords' Estates Zone (Non-Central)	-6.890***	-10.23***	-7.992***
	(2.114)	(2.520)	(2.678)
Panel B: Number of Lots in 2008-2011 (N: 352)			
Local Lords' Estates Zone (Central)	-40.98***	-35.82***	-34.02***
	(5.671)	(5.692)	(7.218)
Local Lords' Estates Zone (Non-Central)	3.292	-6.867	-5.561
	(7.120)	(7.461)	(7.535)
Panel C: Number of Buildings in 2011 (N: 351)			
Local Lords' Estates Zone (Central)	-20.90***	-19.12***	-19.52***
	(2.743)	(2.979)	(3.378)
Local Lords' Estates Zone (Non-Central)	6.786	0.338	1.482
	(5.596)	(5.607)	(5.542)
Panel D: Stories (aboveground) in 2011 (N: 351)			
Local Lords' Estates Zone (Central)	3.685***	4.730***	3.937***
	(0.939)	(1.223)	(1.438)
Local Lords' Estates Zone (Non-Central)	-0.214	0.304	0.925
	(0.542)	(0.701)	(0.680)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 351)			
Local Lords' Estates Zone (Central)	0.199***	0.249***	0.225***
	(0.0647)	(0.0845)	(0.0817)
Local Lords' Estates Zone (Non-Central)	-0.0185*	-0.0330	0.0128
	(0.00990)	(0.0403)	(0.0360)
Panel F: Log Land Price in 2012 (N: 341)			
Local Lords' Estates Zone (Central)	0.922***	1.087***	0.878***
	(0.322)	(0.244)	(0.248)
Local Lords' Estates Zone (Non-Central)	-0.874***	-0.360	-0.262
	(0.301)	(0.291)	(0.288)
Distance from the Center (Castle)	No	Yes	Yes
West of the Yamanote line	No	Yes	Yes
Mean of Altitude	No	No	Yes
S.D. of Altitude	No	No	Yes
Earthquake Risk	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.
Local Lords' Estates Zone (Central) (*Local Lords' Estates Zone (Non-Central)*) takes a value of one if the central point of the cell is in the local lords' estate zone, and the closest boundary is the solid (dash-dot) line in Figure 1.

Appendix Not for Publication

Figure A.1: Coverage and Pattern of Land Price Data

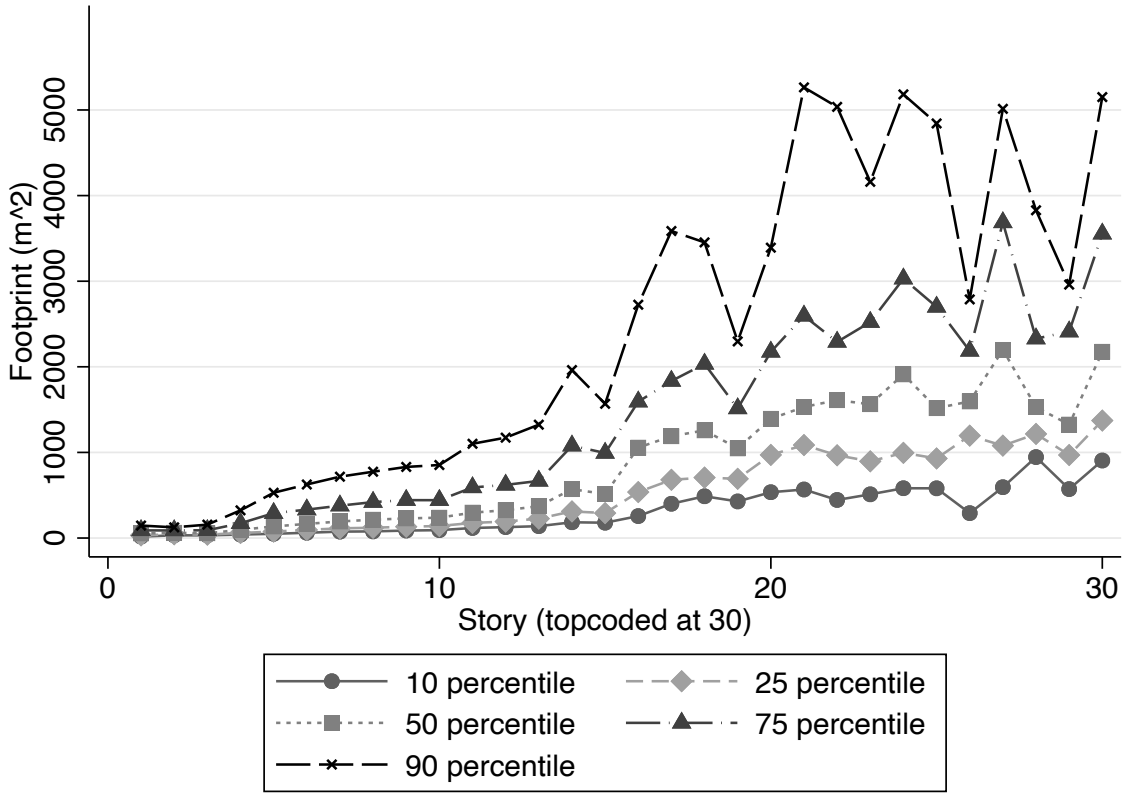


(a) 1876 (b) 1912 (c) 1931

(d) 1972 (e) 1983 (f) 2012

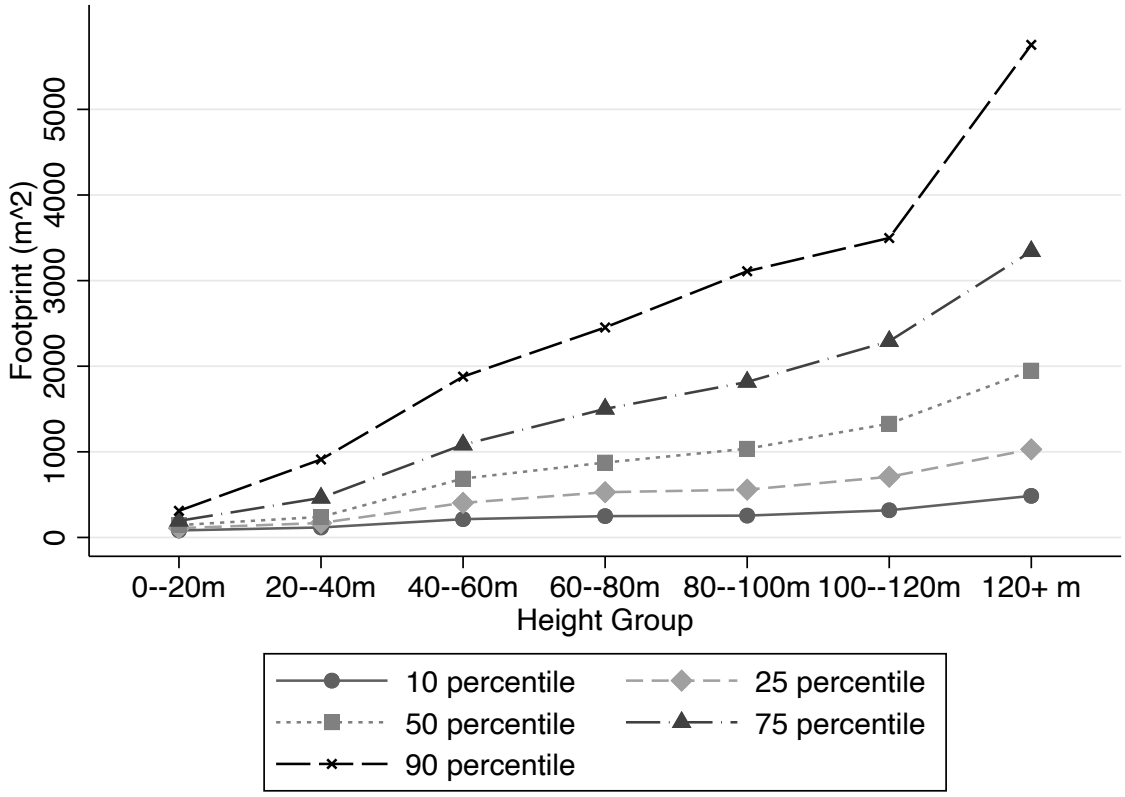
Notes: These maps show the pattern of land price data within our sample defined by the border of old Tokyo city. Black cells indicate missing values.

Figure A.2: Building Heights and Footprint



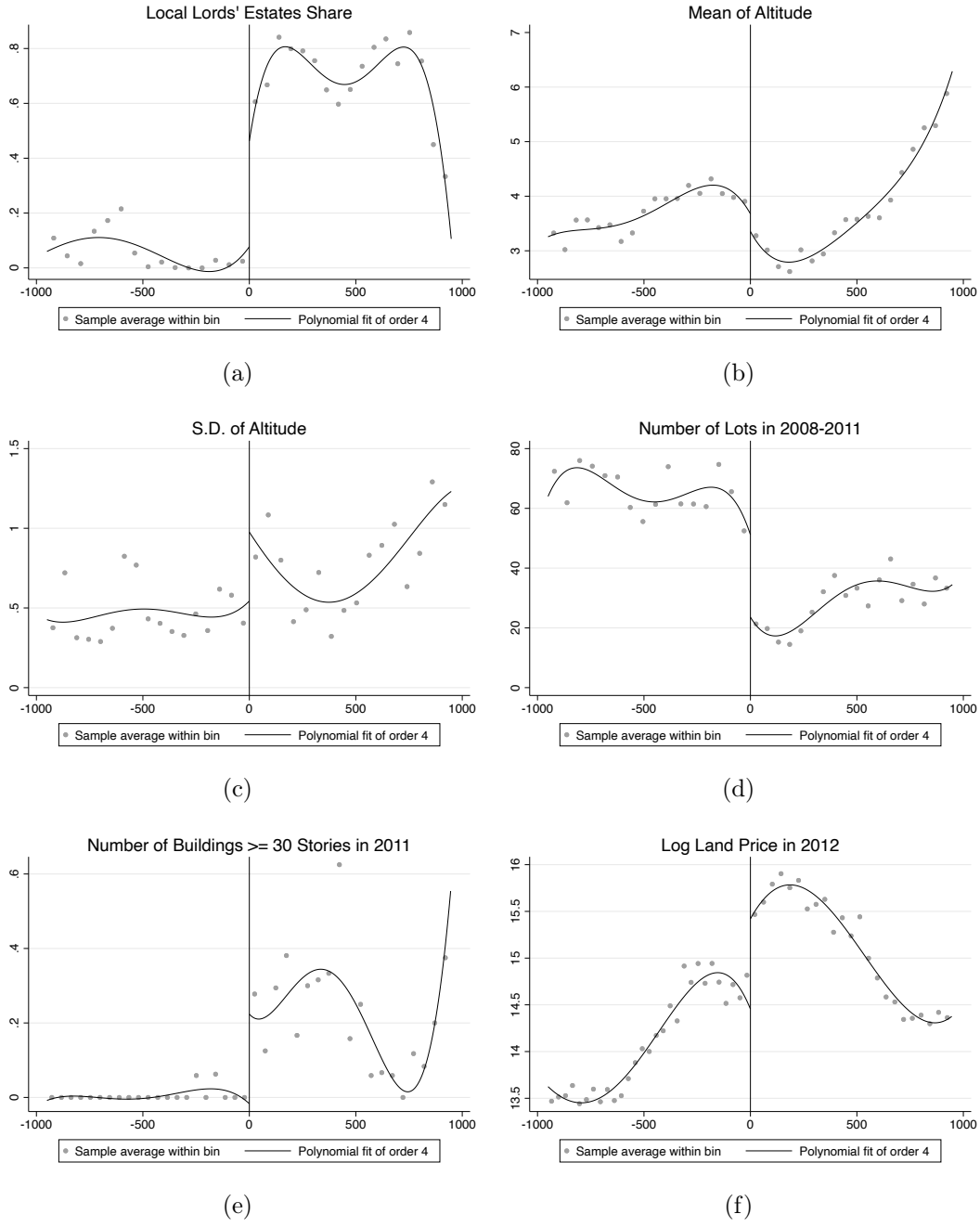
Notes: This graph shows the distribution of footprint of buildings located in Tokyo's 23 wards in 2011 (Tokyo Metropolitan Government, 2011). We show percentiles of footprint conditional on the number of stories.

