

# Land Reform at the Parcel Level: A Spatial Reconstruction from a Korean Village, 1915–2023

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## Abstract

Land reforms are among the largest asset redistributions that governments undertake, but their long-run consequences are rarely traced at the level of the individual parcel. We link the mapped parcels of one Korean village through the 1950 land reform, using a colonial tax ledger, cadastral maps, the modern cadastral register, and geocoded business-license records that together span a century. The analysis is descriptive. We observe the 1945 ledger owner class of each classified plot but not its statutory reform path, so we report associations with owner class and not effects of redistribution. Our main finding concerns spatial structure before the reform. The mapped holdings of the village's large owners were already scattered before 1950. There were few large blocks of land for the reform to break up. Complementary comparisons show small adjusted differences in later official assessed values, while estimates for commercial activity and land-use conversion remain uncertain. Recorded ownership events provide partial evidence on the intervening decades, including preservation entries clustered in 1965, but they cannot establish when all parcels acquired clear title. The parcel-level reconstruction tests an assumption about pre-reform spatial structure that ownership totals alone cannot test.

**Keywords:** land reform; cadastral records; land fragmentation; parcel-level data; South Korea

**JEL classification:** N55; Q15; R14

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# 1 Introduction

Land reforms are among the largest redistributions of assets that governments undertake. A substantial literature studies their consequences for agricultural productivity, human capital, and structural change.<sup>1</sup> Nearly all of this evidence is aggregated. Studies measure exposure at the level of counties, districts, or households and do not follow the land itself, which is the asset actually redistributed. Aggregation requires an assumption about what a reform does to the land, and the standard assumption is fragmentation. Under this assumption, landlords hold consolidated estates, the reform divides them, and the loss of scale and the difficulty of assembling land create long-run costs.

Whether that assumption holds depends on how land was held before the reform. In plantation economies, such as the sugar and coffee colonies of the Americas and the estate agriculture of colonial Southeast Asia, consolidated holdings and steep land inequality were common. Their consequences for long-run inequality and institutions are well documented ([Engerman and Sokoloff, 2002](#); [Banerjee and Iyer, 2005](#)). Smallholder-tenancy economies are the opposite case. Land was worked in small parcels by many tenants, so a reform that transferred ownership need not have changed the parcels at all. Which case applies to a given reform is an empirical question about pre-reform holdings. Ownership rosters cannot answer this question, because they record how much land an owner held and do not show which parcels were adjacent.

South Korea had a smallholder-tenancy economy. Colonial Korea's countryside was organized around tenancy. Landlords made up under 4 percent of farm households and owned more than half of all farmland, and over 80 percent of farm households rented some or all of the land they worked ([Jang, 1995](#); [Kim et al., 1989](#)). The 1950 land reform changed ownership quickly and on a large scale. It dismantled this system between liberation in 1945 and the Korean War through three channels. Farmland confiscated from Japanese owners after 1945 went to cultivators, mostly from 1948. The Farmland Reform Act of 1949–50 transferred tenanted Korean-owned land to the tillers. Owners could retain up to 3 hectares<sup>2</sup> of self-cultivated land.

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<sup>1</sup>[Besley and Burgess \(2000\)](#) across Indian states; [Banerjee et al. \(2002\)](#) on West Bengal's tenancy reform; [Montero \(2022\)](#) on El Salvador's ownership-ceiling reform; [Adamopoulos and Restuccia \(2020\)](#) on the Philippines; [Chari et al. \(2021\)](#) on China's land-rights reforms; [Takayama et al. \(2022\)](#) on Japan's parallel 1947 reform.

<sup>2</sup>The statutory ceiling was 3 chŏngbo, the customary Korean land unit; 1 chŏngbo = 0.992 hectare. We report areas in hectares throughout, converting and rounding where the difference matters.

Many landlords sold land privately before the state could act, because they expected redistribution. Farmland under tenancy fell from 65 percent at the end of 1945 to 8 percent by 1951 (Kim et al., 1989). The reform moved the ownership of land on a massive scale within a few years, and it did so through legally distinct channels. Only some of those channels leave a trace in the plot-level records we use.