Figure A.3: Building Heights and Footprint in New York



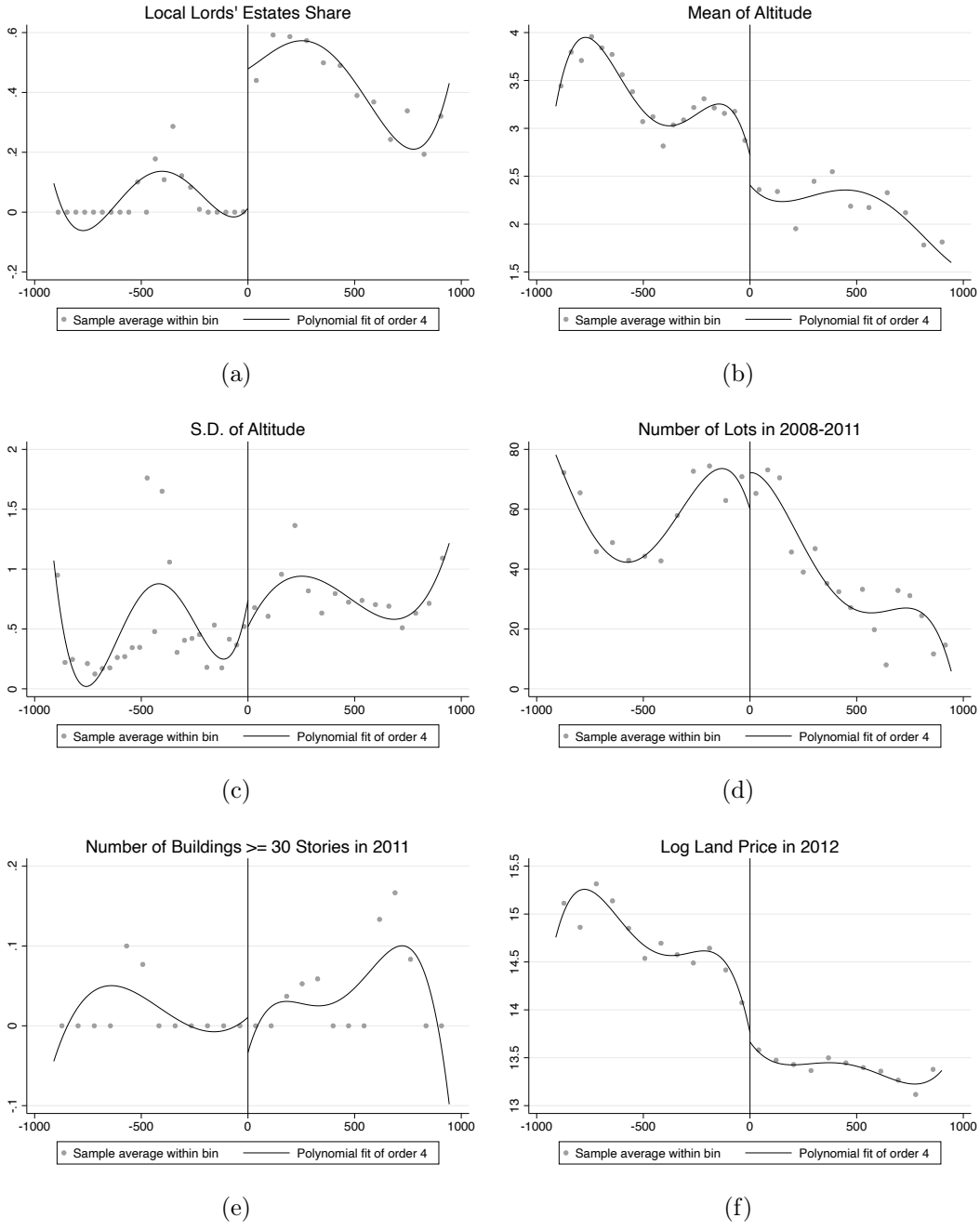
Notes: This graph shows the distribution of footprint of buildings located in New York City (Syracuse and Manhattan) in 2017 (Microsoft, 2017). We show percentiles of footprint conditional on the height groups.

Figure A.4: Distribution along the Zoning Boundary in the Central Area



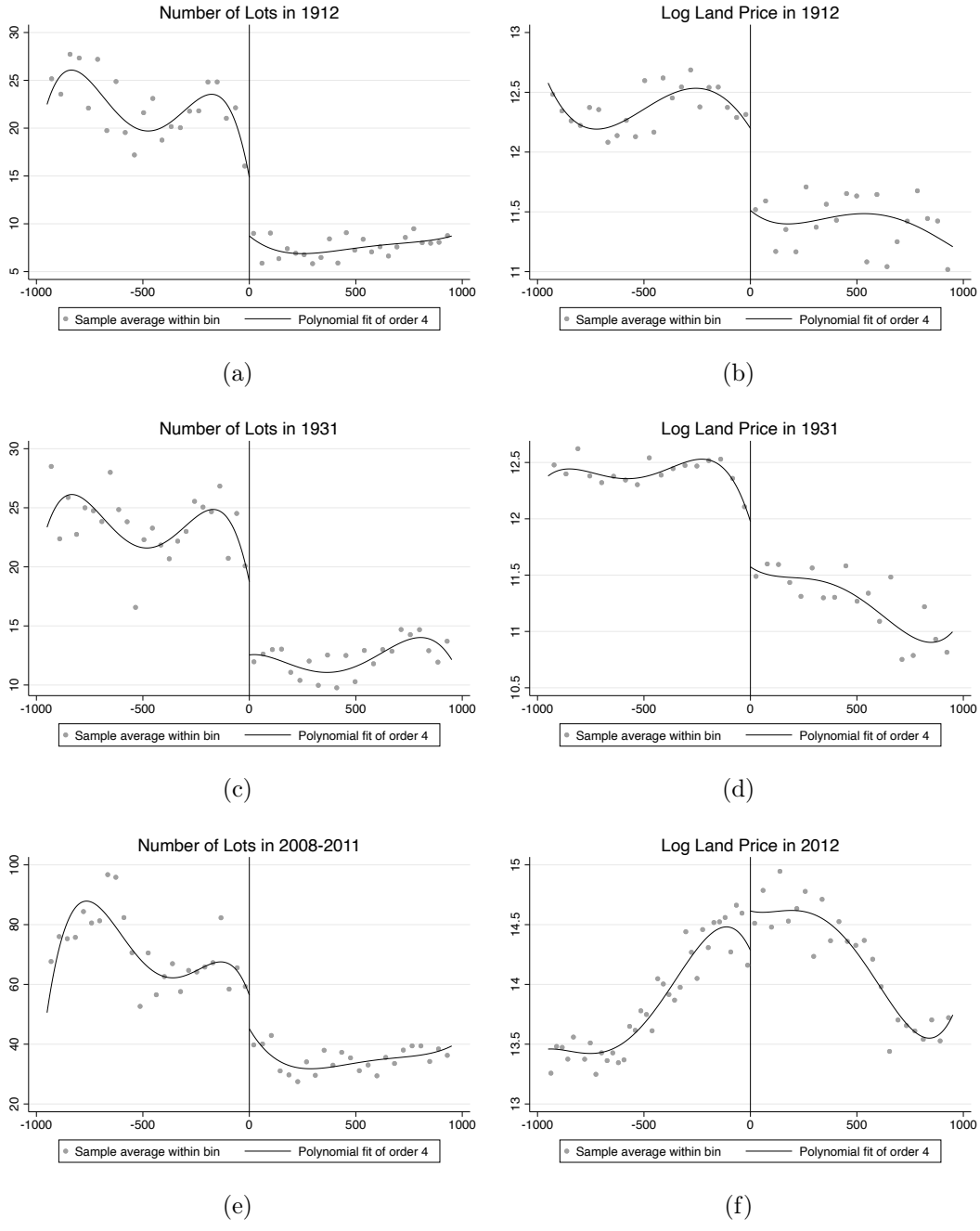
Notes: We use all cells within 1 km of the boundary in Figure 1 excluding cells within 50 m of the boundary to avoid mechanical attenuation effects. The x-axis is the distance from the boundary, which is represented by the dash-dot line in Figure 1, taking a positive and negative value in the local lords' estate zone and commoners' zone, respectively. The points show the average of each outcome variable within each bin. The number of bins is chosen using the mimicking variance evenly spaced method using spacing estimators. The lines show the fourth-order polynomial fit for each zone.

Figure A.5: Distribution along the Zoning Boundary in the Non-Central Area



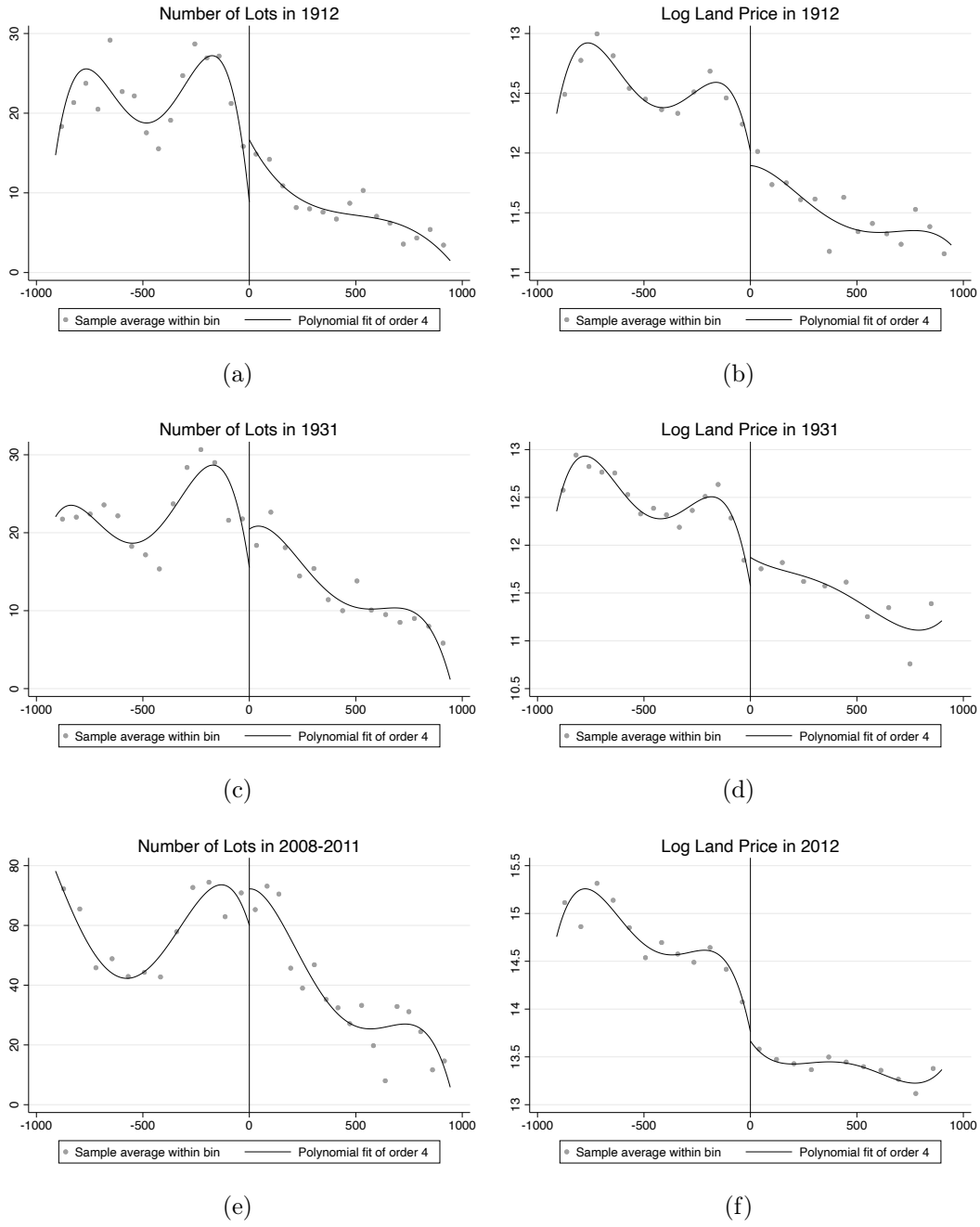
Notes: We use all cells within 1 km of the boundary in Figure 1 excluding cells within 50 m of the boundary to avoid mechanical attenuation effects. The x-axis is the distance from the boundary, which is shown as the solid line in Figure 1, taking a positive and negative value in the local lords' estate zone and commoners' zone, respectively. The points show the average of each outcome variable within each bin. The number of bins is chosen using the mimicking variance evenly spaced method using spacing estimators. The lines show the fourth-order polynomial fit for each zone.

Figure A.6: Number of Lots and Land Prices along Zoning Boundary, from 1912 to the 2010s



Notes: We use all cells within 1 km of the boundary in Figure 1 excluding cells within 50 m of the boundary to avoid mechanical attenuation effects. The x-axis is the distance from the boundary, which is shown as the solid line and dash-dot line in Figure 1, taking a positive and negative value in the local lords' estate zone and commoners' zone, respectively. The points show the average of each outcome variable within each bin. The number of bins is chosen using the mimicking variance evenly spaced method using spacing estimators. The lines show the fourth-order polynomial fit for each zone.

Figure A.7: Number of Lots and Land Prices along Zoning Boundary in the Non-Central Area, from 1912 to the 2010s



Notes: We use all cells within 1 km of the boundary in Figure 1 excluding cells within 50 m of the boundary to avoid mechanical attenuation effects. The x-axis is the distance from the boundary, which is shown as the solid line in Figure 1, taking a positive and negative value in the local lords' estate zone and commoners' zone, respectively. The points show the average of each outcome variable within each bin. The number of bins is chosen using the mimicking variance evenly spaced method using spacing estimators. The lines show the fourth-order polynomial fit for each zone.

Table A.1: Quantile Regression for Building Stories in 2011

	(1)	(2)
Panel A: Log Land Price in 2012 (N: 9542)		
Local Lords' Estates Share	-0.311***	-0.371***
	(0.0850)	(0.0853)
Panel B: Log Land Price in 2012 (N: 9542)		
Local Lords' Estates Share	-0.314***	-0.154***
	(0.0642)	(0.0342)
Panel C: Log Land Price in 2012 (N: 9542)		
Local Lords' Estates Share	-0.251**	-0.119
	(0.103)	(0.102)
Panel D: Log Land Price in 2012 (N: 9542)		
Local Lords' Estates Share	0.532***	0.660***
	(0.185)	(0.187)
Panel E: Log Land Price in 2012 (N: 9542)		
Local Lords' Estates Share	4.265***	4.150***
	(0.594)	(0.607)
Distance from the Center (Castle)	Yes	Yes
Mean of Altitude	No	Yes
S.D. of Altitude	No	Yes

Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.2: Spillover Effects

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1872 (N: 5488)				
Local Lords' Estates Share	-11.39***	-7.671***	-7.307***	-7.619***
	(0.651)	(0.819)	(0.664)	(0.644)
Local Lords' Estates (3*3 Cells)		-0.630***	-0.812***	-0.587***
		(0.173)	(0.190)	(0.175)
Local Lords' Estates (5*5 Cells)			0.0416	-0.151*
			(0.0560)	(0.0906)
Local Lords' Estates (7*7 Cells)				0.0866**
				(0.0429)
Panel B: Number of Lots in 2008-2011 (N: 9101)				
Local Lords' Estates Share	-21.53***	-9.930***	-10.16***	-10.91***
	(2.648)	(2.142)	(1.829)	(1.737)
Local Lords' Estates (3*3 Cells)		-1.928***	-1.821***	-1.300**
		(0.548)	(0.686)	(0.603)
Local Lords' Estates (5*5 Cells)			-0.0240	-0.449
			(0.178)	(0.284)
Local Lords' Estates (7*7 Cells)				0.187
				(0.138)
Panel C: Number of Buildings in 2011 (N: 9542)				
Local Lords' Estates Share	-11.61***	-2.639**	-3.391***	-3.627***
	(1.654)	(1.302)	(1.099)	(1.045)
Local Lords' Estates (3*3 Cells)		-1.500***	-1.139***	-0.974***
		(0.341)	(0.432)	(0.369)
Local Lords' Estates (5*5 Cells)			-0.0807	-0.216
			(0.110)	(0.185)
Local Lords' Estates (7*7 Cells)				0.0597
				(0.0906)
Panel D: Stories (aboveground) in 2011 (N: 9542)				
Local Lords' Estates Share	0.884**	0.101	0.222	0.194
	(0.353)	(0.323)	(0.264)	(0.249)
Local Lords' Estates (3*3 Cells)		0.131*	0.0732	0.0926
		(0.0758)	(0.0776)	(0.0792)
Local Lords' Estates (5*5 Cells)			0.0129	-0.00307
			(0.0207)	(0.0367)
Local Lords' Estates (7*7 Cells)				0.00703
				(0.0153)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 9542)				
Local Lords' Estates Share	0.0385**	-0.00176	0.00412	0.00163
	(0.0150)	(0.0167)	(0.0141)	(0.0134)
Local Lords' Estates (3*3 Cells)		0.00673*	0.00391	0.00565
		(0.00363)	(0.00368)	(0.00368)
Local Lords' Estates (5*5 Cells)			0.000632	-0.000799
			(0.000907)	(0.00167)
Local Lords' Estates (7*7 Cells)				0.000629
				(0.000669)
Panel F: Log Land Price in 2012 (N: 8971)				
Local Lords' Estates Share	0.321***	-0.162***	0.0685***	0.0127
	(0.0728)	(0.0311)	(0.0210)	(0.0149)
Local Lords' Estates (3*3 Cells)		0.0830***	-0.0268	0.0128
		(0.0161)	(0.0170)	(0.0119)
Local Lords' Estates (5*5 Cells)			0.0245***	-0.00886
			(0.00430)	(0.00753)
Local Lords' Estates (7*7 Cells)				0.0146***
				(0.00363)
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables.

*Local Lords' Estates (3*3 Cells)* is the sum of *Local Lords' Estates* in $3 * 3 - 1$ cells surrounding each cell. This means that the point estimate is the effect when one of the cells becomes fully local lords' estates, which is comparable with the point estimate of *Local Lords' Estates*. Other treatment variables are defined similarly.

Table A.3: Different Thresholds for Conley Standard Errors

	Allowing Correlation Within					
	300 m		500 m		1000 m	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Number of Lots in 1872 (N: 5488)						
Local Lords' Estates Share	-11.60***	-11.50***	-11.60***	-11.50***	-11.60***	-11.50***
	(0.674)	(0.685)	(0.874)	(0.871)	(1.184)	(1.059)
Panel B: Number of Lots in 2008-2011 (N: 9101)						
Local Lords' Estates Share	-23.29***	-19.49***	-23.29***	-19.49***	-23.29***	-19.49***
	(2.686)	(2.695)	(3.189)	(3.277)	(3.568)	(3.536)
Panel C: Number of Buildings in 2011 (N: 9542)						
Local Lords' Estates Share	-13.06***	-10.36***	-13.06***	-10.36***	-13.06***	-10.36***
	(1.675)	(1.652)	(1.982)	(2.008)	(2.136)	(2.227)
Panel D: Stories (aboveground) in 2011 (N: 9542)						
Local Lords' Estates Share	0.802**	0.845***	0.802**	0.845**	0.802*	0.845***
	(0.352)	(0.305)	(0.407)	(0.334)	(0.432)	(0.316)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 9542)						
Local Lords' Estates Share	0.0394***	0.0360***	0.0394***	0.0360**	0.0394**	0.0360**
	(0.0147)	(0.0139)	(0.0151)	(0.0141)	(0.0162)	(0.0142)
Panel F: Log Land Price in 2012 (N: 8971)						
Local Lords' Estates Share	0.338***	0.200***	0.338***	0.200***	0.338***	0.200**
	(0.0696)	(0.0567)	(0.0908)	(0.0735)	(0.103)	(0.0800)
Distance from the Center (Castle)	Yes	Yes	Yes	Yes	Yes	Yes
Mean of Altitude	No	Yes	No	Yes	No	Yes
S.D. of Altitude	No	Yes	No	Yes	No	Yes
Lon and Lat Controls	No	Yes	No	Yes	No	Yes
Earthquake Risk	No	Yes	No	Yes	No	Yes

Standard errors are in parentheses. We allow a within-300 m , 300 m, or 1000 m correlation in error terms in columns (1)–(2), (3)–(4), or (5)–(6), respectively. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.4: Alternative Specification of the Treatment Variable: Lot Size of Local Lords' Estates

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1872 (N: 5488)				
Local Lords' Estates Lot Area (Max)	-1286.1***	-1281.8***	-1309.9***	-1310.5***
	(75.11)	(72.62)	(76.82)	(76.73)
Panel B: Number of Lots in 2008-2011 (N: 9101)				
Local Lords' Estates Lot Area (Max)	-2487.4***	-2274.4***	-2131.9***	-2136.0***
	(312.8)	(310.3)	(320.5)	(320.3)
Panel C: Number of Buildings in 2011 (N: 9542)				
Local Lords' Estates Lot Area (Max)	-1342.7***	-1134.3***	-1093.2***	-1089.9***
	(196.4)	(196.7)	(198.6)	(198.7)
Panel D: Stories (aboveground) in 2011 (N: 9542)				
Local Lords' Estates Lot Area (Max)	40.72	56.85	77.45**	72.90*
	(40.91)	(42.47)	(38.83)	(37.31)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 9542)				
Local Lords' Estates Lot Area (Max)	3.620**	3.566**	3.898**	3.749**
	(1.688)	(1.775)	(1.722)	(1.658)
Panel F: Log Land Price in 2012 (N: 8971)				
Local Lords' Estates Lot Area (Max)	27.83***	23.25***	16.61***	15.27**
	(7.278)	(7.647)	(6.399)	(6.013)
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	No	Yes	Yes	Yes
S.D. of Altitude	No	Yes	Yes	Yes
Lon and Lat Controls	No	No	Yes	Yes
Earthquake Risk	No	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables. *Local Lords' Estates Lot Area (Max)* is the max of lot area (km^2) of local lords' estates in each cell. This takes zero if a cell has no local lords' estates.