This paper studies a land reform at the level of the individual plot. We link four sources for Gian-ri, a village on the southern edge of Suwon, South Korea. The colonial land-tax ledger (地稅名寄帳) records each plot's owner, assessed rental value, and recorded ownership transfers through 1949–50. The modern cadastral register provides official land values for 1984–95 and land-use histories. Lot numbers on the 1915 cadastral map connect the historical records to GIS and to geocoded business-license microdata with issuance dates for 2000–19. We digitize every parcel polygon on the 1915 cadastral map. We georeference the 1918 topographic sheets and hand-digitize their road network. We take machine-detected 1918 house and paddy locations from the same sheets (Yang et al., 2026). These steps place every mapped historical record and every geocoded modern license on one map. The linked panel covers 318 plots, of which 303 have an identified Korean owner at the end of 1945 (88 distinct owners). Nine more plots belong to the vested group, and six cannot be classified. We classify plots into three groups by their 1945 owner. The first group is plots held by small Korean owners below the reform's 3-hectare retention ceiling ( $n = 201$ ). The second is plots held by large Korean owners at or above the ceiling ( $n = 102$ ). The third is plots held by Japanese corporate or individual owners, which we classify as the vested group from seller identity and post-1945 transfer timing<sup>3</sup> ( $n = 9$ ).

Our principal finding concerns pre-reform spatial structure. The fragmentation premise does not apply to the village we study, because its large owners' holdings were already dispersed and did not form consolidated estates. Ownership redistribution therefore need not have broken up contiguous estates, although we do not observe every subsequent change in parcel boundaries. The six large owners held their land as dispersed parcels mixed with small-owner plots. The mean same-owner contiguous block is 1.32 parcels for large owners and 1.26 for small owners.<sup>4</sup>

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<sup>3</sup>“Vested farmland” (歸屬農地) is the statutory term for former Japanese-owned assets, seized by the U.S. military government after 1945 and transferred to the Korean state in 1948; we shorten it to “vested” throughout.

<sup>4</sup>Blocks are computed in GIS from the digitized 1915 cadastral polygons: two parcels belong to the same block if they had the same 1945 owner and their polygons touch (within 0.5 m, to absorb digitization slack). Block size

Only 28 of the 296 pairs of bordering owner-known plots had the same owner on both sides. The largest owner's 36 plots form no block larger than three. Even under a deliberately consolidation-favoring assignment of the parcels outside the fragmentation sample, the largest owner's biggest contiguous block reaches only 11 parcels, against 33 that he is recorded as holding on the map (Section 3.1). Whether a reform fragmented holdings is a spatial question. The answer depends on which parcels touch, and not on how much land an owner held. Ownership lists cannot answer this question, but digitized cadastral polygons can.

Complementary descriptive comparisons relate 1945 owner class to later outcomes. Official values grow roughly six-fold in all three groups between the mid-1980s and mid-1990s. Conditional on initial land type and pre-reform assessed value, the large-owner coefficient is 0.006 (standard error 0.026). This coefficient is a small estimated difference in official assessments and is not a test of whether redistribution had an effect. Estimates for licensed-business presence and farm-to-building conversion are also close to their respective nulls, but their intervals allow economically meaningful differences.

The intervening records help describe the transition but do not identify its mechanism. Six of the 102 large-owner plots have recorded transfers in 1948–49. We cannot infer the disposition of the other 96 from the absence of a ledger entry. Modern ownership histories contain 33 preservation entries dated June 30, 1965, but they also contain later entries and have limited early coverage. We therefore do not infer universal title convergence by 1969, or the absence of short-run reform effects, from the later comparisons.

The groups do appear to differ on one further margin, the intensity of recorded license issuances. Land held by small ledger owners records about three times as many issuances per unit area as land held by large ledger owners. We report this comparison as exploratory and do not treat it as a finding. Eighty percent of the 241 plots in the license estimation sample record no issuance, and a single high-activity parcel carries 42 percent of all issuances in the estimation sample. The gap is statistically imprecise and roughly halves when we remove that parcel.

The analysis is descriptive. No experiment assigned ownership in 1945. The 102 large-owner plots belong to six landowners, so formal inference must operate at the level of owners. Under

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is the number of parcels so connected; a parcel with no same-owner neighbor is a block of one.

owner-level inference, the baseline group gaps are not statistically significant at conventional levels. One amenity-adjusted count specification is the exception (Section 3.4). We therefore make no causal claims. We establish the mapped spatial structure of pre-reform holdings and document later owner-class comparisons. The data do not identify the mechanisms linking these periods.