Table A.5: Coefficient Stability in Main Results

	(1)	(2)	(3)
Panel A: Number of Lots in 1872			
Local Lords' Estates	-11.68***	-11.47***	-11.53***
	(0.683)	(0.659)	(0.694)
Bias-Adjusted Beta	-13.46	-9.898	-11.26
Panel B: Number of Lots in 2008–2011			
Local Lords' Estates	-23.29***	-21.53***	-19.49***
	(2.686)	(2.648)	(2.695)
Bias-Adjusted Beta	-18.14	-17.92	-15.96
Panel C: Number of Buildings in 2011			
Local Lords' Estates	-13.06***	-11.61***	-10.36***
	(1.675)	(1.654)	(1.652)
Bias-Adjusted Beta	-10.24	-8.897	-7.381
Panel D: Stories (aboveground) in 2011			
Local Lords' Estates	0.802**	0.884**	0.845***
	(0.352)	(0.353)	(0.305)
Bias-Adjusted Beta	0.493	0.605	0.547
Panel E: Number of Buildings >= 30 Stories in 2011			
Local Lords' Estates	0.0394***	0.0385**	0.0360***
	(0.0147)	(0.0150)	(0.0139)
Bias-Adjusted Beta	0.0308	0.0305	0.0300
Panel F: Log Land Price in 2012			
Local Lords' Estates	0.338***	0.321***	0.200***
	(0.0696)	(0.0728)	(0.0567)
Bias-Adjusted Beta	0.229	0.208	0.0424
Distance from the Center (Castle)	Yes	Yes	Yes
Mean of Altitude	No	Yes	Yes
S.D. of Altitude	No	Yes	Yes
Lon and Lat Controls	No	No	Yes
Earthquake Risk	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.
The first row shows the coefficients using specifications in columns (2) and (3) of Table 3. The second row shows the bias-adjusted coefficient by considering potential unobserved confounders, as proposed by Oster (2019). As suggested in this study, we set $\delta = 1$ and $R^2_{max} = 1.3\tilde{R}^2$, where $\tilde{R}^2$ is R^2 in the regression models in each column as plausible parameters. In case there are multiple solutions for the bias-adjusted beta, we show the one closest to the original beta.

Table A.6: Regression Discontinuity Design with Polynomials

	(1)	(2)	(3)
Panel I: Local Lords' Estates Share (N: 1269)			
Local Lords' Estates Zone	0.507***	0.541***	0.585***
	(0.117)	(0.105)	(0.0841)
Panel A: Number of Lots in 1872 (N: 1350)			
Local Lords' Estates Zone	-9.432***	-9.222***	-11.00***
	(2.517)	(2.597)	(2.058)
Panel B: Number of Lots in 2008-2011 (N: 1293)			
Local Lords' Estates Zone	-15.62	-14.55	-19.47***
	(10.16)	(9.436)	(7.281)
Panel C: Number of Buildings in 2011 (N: 1296)			
Local Lords' Estates Zone	-5.651	-4.487	-7.740*
	(6.110)	(5.757)	(4.334)
Panel D: Stories (aboveground) in 2011 (N: 1296)			
Local Lords' Estates Zone	2.159*	1.854*	2.729***
	(1.252)	(0.993)	(0.990)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 1296)			
Local Lords' Estates Zone	0.126*	0.112**	0.127**
	(0.0663)	(0.0556)	(0.0545)
Panel F: Log Land Price in 2012 (N: 1135)			
Local Lords' Estates Zone	0.194	0.0858	0.208
	(0.408)	(0.388)	(0.309)
Distance from the Boundary (1st-3rd)	Yes	Yes	Yes
Distance from the Boundary (4th)	No	Yes	No
Distance from the Center (Castle)	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.
We use cells within 1000 m of the boundary (dash-dot line and solid line in Figure 1).

Table A.7: Coefficient Stability in Main Results (Local Randomization)

	(1)	(2)
Panel I: Local Lords' Estates Share		
Local Lords' Estates Zone	0.512***	0.443***
	(0.0808)	(0.0868)
Bias-Adjusted Beta	0.749	0.798
Panel A: Number of Lots in 1872		
Local Lords' Estates Zone	-11.61***	-10.39***
	(1.808)	(2.080)
Bias-Adjusted Beta	-10.79	-7.057
Panel B: Number of Lots in 2008-2011		
Local Lords' Estates Zone	-23.32***	-21.16***
	(5.965)	(6.481)
Bias-Adjusted Beta	-23.07	-19.09
Panel C: Number of Buildings in 2011		
Local Lords' Estates Zone	-10.73***	-10.04***
	(4.087)	(3.834)
Bias-Adjusted Beta	-11.05	-10.03
Panel D: Stories (aboveground) in 2011		
Local Lords' Estates Zone	2.820***	2.578***
	(0.751)	(0.872)
Bias-Adjusted Beta	3.195	2.859
Panel E: Number of Buildings >= 30 Stories in 2011		
Local Lords' Estates Zone	0.127**	0.129**
	(0.0578)	(0.0538)
Bias-Adjusted Beta	0.140	0.140
Panel F: Log Land Price in 2012		
Local Lords' Estates Zone	0.445*	0.350
	(0.265)	(0.218)
Bias-Adjusted Beta	0.539	0.433
Distance from the Center (Castle)	Yes	Yes
West of the Yamanote line	Yes	Yes
Mean of Altitude	No	Yes
S.D. of Altitude	No	Yes
Earthquake Risk	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables.

The first row shows the coefficients using specifications in columns (2)–(3) of Table 4. The second row shows the bias-adjusted coefficient by considering potential unobserved confounders, as proposed by Oster (2019). As suggested in this study, we set $\delta = 1$ and $R^2_{max} = 1.3\tilde{R}^2$, where $\tilde{R}^2$ is R^2 in the regression models in each column, as plausible parameters. In case there are multiple solutions for the bias-adjusted beta, we show the one closest to the original beta.

Table A.8: Selection Channel (Local Randomization)

	(1)	(2)	(3)
Panel A: Sorting of Movers			
	Δ Local Lords' Estates Zone		
Log Revenue per Worker in 1993	0.0105	0.00955	
	(0.00834)	(0.0105)	
Industry FEs	No	Yes	
Observation (Firm)	2436	2436	
Panel B: Entrant (Outcome: Entrant Dummy)			
	Sample: Full in 2017		
Local Lords' Estates Zone	-0.0452*	-0.0464*	-0.00929
	(0.0268)	(0.0265)	(0.0340)
Log Revenue per Worker in 2017	-0.0116	-0.0194	-0.0219
	(0.0356)	(0.0350)	(0.0352)
Local Lords' Estates Zone * Log Revenue per Worker in 2017	0.0128*	0.0137*	0.0130
	(0.00759)	(0.00752)	(0.00813)
Geographical Controls (* Log Revenue per Worker in 2017)	Yes	Yes	Yes
Industry FEs	No	Yes	Yes
Local Lords' Estates * Industry FEs	No	No	Yes
Observation (Firm)	7491	7491	7491
Panel C: Exiter (Outcome: Exiter Dummy)			
	Sample: Full in 1993		
Local Lords' Estates Zone	0.0223	0.0181	-0.376
	(0.0354)	(0.0355)	(0.278)
Log Revenue per Worker in 2017	0.0139	-0.00866	-0.00853
	(0.0421)	(0.0430)	(0.0433)
Local Lords' Estates Zone * Log Revenue per Worker in 1993	-0.00164	-0.00165	-0.00215
	(0.00916)	(0.00924)	(0.0103)
Geographical Controls (* Log Revenue per Worker in 1993)	Yes	Yes	Yes
Industry FEs	No	Yes	Yes
Local Lords' Estates * Industry FEs	No	No	Yes
Stories in 1991 * Industry FEs	No	No	No
Observation (Firm)	8206	8206	8206

Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Δ indicates the variable in 2017 minus 1993. For stories, we use the number of stories aboveground in 2011 and 1991, respectively. Panel A uses firms that change their located cells within our sample area for the local randomization analysis. In Panel B (C), the outcome variable is a dummy variable that takes the value one if a firm exists only in 2017 (1993). *Geographical Controls* contains *Distance from the Center (Castle)*, *West of the Yamanote Line*, *Mean of Altitude* and *S.D. of Altitude*.

Table A.9: Time-Varying Effects of Local Lords' Estates

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1876				
Local Lords' Estates Share	-10.76***	-10.51***	-10.45***	-10.51***
	(0.647)	(0.618)	(0.658)	(0.657)
Panel B: Number of Lots in 1912				
Local Lords' Estates Share	-12.04***	-11.72***	-11.83***	-11.84***
	(0.561)	(0.547)	(0.576)	(0.578)
Panel C: Number of Lots in 1931				
Local Lords' Estates Share	-9.537***	-9.239***	-9.376***	-9.399***
	(0.863)	(0.845)	(0.870)	(0.873)
Panel D: Log Land Price in 1876				
Local Lords' Estates Share	-0.259	-0.315*	-0.372**	-0.398**
	(0.174)	(0.179)	(0.182)	(0.181)
Panel E: Log Land Price in 1912				
Local Lords' Estates Share	-0.421***	-0.312***	-0.499***	-0.507***
	(0.119)	(0.103)	(0.101)	(0.101)
Panel F: Log Land Price in 1931				
Local Lords' Estates Share	-0.633***	-0.525***	-0.698***	-0.722***
	(0.139)	(0.119)	(0.111)	(0.109)
Panel G: Log Land Rental Price in 1931				
Local Lords' Estates Share	-0.439***	-0.319***	-0.393***	-0.406***
	(0.0991)	(0.0856)	(0.0800)	(0.0794)
Panel H: Log Land Price in 1972				
Local Lords' Estates Share	-0.0783	-0.0615	-0.0420	-0.0525
	(0.0494)	(0.0482)	(0.0440)	(0.0417)
Panel I: Log Land Price in 1983				
Local Lords' Estates Share	0.0413	0.0562	0.0142	0.00137
	(0.0575)	(0.0569)	(0.0489)	(0.0451)
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	No	Yes	Yes	Yes
S.D. of Altitude	No	Yes	Yes	Yes
Lon and Lat Controls	No	No	Yes	Yes
Earthquake Risk	No	No	No	Yes
N in Panel A	5316	5316	5316	5316
N in Panel B	8133	8133	8133	8133
N in Panel C	7830	7830	7830	7830
N in Panel D	3644	3644	3644	3644
N in Panel E	7122	7122	7122	7122
N in Panel F	4711	4711	4711	4711
N in Panel G	7024	7024	7024	7024
N in Panel H	6071	6071	6071	6071
N in Panel I	3276	3276	3276	3276

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables.

Log Land Rental Price in 1931 is used to assess *Log Land Price in 1931*, and *Log Land Rental Price in 1931* is available, with greater coverage in Seizusha, ed (1931-1935).

Table A.10: Time-Varying Effects of Local Lords' Estates (Local Randomization)

	(1)	(2)	(3)
Panel I: Local Lords' Estates Share			
Local Lords' Estates Zone	0.542***	0.512***	0.443***
	(0.0803)	(0.0808)	(0.0868)
Panel A: Number of Lots in 1876			
Local Lords' Estates Zone	-12.31***	-11.56***	-10.44***
	(1.912)	(1.752)	(2.075)
Panel B: Number of Lots in 1912			
Local Lords' Estates Zone	-11.27***	-10.63***	-9.525***
	(2.033)	(1.782)	(2.095)
Panel C: Number of Lots in 1931			
Local Lords' Estates Zone	-9.522***	-10.25***	-9.269***
	(2.543)	(1.746)	(2.028)
Panel D: Log Land Price in 1876			
Local Lords' Estates Zone	-0.894***	-0.827***	-0.681***
	(0.236)	(0.223)	(0.234)
Panel E: Log Land Price in 1912			
Local Lords' Estates Zone	-0.838***	-0.785***	-0.627***
	(0.211)	(0.212)	(0.213)
Panel F: Log Land Price in 1931			
Local Lords' Estates Zone	-0.697***	-0.506***	-0.390*
	(0.188)	(0.194)	(0.215)
Panel G: Log Land Rental Price in 1931			
Local Lords' Estates Zone	-0.462***	-0.298**	-0.306*
	(0.151)	(0.145)	(0.170)
Distance from the Center (Castle)	No	Yes	Yes
West of the Yamanote line	No	Yes	Yes
Mean of Altitude	No	No	Yes
S.D. of Altitude	No	No	Yes
Earthquake Risk	No	No	Yes
N in Panel I	351	351	351
N in Panel A	348	348	348
N in Panel B	343	343	343
N in Panel C	347	347	347
N in Panel D	319	319	319
N in Panel E	294	294	294
N in Panel F	268	268	268
N in Panel G	299	299	299

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.
Log Land Rental Price in 1931 is used to assess *Log Land Price in 1931*, and *Log Land Rental Price in 1931* is available, with greater coverage in Seizusha, ed (1931-1935).

Table A.11: The Effect on Buildings in These Recent 25 Years (OLS)

	(1)	(2)	(3)	(4)
Panel A: Number of Buildings in 1986 (N: 9566)				
Local Lords' Estates Share	-14.22***	-12.52***	-11.27***	-11.29***
	(1.729)	(1.669)	(1.695)	(1.688)
Panel B: Number of Buildings in 2001 (N: 9567)				
Local Lords' Estates Share	-13.61***	-12.01***	-11.00***	-10.97***
	(1.731)	(1.697)	(1.716)	(1.712)
Panel C: Number of Buildings in 2011 (N: 9542)				
Local Lords' Estates Share	-13.06***	-11.61***	-10.39***	-10.36***
	(1.675)	(1.654)	(1.651)	(1.652)
Panel D: Stories (including underground) in 1986 (N: 9566)				
Local Lords' Estates Share	0.193	0.203	0.276	0.238
	(0.199)	(0.203)	(0.190)	(0.185)
Panel E: Stories (including underground) in 2001 (N: 9567)				
Local Lords' Estates Share	0.453	0.509*	0.619**	0.574**
	(0.301)	(0.307)	(0.278)	(0.270)
Panel F: Stories (including underground) in 2011 (N: 9542)				
Local Lords' Estates Share	0.914**	0.997**	1.043***	0.964***
	(0.386)	(0.390)	(0.349)	(0.332)
Panel G: Number of Buildings >= 30 Stories (including underground) in 1986 (N: 9329)				
Local Lords' Estates Share	0.0132**	0.0125**	0.0144**	0.0137**
	(0.00604)	(0.00604)	(0.00601)	(0.00571)
Panel H: Number of Buildings >= 30 Stories (including underground) in 2001 (N: 9472)				
Local Lords' Estates Share	0.0291***	0.0280***	0.0300***	0.0297***
	(0.0106)	(0.0107)	(0.0105)	(0.0105)
Panel I: Number of Buildings >= 30 Stories (including underground) in 2011 (N: 9542)				
Local Lords' Estates Share	0.0412**	0.0401**	0.0400**	0.0376**
	(0.0161)	(0.0166)	(0.0159)	(0.0152)
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	No	Yes	Yes	Yes
S.D. of Altitude	No	Yes	Yes	Yes
Lon and Lat Controls	No	No	Yes	Yes
Earthquake Risk	No	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.12: The Effect on Buildings in These Recent 25 Years (Local Randomization)

	(1)	(2)	(3)
Panel I: Number of Buildings in 1986 (N: 351)			
Local Lords' Estates Zone	-8.518*	-8.600**	-8.509**
	(4.919)	(4.322)	(4.061)
Panel A: Number of Buildings in 2001 (N: 352)			
Local Lords' Estates Zone	-11.75***	-11.99***	-11.63***
	(4.531)	(4.122)	(4.006)
Panel B: Number of Buildings in 2011 (N: 351)			
Local Lords' Estates Zone	-10.06**	-10.73***	-10.04***
	(4.446)	(4.087)	(3.834)
Panel C: Stories (including underground) in 1986 (N: 351)			
Local Lords' Estates Zone	0.696	0.863	0.518
	(0.748)	(0.561)	(0.512)
Panel D: Stories (including underground) in 2001 (N: 352)			
Local Lords' Estates Zone	1.535*	1.670**	0.880
	(0.918)	(0.768)	(0.633)
Panel E: Stories (including underground) in 2011 (N: 351)			
Local Lords' Estates Zone	2.605***	3.410***	3.012***
	(0.891)	(0.855)	(0.997)
Panel F: Number of Buildings >= 30 Stories (including underground) in 1986 (N: 348)			
Local Lords' Estates Zone	0.0207	0.00100	-0.0124
	(0.0202)	(0.0110)	(0.00853)
Panel G: Number of Buildings >= 30 Stories (including underground) in 2001 (N: 349)			
Local Lords' Estates Zone	0.0420*	0.0268	0.0109
	(0.0242)	(0.0175)	(0.0153)
Panel H: Number of Buildings >= 30 Stories (including underground) in 2011 (N: 351)			
Local Lords' Estates Zone	0.124**	0.141**	0.141**
	(0.0498)	(0.0640)	(0.0582)
Distance from the Center (Castle)	No	Yes	Yes
West of the Yamanote line	No	Yes	Yes
Mean of Altitude	No	No	Yes
S.D. of Altitude	No	No	Yes
Earthquake Risk	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.13: Business and Residential Zones

	Business Zones		Residential Zones	
	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1872				
Local Lords' Estates Share	-15.01***	-14.26***	-11.73***	-11.77***
	(1.044)	(1.057)	(1.135)	(1.277)
Panel B: Number of Lots in 2008-2011				
Local Lords' Estates Share	-29.88***	-26.30***	-24.50***	-17.98***
	(4.415)	(4.430)	(4.196)	(4.512)
Panel C: Number of Buildings in 2011				
Local Lords' Estates Share	-13.80***	-11.57***	-16.89***	-14.27***
	(2.600)	(2.624)	(2.928)	(2.929)
Panel D: Stories (aboveground) in 2011				
Local Lords' Estates Share	3.747***	3.827***	0.519	0.630
	(0.973)	(0.851)	(0.400)	(0.438)
Panel E: Number of Buildings >= 30 Stories in 2011				
Local Lords' Estates Share	0.148***	0.154***	0.0163	0.00895
	(0.0473)	(0.0437)	(0.0169)	(0.0210)
Panel F: Log Land Price in 2012				
Local Lords' Estates Share	0.252	0.125	0.342***	0.171***
	(0.167)	(0.127)	(0.0496)	(0.0344)
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes
Lon and Lat Controls	No	Yes	No	Yes
Earthquake Risk	No	Yes	No	Yes
N in Panel A	726	726	571	571
N in Panel B	1006	1006	1519	1519
N in Panel C	1018	1018	1738	1738
N in Panel D	1018	1018	1738	1738
N in Panel E	1018	1018	1738	1738
N in Panel F	954	954	1720	1720

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.
Columns (1) and (2) (columns (3) and (4)) use only cells for which more than half the area is used for business (residential) purposes.

Table A.14: Quantile Regressions on Firm Productivity (OLS Sample)

	Log Revenue / Worker				
	Percentiles				
	10	25	50	75	90
	(1)	(2)	(3)	(4)	(5)
Results in 2017					
Panel A: Baseline Results with Geographical Controls					
Local Lords' Estates	0.0365**	0.0298**	0.0216	0.0346*	0.0739***
	(0.0181)	(0.0131)	(0.0149)	(0.0178)	(0.0262)
Panel B: Panel A with Industry Fixed Effects					
Local Lords' Estates	0.0310*	0.0520***	0.0457***	0.0525***	0.0813***
	(0.0159)	(0.0107)	(0.0107)	(0.0139)	(0.0205)
Panel C: Panel B with Controlling for Stories					
Local Lords' Estates	0.0163	0.0402***	0.0267**	0.0196	0.0466**
	(0.0160)	(0.0103)	(0.0106)	(0.0144)	(0.0199)
Results in 1993					
Panel D: Baseline Results with Geographical Controls					
Local Lords' Estates	0.00572	-0.0100	0.00231	0.0283	0.0247
	(0.0164)	(0.0138)	(0.0134)	(0.0153)	(0.0271)
Panel E: Panel D with Industry Fixed Effects					
Local Lords' Estates	0.00532	0.0177	0.0165	0.0294**	0.0385**
	(0.0125)	(0.0104)	(0.0102)	(0.0120)	(0.0160)
Panel F: Panel E with Controlling for Stories					
Local Lords' Estates	0.00451	0.0164	0.0113	0.0303**	0.0196
	(0.0114)	(0.0105)	(0.00991)	(0.0121)	(0.0164)

Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. In Panels A and C, we control for geographical variables used in the main specification, *Distance from the Center (Castle)*, *Mean of Altitude*, and *S.D. of Altitude*. In Panels B and D, we also include two-digit-level industry fixed effects, corresponding to Figure 9(a). We add the mean of stories (aboveground) as an additional control in Panels C and F, corresponding to Figure 9(b). The number of observations (firms) in Panels A–C (Panels D–F) is 80473 (85310).

Table A.15: Quantile Regressions on Firm Productivity (Local Randomization)

	Log Revenue / Worker				
	Percentiles				
	10	25	50	75	90
	(1)	(2)	(3)	(4)	(5)
Results in 2017					
Panel A: Baseline Results with Geographical Controls					
Local Lords' Estates Zone	0.0188	0.0766**	0.0657	0.115**	0.130
	(0.0458)	(0.0336)	(0.0432)	(0.0512)	(0.0804)
Panel B: Panel A with Industry Fixed Effects					
Local Lords' Estates Zone	0.0168	0.0750***	0.111***	0.135***	0.187***
	(0.0358)	(0.0287)	(0.0260)	(0.0343)	(0.0276)
Panel C: Panel B with Controlling for Stories					
Local Lords' Estates Zone	-0.0474	-0.0129	0.0295	0.0290	0.0737*
	(0.0375)	(0.0296)	(0.0290)	(0.0372)	(0.0383)
Results in 1993					
Panel D: Baseline Results with Geographical Controls					
Local Lords' Estates Zone	0.00147	-0.0268	-0.0511	-0.0754	0.0411
	(0.0353)	(0.0370)	(0.0434)	(0.0477)	(0.0845)
Panel E: Panel D with Industry Fixed Effects					
Local Lords' Estates Zone	0.0271	0.00670	0.0305	0.0708**	0.0959***
	(0.0298)	(0.0231)	(0.0280)	(0.0292)	(0.0365)
Panel F: Panel E with Controlling for Stories					
Local Lords' Estates Zone	0.0222	0.00623	0.0214	0.0595**	0.0989***
	(0.0221)	(0.0261)	(0.0286)	(0.0288)	(0.0359)

Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
In Panels A and C, we control for geographical variables used in the main specification, *Distance from the Center (Castle)*, *Mean of Altitude*, *S.D. of Altitude*, *West of the Yamanote Line*, and *Earthquake Risk*. In Panels B and D, we also include two-digit-level industry fixed effects, corresponding to Figure 9(c). We add the mean of stories (aboveground) as an additional control in Panels C and F, corresponding to Figure 9(d).
The number of observations (firms) in Panels A , B, and C (Panel D, E, and F) is 7491 (8206).

Table A.16: Controlling for Public Infrastructure (OLS)

	(1)	(2)	(3)	(4)	(5)
Panel A: Number of Lots in 1872					
Local Lords' Estates Share	-11.50***	-11.48***	-11.41***	-11.22***	-11.21***
	(0.685)	(0.669)	(0.645)	(0.674)	(0.638)
Panel B: Number of Lots in 2008-2011					
Local Lords' Estates Share	-19.49***	-14.26***	-15.07***	-18.76***	-10.82***
	(2.695)	(2.370)	(2.233)	(2.649)	(1.861)
Panel C: Number of Buildings in 2011					
Local Lords' Estates Share	-10.36***	-6.132***	-7.653***	-10.38***	-4.568***
	(1.652)	(1.408)	(1.414)	(1.646)	(1.224)
Panel D: Stories (aboveground) in 2011					
Local Lords' Estates Share	0.845***	0.714**	1.075***	0.890***	0.843***
	(0.305)	(0.281)	(0.296)	(0.297)	(0.267)
Panel E: Number of Buildings >= 30 Stories in 2011					
Local Lords' Estates Share	0.0360***	0.0352***	0.0399***	0.0350**	0.0354***
	(0.0139)	(0.0136)	(0.0141)	(0.0140)	(0.0136)
Panel F: Log Land Price in 2012					
Local Lords' Estates Share	0.200***	0.115**	0.207***	0.205***	0.132***
	(0.0567)	(0.0483)	(0.0565)	(0.0529)	(0.0457)
Road Width	No	Yes	No	No	Yes
Hospital, University, and Parks	No	No	Yes	No	Yes
Distance to Nearest Station in 2018 and 1950	No	No	No	Yes	Yes
Distance from the Center (Castle)	Yes	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes	Yes
Lon and Lat Controls	Yes	Yes	Yes	Yes	Yes
Earthquake Risk	Yes	Yes	Yes	Yes	Yes
N in Panel A	5488	5117	5488	5488	5117
N in Panel B	9101	8527	9101	9101	8527
N in Panel C	9542	9003	9542	9542	9003
N in Panel D	9542	9003	9542	9542	9003
N in Panel E	9542	9003	9542	9542	9003
N in Panel F	8971	8909	8971	8971	8909

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables. *Road Width* is the average road width. *Hospital, University, and Parks* is the share of land used as hospitals or universities, or parks. *Distance to Nearest Station in 2018 and 1950* is the distance to the nearest station in 2018 and 1950 (including tram stations).