The paper contributes to three bodies of literature. The first is the empirical literature on land reform. Its unit of measurement is the state or district ([Besley and Burgess, 2000](#)), the program area ([Banerjee et al., 2002](#)), or the farm household ([Adamopoulos and Restuccia, 2020](#); [Chari et al., 2021](#)). [Montero \(2022\)](#) is the closest earlier study in design, but its unit is still the estate and its question is still the organizational form. We follow each mapped parcel through and beyond the reform. The contribution has two parts. The first is the data: a century-long, plot-level linkage of colonial fiscal records, modern administrative registers, license microdata, and GIS. The second is the finding that a spatial reconstruction can test, at the parcel level, the assumption that land reform fragmented consolidated holdings. Aggregate data cannot test that assumption. Our later-outcome comparisons are descriptive and local. We do not claim that they establish what land reform did to parcels in general. Our data cannot answer whether a parcel's documented reform path affected how it could subsequently be transacted. This question connects to the titling literature, where formal title matters through labor allocation, mobility, and alienability rather than investment alone ([Field, 2007](#); [Galiani and Schargrodsky, 2010](#); [de Janvry et al., 2015](#)).

The second is work on fragmentation, consolidation, and parcel geometry ([Adamopoulos and Restuccia, 2014](#); [Foster and Rosenzweig, 2022](#); [Blarel et al., 1992](#); on scattering as a choice, [McCloskey, 1976](#)). Land reforms can be fragmentation events. Restitution, for example, measurably fragmented ownership across Central and Eastern Europe ([Hartvigsen, 2014](#)). Whether a particular reform was a fragmentation event is an empirical question about pre-reform holdings. In Gian-ri, the mapped pre-reform holdings were already scattered. Our setting is the opposite of the configuration studied in the property-rights and transaction-costs literature ([Libecap and Lueck, 2011](#); [Brooks and Lutz, 2016](#); [Yamasaki et al., 2023](#)). In Tokyo, the breakup of elite holdings left large lots, and their size shaped later development. In Gian-ri, we observe the

mapped pre-reform geometry directly, and the terms of ownership are a possible channel for future investigation.

The third is work on land at the level of the individual parcel, much of it outside economics. This work treats the cadastral map as a historical source ([Kain and Baigent, 1992](#)) and modern parcel records as land-use evidence. Fine-scale historical economics has followed *people* through record linkage ([Bleakley and Ferrie, 2016](#); [Abramitzky et al., 2021](#)). The land itself is rarely the linked unit. We show that colonial fiscal documents, cadastral registers, and modern license microdata can be joined at the parcel across a century. We document the linkage rates and the pitfalls involved.

Section 2 describes the setting and data, including intermediate registration histories. Section 3 presents the spatial finding and complementary long-run comparisons. Section 4 interprets them, and Section 5 concludes.

## 2 Setting and Data

### 2.1 The dissolution of colonial landlordism, 1945–1950

Tenancy dominated colonial Korean agriculture. Landlords owned more than half of all farmland, and over 80 percent of farm households rented at least some of the land they cultivated ([Jang, 1995](#); [Kim et al., 1989](#)). The system was dismantled between liberation and the Korean War through three channels. Japanese-owned farmland was confiscated after liberation and distributed to cultivators, mostly from 1948. In our ledger, the transfers of formerly Japanese-owned plots are dated 1946–49 (Appendix A.1). The 1949–50 Farmland Reform Act transferred tenanted land and imposed a three-hectare ceiling on owner-cultivated holdings. Landlords also sold land privately in anticipation of the Act ([Kim et al., 1989](#); [Lee, 2021](#)). Tenanted land fell from 65 percent at the end of 1945 to 8 percent by 1951.

These institutional details chiefly inform our classification of plots. We compare plots held in 1945 by Korean owners whose ledger-recorded farmland holdings were below or at least three hectares. This comparison does not identify whether a plot was subsequently retained, privately sold, or distributed under the Act. Nine Japanese-owned plots form a small vested group that we

report descriptively and document in Appendix [A.1](#).