Table A.17: Controlling for Public Infrastructure (Local Randomization)

	(1)	(2)	(3)	(4)	(5)
Panel I: Local Lords' Estates Share					
Local Lords' Estates Zone	0.443***	0.417***	0.448***	0.442***	0.417***
	(0.0868)	(0.0831)	(0.0848)	(0.0809)	(0.0775)
Panel A: Number of Lots in 1872					
Local Lords' Estates Zone	-10.39***	-9.540***	-10.35***	-10.33***	-9.269***
	(2.080)	(2.009)	(2.067)	(2.175)	(2.059)
Panel B: Number of Lots in 2008-2011					
Local Lords' Estates Zone	-21.16***	-15.56***	-20.97***	-21.39***	-15.28***
	(6.481)	(5.588)	(6.471)	(5.798)	(5.095)
Panel C: Number of Buildings in 2011					
Local Lords' Estates Zone	-10.04***	-6.706**	-9.967***	-10.49***	-6.931**
	(3.834)	(3.136)	(3.823)	(3.435)	(2.839)
Panel D: Stories (aboveground) in 2011					
Local Lords' Estates Zone	2.578***	2.197***	2.610***	2.510***	2.079***
	(0.872)	(0.745)	(0.883)	(0.859)	(0.699)
Panel E: Number of Buildings >= 30 Stories in 2011					
Local Lords' Estates Zone	0.129**	0.121**	0.131**	0.122**	0.114**
	(0.0538)	(0.0487)	(0.0542)	(0.0556)	(0.0485)
Panel F: Log Land Price in 2012					
Local Lords' Estates Zone	0.350	0.181	0.363*	0.366*	0.203
	(0.218)	(0.183)	(0.216)	(0.216)	(0.185)
Panel G: Log Land Price in 2012					
Local Lords' Estates Zone (Central)	0.878***	0.591**	0.890***	0.748***	0.474**
	(0.248)	(0.239)	(0.255)	(0.243)	(0.227)
Local Lords' Estates Zone (Non-Central)	-0.262	-0.246	-0.248	-0.0893	-0.0944
	(0.288)	(0.275)	(0.279)	(0.290)	(0.262)
Road Width	No	Yes	No	No	Yes
Hospital, University, and Parks	No	No	Yes	No	Yes
Distance to Nearest Station in 2018 and 1950	No	No	No	Yes	Yes
Distance from the Center (Castle)	Yes	Yes	Yes	Yes	Yes
West of the Yamanote line	Yes	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes	Yes
Earthquake Risk	Yes	Yes	Yes	Yes	Yes
N in Panel I	351	338	351	351	338
N in Panel A	350	336	350	350	336
N in Panel B	352	338	352	352	338
N in Panel C	351	338	351	351	338
N in Panel D	351	338	351	351	338
N in Panel E	351	338	351	351	338
N in Panel F	341	336	341	341	336
N in Panel G	341	336	341	341	336

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables. *Road Width* is the average road width. *Hospital, University, and Parks* is the share of land used as hospitals or universities, or parks. *Distance to Nearest Station in 2018 and 1950* is the distance to the nearest station in 2018 and 1950 (including tram stations).

Table A.18: Quantile Regressions on Firm Productivity with Public Infrastructure (OLS Sample)

	Log Revenue / Worker				
	Percentiles				
	10	25	50	75	90
	(1)	(2)	(3)	(4)	(5)
Results in 2017					
Panel A: Geographical Controls, Industry Fixed Effects, and Public Amenities					
Local Lords' Estates	0.0227*	0.0457***	0.0438***	0.0526***	0.0766***
	(0.0136)	(0.0109)	(0.0112)	(0.0146)	(0.0187)
Panel B: Panel A with Controlling for Stories					
Local Lords' Estates	0.00998	0.0342***	0.0261**	0.0258*	0.0514***
	(0.0151)	(0.0103)	(0.0114)	(0.0141)	(0.0197)
Results in 1993					
Panel C: Geographical Controls, Industry Fixed Effects, and Public Amenities					
Local Lords' Estates	-0.000173	0.00740	0.00930	0.0361***	0.0368**
	(0.0128)	(0.0110)	(0.0104)	(0.0124)	(0.0163)
Panel D: Panel C with Controlling for Stories					
Local Lords' Estates	-0.00138	0.00506	0.00251	0.0261**	0.0203
	(0.0119)	(0.0110)	(0.0102)	(0.0127)	(0.0165)

Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
In Panels A and C, we control for geographical variables used in the main specification, *Distance from the Center (Castle)*, *Mean of Altitude*, *S.D. of Altitude*, two-digit-level industry fixed effects, and *Road Width*, *Hospital, University, and Parks*, and *Distance to Nearest Station in 2018 and 1950*. We add the mean of stories (aboveground) as an additional control in Panels B and D.
The number of observations (firms) in Panels A–C (Panels D–F) is 79471 (84617).

Table A.19: Quantile Regressions on Firm Productivity with Public Infrastructure (Local Randomization)

	Log Revenue / Worker				
	Percentiles				
	10	25	50	75	90
	(1)	(2)	(3)	(4)	(5)
Results in 2017					
Panel A: Geographical Controls, Industry Fixed Effects, and Public Amenities					
Local Lords' Estates Zone	-0.0151	0.0598*	0.0776**	0.105***	0.156***
	(0.0443)	(0.0307)	(0.0306)	(0.0361)	(0.0466)
Panel B: Panel A with Controlling for Stories					
Local Lords' Estates Zone	-0.0596	0.000359	0.0249	0.0301	0.0991**
	(0.0409)	(0.0276)	(0.0316)	(0.0381)	(0.0460)
Results in 1993					
Panel C: Geographical Controls, Industry Fixed Effects, and Public Amenities					
Local Lords' Estates Zone	-0.00760	-0.00450	0.0113	0.0683**	0.0863***
	(0.0328)	(0.0237)	(0.0314)	(0.0304)	(0.0314)
Panel D: Panel C with Controlling for Stories					
Local Lords' Estates Zone	-0.00217	-0.00398	0.0124	0.0720**	0.0949***
	(0.0353)	(0.0224)	(0.0311)	(0.0309)	(0.0358)

Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
In Panels A and C, we control for geographical variables used in the main specification, *Distance from the Center (Castle)*, *Mean of Altitude*, *S.D. of Altitude*, *West of the Yamanote Line*, *Earthquake Risk*, two-digit-level industry fixed effects, *Road Width*, *Hospital, University, and Parks*, and *Distance to Nearest Station in 2018 and 1950*. We add the mean of stories (aboveground) as an additional control in Panels B and D.
The number of observations (firms) in Panels A and B (Panels C and D) is 7397 (8137).

Table A.20: Controlling for Block Size or FAR (OLS)

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1872				
Local Lords' Estates Share	-11.50***	-10.54***	-11.72***	-11.24***
	(0.685)	(0.693)	(0.671)	(0.663)
Panel B: Number of Lots in 2008-2011				
Local Lords' Estates Share	-19.49***	-12.86***	-16.08***	-12.35***
	(2.695)	(2.544)	(2.522)	(2.345)
Panel C: Number of Buildings in 2011				
Local Lords' Estates Share	-10.36***	-6.325***	-7.943***	-5.602***
	(1.652)	(1.531)	(1.466)	(1.347)
Panel D: Stories (aboveground) in 2011				
Local Lords' Estates Share	0.845***	1.077***	0.885***	0.938***
	(0.305)	(0.303)	(0.255)	(0.253)
Panel E: Number of Buildings >= 30 Stories in 2011				
Local Lords' Estates Share	0.0360***	0.0377***	0.0392***	0.0387***
	(0.0139)	(0.0143)	(0.0140)	(0.0139)
Panel F: Log Land Price in 2012				
Local Lords' Estates Share	0.200***	0.180***	0.165***	0.148***
	(0.0567)	(0.0569)	(0.0461)	(0.0459)
Block Size	No	Yes	No	Yes
FAR Regulation	No	No	Yes	Yes
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes
Lon and Lat Controls	Yes	Yes	Yes	Yes
Earthquake Risk	Yes	Yes	Yes	Yes
N in Panel A	5488	5487	5114	5113
N in Panel B	9101	9095	8521	8518
N in Panel C	9542	9541	9001	9000
N in Panel D	9542	9541	9001	9000
N in Panel E	9542	9541	9001	9000
N in Panel F	8971	8968	8909	8906

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.21: Controlling for Block Size or FAR (Local Randomization)

	(1)	(2)	(3)
Panel I: Local Lords' Estates Share			
Local Lords' Estates Zone	0.443***	0.454***	0.399***
	(0.0868)	(0.0853)	(0.0822)
Panel A: Number of Lots in 1872			
Local Lords' Estates Zone	-10.39***	-10.50***	-9.765***
	(2.080)	(2.114)	(2.040)
Panel B: Number of Lots in 2008-2011			
Local Lords' Estates Zone	-21.16***	-20.49***	-18.01***
	(6.481)	(6.435)	(6.360)
Panel C: Number of Buildings in 2011			
Local Lords' Estates Zone	-10.04***	-9.878**	-8.086**
	(3.834)	(3.846)	(3.426)
Panel D: Stories (aboveground) in 2011			
Local Lords' Estates Zone	2.578***	2.660***	2.331***
	(0.872)	(0.848)	(0.800)
Panel E: Number of Buildings >= 30 Stories in 2011			
Local Lords' Estates Zone	0.129**	0.124**	0.123**
	(0.0538)	(0.0527)	(0.0514)
Panel F: Log Land Price in 2012			
Local Lords' Estates Zone	0.350	0.331	0.192
	(0.218)	(0.221)	(0.142)
Panel G: Log Land Price in 2012			
Local Lords' Estates Zone (Central)	0.878***	0.863***	0.513**
	(0.248)	(0.260)	(0.205)
Local Lords' Estates Zone (Non-Central)	-0.262	-0.265	-0.152
	(0.288)	(0.292)	(0.180)
Block Size	No	Yes	No
FAR Regulation	No	No	Yes
Distance from the Center (Castle)	Yes	Yes	Yes
West of the Yamanote line	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes
Earthquake Risk	Yes	Yes	Yes
N in Panel I	351	351	338
N in Panel A	350	350	336
N in Panel B	352	352	338
N in Panel C	351	351	338
N in Panel D	351	351	338
N in Panel E	351	351	338
N in Panel F	341	341	336
N in Panel G	341	341	336

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.22: Controlling for Initial Land Price in 1876 (OLS)

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1872 (N: 3605)				
Local Lords' Estates Share	-12.73***	-12.47***	-12.86***	-12.56***
	(0.719)	(0.702)	(0.734)	(0.730)
Panel B: Number of Lots in 2008-2011 (N: 3614)				
Local Lords' Estates Share	-18.64***	-18.22***	-17.78***	-17.18***
	(3.666)	(3.656)	(3.527)	(3.609)
Panel C: Number of Buildings in 2011 (N: 3605)				
Local Lords' Estates Share	-9.501***	-9.442***	-6.930***	-6.808***
	(2.223)	(2.230)	(2.266)	(2.304)
Panel D: Stories (aboveground) in 2011 (N: 3605)				
Local Lords' Estates Share	1.787***	1.809***	1.244***	1.270***
	(0.406)	(0.406)	(0.380)	(0.381)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 3605)				
Local Lords' Estates Share	0.0748***	0.0741***	0.0581***	0.0568***
	(0.0199)	(0.0199)	(0.0196)	(0.0197)
Panel F: Log Land Price in 2012 (N: 3467)				
Local Lords' Estates Share	0.327***	0.331***	0.116	0.119
	(0.103)	(0.102)	(0.0810)	(0.0787)
Log Land Price in 1876	No	Yes	No	Yes
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes
Lon and Lat Controls	No	No	Yes	Yes
Earthquake Risk	No	No	Yes	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.23: Controlling for Initial Land Price in 1876 (Local Randomization)

	(1)	(2)	(3)	(4)
Panel I: Local Lords' Estates Share (N: 319)				
Local Lords' Estates Zone	0.605***	0.518***	0.523***	0.502***
	(0.0734)	(0.0823)	(0.0633)	(0.0642)
Panel A: Number of Lots in 1872 (N: 319)				
Local Lords' Estates Zone	-11.83***	-7.900***	-10.40***	-8.456***
	(1.933)	(1.762)	(2.127)	(2.201)
Panel B: Number of Lots in 2008-2011 (N: 319)				
Local Lords' Estates Zone	-20.79***	-10.46	-19.68***	-15.40**
	(7.725)	(7.191)	(6.538)	(5.972)
Panel C: Number of Buildings in 2011 (N: 319)				
Local Lords' Estates Zone	-8.383*	-2.788	-9.625**	-7.669**
	(4.844)	(4.809)	(3.849)	(3.611)
Panel D: Stories (aboveground) in 2011 (N: 319)				
Local Lords' Estates Zone	1.925**	1.040	2.439***	1.871***
	(0.803)	(0.728)	(0.719)	(0.644)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 319)				
Local Lords' Estates Zone	0.123**	0.0654*	0.150**	0.108**
	(0.0519)	(0.0367)	(0.0588)	(0.0490)
Panel F: Log Land Price in 2012 (N: 309)				
Local Lords' Estates Zone	0.141	-0.0742	0.457**	0.457**
	(0.356)	(0.338)	(0.183)	(0.185)
Log Land Price in 1876	No	Yes	No	Yes
Distance from the Center (Castle)	No	No	Yes	Yes
West of the Yamanote line	No	No	Yes	Yes
Mean of Altitude	No	No	Yes	Yes
S.D. of Altitude	No	No	Yes	Yes
Earthquake Risk	No	No	Yes	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.24: Controlling for Destruction during WWII (OLS, Central vs Non-Central)

	Inside vs Outside the Circle (*Yamanote*) Line					
	300 m		1000 m		2000 m	
	Inside	Outside	Inside	Outside	Inside	Outside
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Number of Lots in 1872						
Local Lords' Estates Share	-10.60***	-9.442***	-11.08***	-7.696***	-10.99***	-6.241***
	(0.728)	(1.152)	(0.713)	(1.204)	(0.686)	(1.228)
Panel B: Number of Lots in 2008-2011						
Local Lords' Estates Share	-19.16***	-3.913	-17.44***	-2.753	-16.82***	0.959
	(2.648)	(5.156)	(2.674)	(4.206)	(2.591)	(5.307)
Panel C: Number of Buildings in 2011						
Local Lords' Estates Share	-9.306***	-0.659	-7.967***	-0.468	-7.733***	3.860
	(1.678)	(3.694)	(1.693)	(3.384)	(1.638)	(4.082)
Panel D: Stories (aboveground) in 2011						
Local Lords' Estates Share	0.995***	-0.0374	0.795**	0.616	0.737**	0.349
	(0.319)	(0.603)	(0.322)	(0.706)	(0.311)	(0.789)
Panel E: Number of Buildings >= 30 Stories in 2011						
Local Lords' Estates Share	0.0429***	-0.00198	0.0398***	0.00986	0.0357**	0.0327
	(0.0158)	(0.0197)	(0.0153)	(0.0248)	(0.0145)	(0.0222)
Panel F: Log Land Price in 2012						
Local Lords' Estates Share	0.253***	-0.140**	0.181***	-0.0000950	0.176***	-0.0376
	(0.0507)	(0.0686)	(0.0582)	(0.0402)	(0.0582)	(0.0386)
WWII Destruction	Yes	Yes	Yes	Yes	Yes	Yes
Distance from the Center (Castle)	Yes	Yes	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes	Yes	Yes
Lon and Lat Controls	Yes	Yes	Yes	Yes	Yes	Yes
Earthquake Risk	Yes	Yes	Yes	Yes	Yes	Yes
N in Panel A	3513	1975	4003	1485	4660	828
N in Panel B	6137	2964	7160	1941	7977	1124
N in Panel C	6144	3398	7333	2209	8315	1227
N in Panel D	6144	3398	7333	2209	8315	1227
N in Panel E	6144	3398	7333	2209	8315	1227
N in Panel F	5704	3267	6855	2116	7811	1160

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables.

Table A.25: Controlling for Destruction during WWII (Local Randomization, Central vs Non-Central)

	(1)	(2)	(3)
Panel I: Local Lords' Estates Share (N: 351)			
Local Lords' Estates Zone (Central)	0.564***	0.518***	0.442***
	(0.107)	(0.0875)	(0.0985)
Local Lords' Estates Zone (Non-Central)	0.486***	0.483***	0.437***
	(0.116)	(0.132)	(0.122)
Panel A: Number of Lots in 1872 (N: 350)			
Local Lords' Estates Zone (Central)	-13.77***	-10.63***	-10.63***
	(1.351)	(1.991)	(1.864)
Local Lords' Estates Zone (Non-Central)	-5.923***	-9.327***	-7.230***
	(2.019)	(2.307)	(2.331)
Panel B: Number of Lots in 2008-2011 (N: 352)			
Local Lords' Estates Zone (Central)	-40.04***	-34.50***	-32.81***
	(6.403)	(5.948)	(7.194)
Local Lords' Estates Zone (Non-Central)	3.812	-6.297	-5.043
	(7.729)	(7.890)	(7.857)
Panel C: Number of Buildings in 2011 (N: 351)			
Local Lords' Estates Zone (Central)	-20.70***	-18.76***	-19.08***
	(3.238)	(3.079)	(3.532)
Local Lords' Estates Zone (Non-Central)	6.893	0.495	1.671
	(5.586)	(5.561)	(5.502)
Panel D: Stories (aboveground) in 2011 (N: 351)			
Local Lords' Estates Zone (Central)	3.306***	4.335***	3.617**
	(1.048)	(1.250)	(1.469)
Local Lords' Estates Zone (Non-Central)	-0.423	0.135	0.789
	(0.634)	(0.734)	(0.699)
Panel E: Number of Buildings >= 30 Stories in 2011 (N: 351)			
Local Lords' Estates Zone (Central)	0.174***	0.224***	0.204***
	(0.0591)	(0.0761)	(0.0758)
Local Lords' Estates Zone (Non-Central)	-0.0320*	-0.0438	0.00387
	(0.0191)	(0.0412)	(0.0369)
Panel F: Log Land Price in 2012 (N: 341)			
Local Lords' Estates Zone (Central)	0.933***	1.097***	0.902***
	(0.326)	(0.262)	(0.279)
Local Lords' Estates Zone (Non-Central)	-0.868***	-0.356	-0.252
	(0.301)	(0.296)	(0.291)
WWII Destruction	Yes	Yes	Yes
Distance from the Center (Castle)	No	Yes	Yes
West of the Yamanote line	No	Yes	Yes
Mean of Altitude	No	No	Yes
S.D. of Altitude	No	No	Yes
Earthquake Risk	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.26: Controlling for Destruction during WWII (OLS, Before vs After WWII)

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1912 (N: 8133)				
Local Lords' Estates Share	-11.72***	-10.72***	-11.72***	-11.09***
	(0.547)	(0.538)	(0.547)	(0.561)
Panel B: Number of Lots in 1931 (N: 7830)				
Local Lords' Estates Share	-9.239***	-7.935***	-9.239***	-8.261***
	(0.845)	(0.829)	(0.845)	(0.837)
Panel C: Log Land Price in 1912 (N: 7122)				
Local Lords' Estates Share	-0.312***	-0.334***	-0.312***	-0.509***
	(0.103)	(0.103)	(0.103)	(0.101)
Panel D: Log Land Price in 1931 (N: 4711)				
Local Lords' Estates Share	-0.525***	-0.512***	-0.525***	-0.686***
	(0.119)	(0.121)	(0.119)	(0.112)
Panel E: Log Land Rental Price in 1931 (N: 7024)				
Local Lords' Estates Share	-0.319***	-0.309***	-0.319***	-0.390***
	(0.0856)	(0.0863)	(0.0856)	(0.0803)
Panel F: Log Land Price in 1972 (N: 6071)				
Local Lords' Estates Share	-0.0615	-0.0739	-0.0615	-0.0527
	(0.0482)	(0.0460)	(0.0482)	(0.0408)
Panel G: Log Land Price in 1983 (N: 3276)				
Local Lords' Estates Share	0.0562	0.0290	0.0562	-0.00405
	(0.0569)	(0.0548)	(0.0569)	(0.0446)
Panel H: Log Land Price in 2012 (N: 8971)				
Local Lords' Estates Share	0.321***	0.281***	0.321***	0.192***
	(0.0728)	(0.0696)	(0.0728)	(0.0552)
WWII Destruction	No	Yes	No	Yes
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes
Lon and Lat Controls	No	No	No	Yes
Earthquake Risk	No	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.27: Controlling for Destruction during WWII (Local Randomization, Before vs After WWII)

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1912 (N: 343)				
Local Lords' Estates Zone	-10.63***	-8.774***	-9.525***	-7.915***
	(1.782)	(1.582)	(2.095)	(1.821)
Panel B: Number of Lots in 1931 (N: 347)				
Local Lords' Estates Zone	-10.25***	-8.830***	-9.269***	-8.020***
	(1.746)	(1.847)	(2.028)	(2.063)
Panel C: Log Land Price in 1912 (N: 294)				
Local Lords' Estates Zone	-0.785***	-0.760***	-0.627***	-0.621***
	(0.212)	(0.218)	(0.213)	(0.224)
Panel D: Log Land Price in 1931 (N: 268)				
Local Lords' Estates Zone	-0.506***	-0.481**	-0.390*	-0.363
	(0.194)	(0.213)	(0.215)	(0.229)
Panel E: Log Land Rental Price in 1931 (N: 299)				
Local Lords' Estates Zone	-0.298**	-0.250	-0.306*	-0.255
	(0.145)	(0.157)	(0.170)	(0.177)
Panel F: Log Land Price in 1972 (N: 279)				
Local Lords' Estates Zone	0.0351	0.0280	-0.0540	-0.0368
	(0.161)	(0.153)	(0.169)	(0.170)
Panel G: Log Land Price in 1983 (N: 157)				
Local Lords' Estates Zone	0.110	0.0792	0.0624	0.0523
	(0.145)	(0.147)	(0.158)	(0.168)
Panel H: Log Land Price in 2012 (N: 341)				
Local Lords' Estates Zone	0.445*	0.405*	0.350	0.342
	(0.265)	(0.244)	(0.218)	(0.221)
WWII Destruction	No	Yes	No	Yes
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
West of the Yamanote line	Yes	Yes	Yes	Yes
Mean of Altitude	No	No	Yes	Yes
S.D. of Altitude	No	No	Yes	Yes
Earthquake Risk	No	No	Yes	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables.