## 2.2 The village and the sample

Our setting is Gian-ri (now Gian-dong), a village in Hwaseong on the southern fringe of Suwon, roughly 40 km south of central Seoul (Figure 1). Over the outcome window, the village shifts from rice and dry-field farming to peri-urban development. In this setting, land values appreciate and businesses enter, so frictions on land use matter most. The 1915 cadastral map of the village contains 485 parcels. Our analysis sample consists of the 318 plots we can link between the colonial tax ledger and the modern cadastral register, as described below. Of these plots, 303 have an identified Korean 1945 owner.

This project builds on the ledger transcribed for our companion study ([Park and Yang, 2026](#)). That study’s archive search (April 25, 2026) identified 188 distinct digitized land-tax ledger volumes, 133 from former Suwon County, six of them from Anryong township. It selected one Anryong volume, CJD0004566, whose surviving label identifies Gian-ri. The other volumes contained substantial corporate and institutional holdings. The companion study expected them to contribute less to its private-sales analysis relative to their transcription cost. We undertook no additional village screening for this parcel-linkage project. These counts cover digitized volumes, not all surviving ledgers or fully linkable villages. We selected Gian-ri because we had already transcribed its ledger and its records linked well, not because it is representative. Gian-ri’s peri-urban setting further limits extrapolation to agricultural regions.

## 2.3 Data collection and preparation

We assembled the dataset from four sources. These are a colonial tax ledger, the modern cadastral register, the 1915 cadastral map, and modern business-license microdata.

### 2.3.1 The colonial land-tax ledger (地稅名寄帳)

Our main historical source is a land-tax ledger for Anryong township, which contained Gian-ri. The colonial administration used the ledger to record who owed land tax on each plot. The ledger survives at the National Archives of Korea (item CJD0004566). Internal evidence dates