Table A.28: Controlling for Land Use/Ownership in 1931 (OLS, Before vs After WWII)

	(1)	(2)	(3)	(4)
Panel A: Number of Lots in 1912 (N: 7319)				
Local Lords' Estates Share	-12.04***	-11.79***	-11.93***	-11.62***
	(0.572)	(0.578)	(0.589)	(0.595)
Panel B: Number of Lots in 1931 (N: 7830)				
Local Lords' Estates Share	-9.467***	-9.403***	-8.895***	-8.905***
	(0.874)	(0.889)	(0.907)	(0.926)
Panel C: Log Land Price in 1912 (N: 6552)				
Local Lords' Estates Share	-0.581***	-0.596***	-0.539***	-0.566***
	(0.104)	(0.105)	(0.102)	(0.105)
Panel D: Log Land Price in 1931 (N: 4711)				
Local Lords' Estates Share	-0.764***	-0.792***	-0.684***	-0.749***
	(0.109)	(0.110)	(0.109)	(0.109)
Panel E: Log Land Rental Price in 1931 (N: 7024)				
Local Lords' Estates Share	-0.460***	-0.480***	-0.382***	-0.461***
	(0.0805)	(0.0817)	(0.0794)	(0.0817)
Panel F: Log Land Price in 1972 (N: 5080)				
Local Lords' Estates Share	-0.0440	-0.0439	-0.0447	-0.0399
	(0.0412)	(0.0414)	(0.0406)	(0.0421)
Panel G: Log Land Price in 1983 (N: 2770)				
Local Lords' Estates Share	0.00269	0.00468	0.000996	0.0109
	(0.0444)	(0.0448)	(0.0436)	(0.0455)
Panel H: Log Land Price in 2012 (N: 7332)				
Local Lords' Estates Share	0.170***	0.172***	0.169***	0.178***
	(0.0555)	(0.0557)	(0.0558)	(0.0575)
Remaining Estates in 1931	Yes	No	No	Yes
Other Lords' Land in 1931	No	Yes	No	Yes
Military Use in 1931	No	No	Yes	Yes
Distance from the Center (Castle)	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes
Lon and Lat Controls	Yes	Yes	Yes	Yes
Earthquake Risk	Yes	Yes	Yes	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables. *Remaining Estates in 1931* is the share of land used as an estate for the descendants of local lords in 1931. *Other Lords' Land in 1931* is the share of land owned by the descendants of local lords, not as their estate. *Military Use in 1931* is the share of land used for military purpose.

Table A.29: Controlling for Land Use/Ownership in 1931 (Local Randomization, Before vs After WWII)

	(1)	(2)	(3)
Panel I: Local Lords' Estates Share (N: 347)			
Local Lords' Estates Zone	0.523***	0.480***	0.413***
	(0.0829)	(0.0818)	(0.0888)
Panel A: Number of Lots in 1912 (N: 339)			
Local Lords' Estates Zone	-11.18***	-10.19***	-9.145***
	(2.089)	(1.870)	(2.151)
Panel B: Number of Lots in 1931 (N: 347)			
Local Lords' Estates Zone	-9.823***	-10.36***	-9.399***
	(2.602)	(1.832)	(2.123)
Panel C: Log Land Price in 1912 (N: 293)			
Local Lords' Estates Zone	-0.786***	-0.698***	-0.555**
	(0.220)	(0.223)	(0.220)
Panel D: Log Land Price in 1931 (N: 268)			
Local Lords' Estates Zone	-0.737***	-0.535***	-0.429*
	(0.194)	(0.204)	(0.224)
Panel E: Log Land Rental Price in 1931 (N: 299)			
Local Lords' Estates Zone	-0.493***	-0.316**	-0.322*
	(0.156)	(0.153)	(0.174)
Panel F: Log Land Price in 1972 (N: 279)			
Local Lords' Estates Zone	-0.250	0.0582	-0.0375
	(0.236)	(0.165)	(0.170)
Panel G: Log Land Price in 1983 (N: 157)			
Local Lords' Estates Zone	-0.0896	0.127	0.0730
	(0.224)	(0.149)	(0.160)
Panel H: Log Land Price in 2012 (N: 339)			
Local Lords' Estates Zone	0.213	0.488*	0.378*
	(0.334)	(0.261)	(0.219)
Remaining Estates in 1931	Yes	Yes	Yes
Distance from the Center (Castle)	No	Yes	Yes
West of the Yamanote line	No	Yes	Yes
Mean of Altitude	No	No	Yes
S.D. of Altitude	No	No	Yes
Earthquake Risk	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
See Table 1 for the definitions of variables. *Remaining Estates in 1931* is the share of land used as an estate for the descendants of local lords in 1931.
There was no other lords' land other than their estate or military land in 1931 in this sample.

Table A.30: Controlling for Land Use/Ownership in 1931 (OLS, Central vs Non-Central)

	Inside vs Outside the Circle (*Yamanote*) Line					
	300 m		1000 m		2000 m	
	Inside	Outside	Inside	Outside	Inside	Outside
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Number of Lots in 1872						
Local Lords' Estates Share	-11.59***	-9.209***	-12.20***	-7.340***	-12.03***	-5.734***
	(0.802)	(1.145)	(0.725)	(1.114)	(0.704)	(1.384)
Panel B: Number of Lots in 2008-2011						
Local Lords' Estates Share	-23.12***	-5.655	-21.55***	-5.868	-20.66***	0.218
	(2.942)	(4.367)	(2.917)	(4.230)	(2.799)	(5.477)
Panel C: Number of Buildings in 2011						
Local Lords' Estates Share	-11.73***	-2.981	-10.42***	-4.061	-10.16***	3.259
	(1.873)	(3.288)	(1.872)	(3.408)	(1.797)	(4.223)
Panel D: Stories (aboveground) in 2011						
Local Lords' Estates Share	1.148***	0.555	1.069***	0.798	1.038***	0.192
	(0.344)	(0.572)	(0.343)	(0.641)	(0.326)	(0.737)
Panel E: Number of Buildings >= 30 Stories in 2011						
Local Lords' Estates Share	0.0498***	0.0149	0.0501***	0.0178	0.0458***	0.0246
	(0.0174)	(0.0166)	(0.0169)	(0.0198)	(0.0159)	(0.0169)
Panel F: Log Land Price in 2012						
Local Lords' Estates Share	0.253***	-0.101*	0.188***	0.0166	0.178***	-0.0391
	(0.0542)	(0.0605)	(0.0617)	(0.0384)	(0.0601)	(0.0323)
Remaining Estates in 1931	Yes	No	Yes	No	Yes	No
Other Lords' Land in 1931	Yes	Yes	Yes	Yes	Yes	Yes
Military Use in 1931	Yes	Yes	Yes	Yes	Yes	No
Distance from the Center (Castle)	Yes	Yes	Yes	Yes	Yes	Yes
Mean of Altitude	Yes	Yes	Yes	Yes	Yes	Yes
S.D. of Altitude	Yes	Yes	Yes	Yes	Yes	Yes
Lon and Lat Controls	Yes	Yes	Yes	Yes	Yes	Yes
Earthquake Risk	Yes	Yes	Yes	Yes	Yes	Yes
N in Panel A	3361	1926	3817	1470	4465	822
N in Panel B	5269	2514	5955	1828	6700	1083
N in Panel C	5237	2489	5922	1804	6663	1063
N in Panel D	5237	2489	5922	1804	6663	1063
N in Panel E	5237	2489	5922	1804	6663	1063
N in Panel F	4925	2407	5596	1736	6314	1018

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables. *Remaining Estates in 1931* is the share of land used as an estate for the descendants of local lords in 1931. *Other Lords' Land in 1931* is the share of land owned by the descendants of local lords, not as their estate. *Military Use in 1931* is the share of land used for military purpose.

Military Use in 1931 takes zero in column (6), and *Other Lords' Land in 1931* takes zero in columns (4) and (6).

Table A.31: Controlling for Land Use/Ownership in 1931 (Local Randomization, Central vs Non-Central)

	(1)	(2)	(3)
Panel I: Local Lords' Estates Share (N: 347)			
Local Lords' Estates Zone (Central)	0.563***	0.510***	0.429***
	(0.108)	(0.0831)	(0.0940)
Local Lords' Estates Zone (Non-Central)	0.455***	0.435***	0.394***
	(0.117)	(0.135)	(0.127)
Panel A: Number of Lots in 1912 (N: 339)			
Local Lords' Estates Zone (Central)	-15.17***	-12.14***	-12.16***
	(1.738)	(1.939)	(1.864)
Local Lords' Estates Zone (Non-Central)	-4.710**	-7.585***	-5.684**
	(1.829)	(2.656)	(2.812)
Panel B: Number of Lots in 1931 (N: 347)			
Local Lords' Estates Zone (Central)	-14.53***	-12.44***	-12.24***
	(2.761)	(2.557)	(2.947)
Local Lords' Estates Zone (Non-Central)	-1.602	-7.340**	-5.722**
	(2.592)	(3.075)	(2.788)
Panel C: Log Land Price in 1912 (N: 293)			
Local Lords' Estates Zone (Central)	-1.160***	-0.881**	-0.696**
	(0.350)	(0.358)	(0.351)
Local Lords' Estates Zone (Non-Central)	-0.399***	-0.475*	-0.400*
	(0.135)	(0.260)	(0.213)
Panel D: Log Land Price in 1931 (N: 268)			
Local Lords' Estates Zone (Central)	-1.040***	-0.826***	-0.922***
	(0.298)	(0.303)	(0.324)
Local Lords' Estates Zone (Non-Central)	-0.457***	-0.294	-0.0162
	(0.148)	(0.209)	(0.142)
Panel E: Log Land Rental Price in 1931 (N: 299)			
Local Lords' Estates Zone (Central)	-0.590***	-0.381*	-0.474**
	(0.224)	(0.226)	(0.237)
Local Lords' Estates Zone (Non-Central)	-0.389**	-0.235	-0.157
	(0.171)	(0.186)	(0.185)
Panel F: Log Land Price in 2012 (N: 339)			
Local Lords' Estates Zone (Central)	0.906***	1.076***	0.863***
	(0.323)	(0.244)	(0.249)
Local Lords' Estates Zone (Non-Central)	-0.911***	-0.335	-0.233
	(0.302)	(0.299)	(0.291)
Remaining Estates in 1931	Yes	Yes	Yes
Distance from the Center (Castle)	No	Yes	Yes
West of the Yamanote line	No	Yes	Yes
Mean of Altitude	No	No	Yes
S.D. of Altitude	No	No	Yes
Earthquake Risk	No	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables. *Remaining Estates in 1931* is the share of land used as an estate for the descendants of local lords in 1931.

There was no other lords' land other than their estate or military land in 1931 in this sample.

Table A.32: Using The Number of Lots in the 1872 as the Treatment Variable

	(1)	(2)
Panel A: Number of Lots in 2008-2011 (N: 5435)		
Number of Lots in 1872	1.776***	1.484***
	(0.242)	(0.246)
Panel B: Number of Buildings in 2011 (N: 5365)		
Number of Lots in 1872	1.021***	0.624***
	(0.155)	(0.151)
Panel C: Stories (aboveground) in 2011 (N: 5365)		
Number of Lots in 1872	-0.154***	-0.0941***
	(0.0400)	(0.0344)
Panel D: Number of Buildings >= 30 Stories in 2011 (N: 5365)		
Number of Lots in 1872	-0.00599***	-0.00457***
	(0.00182)	(0.00166)
Panel E: Log Land Price in 2012 (N: 5058)		
Number of Lots in 1872	-0.0388***	-0.0128**
	(0.00792)	(0.00562)
Distance from the Center (Castle)	Yes	Yes
Mean of Altitude	Yes	Yes
S.D. of Altitude	Yes	Yes
Lon and Lat Controls	No	Yes
Earthquake Risk	No	Yes

Standard errors are in parentheses. We allow a within-300 m correlation in the error terms. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

See Table 1 for the definitions of variables. We use *Local Lords' Estates Share* as an instrumental variable.