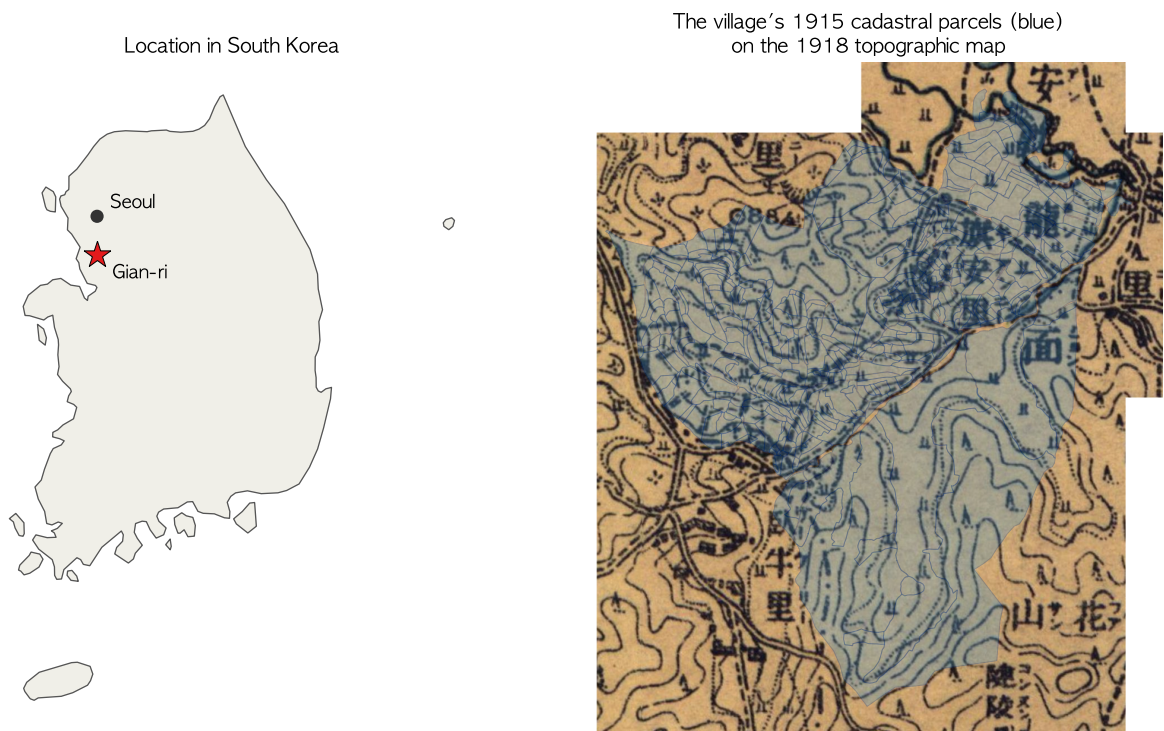


**Figure 1:** Location of Gian-ri. The left panel shows South Korea, with Seoul and the village marked. The village lies about 40 km south of Seoul, on Suwon's southern fringe. The right panel shows the village's 1915 cadastral parcels (blue) over the georeferenced 1918 topographic map sheets. This panel shows the paper's setting as it looked at the start of the sample period.

its compilation to 1942–43, with entries updated through 1949–50 (Park and Yang, 2026). Although the ledger lacks registry (登記) status, Korean courts have treated it as evidence of factual landholding. In places, the farmland survey slips (農地小票), the reform's own working documents, were compiled from it (Cho, 2011). These uses make the ledger suitable for studying the reform's plot-level incidence.

The ledger records each plot's characteristics and ownership history. For every plot, it records the address, land category (dry field, paddy, building land), and taxed area in pyeong (1 pyeong = 3.3 m<sup>2</sup>). It also records the statutory rental value (in yen), which the colonial state assessed as the tax base. We use this value as a measure of initial land quality. The ledger lists the owner of record and every recorded ownership change through the late 1940s, with year, month, day, seller, and buyer. We transcribed the ledger in full and coded each plot's ownership spells and up to two transfers.

We identify owners with a roster built from the ledger's owner pages. The roster records each owner's name and address, which distinguishes resident from absentee owners.

We total year-end 1945 farmland holdings across all ledger plots for each identified 1945 owner. These holdings include dry field and paddy, measured in pyeong and converted to hectares. We identify a Korean 1945 owner for 303 of the 318 sample plots (88 distinct Korean owners). Nine further plots had Japanese owners (the vested group), and six plots are unclassified (Appendix A.1).

### 2.3.2 The modern cadastral register (土地臺帳)

The modern source is the current cadastral register. A professional data-entry firm scanned and typed the register pages for all sample plots in three rounds. The pages provide two kinds of content. Grading pages record each plot's official land grade by year, with consistent coverage for 1984–95, the window we use. History pages contain dated land-category, area, and subdivision/merger entries. A separate ownership sheet contains dated ownership and administrative events. These surviving histories are not necessarily complete records from the reform onward.

We convert land grades (an integer scale, 1–300) to values in KRW/m<sup>2</sup> using the statutory land-grade value table (土地等級價額表). The National Tax Service of the Republic of Korea documents this table (National Tax Service, Republic of Korea, 1995). It maps each integer grade to a value per unit area. We apply the corresponding values and effective dates to yearly observations over 1984–95. Where a year's grade is unrecorded, we carry forward the previous year's grade (1985–95 only). We leave 1984 as recorded because the pre-1984 grading system is not comparable. Official grade-based values are assessment values, not transaction prices. We use them as a within-village panel of relative values, for which the statutory schedule's monotone mapping is sufficient.

A plot that is subdivided or merged ceases to be the same observational unit. We set its land value and land category to missing from the year after its first registered subdivision or merger. This exclusion is mild. Of the 309 classified plots with a 1984 value, 293 remain by 1995. The controlled value regressions use the 240 Korean-owner plots that also carry a 1945 assessment. Attrition is balanced across ownership groups (Appendix Table A.1).

### **2.3.3 Intermediate evidence from ownership histories**

We link the ownership sheets to all 318 sample parcels and remove repeated entries with identical parcel ID, date, and event code. The resulting 1,424 entries include 70 ownership-preservation entries (code 2) on 70 parcels and 945 ownership-transfer entries (code 3). Codes 4 and 5 denote address and name changes, respectively, and do not indicate transfers. Code 3 does not distinguish sale from inheritance or other transfer causes.

The surviving entries document the timing of preservation entries and the incidence of recorded transfers. Appendix Figure [A.1](#) reports annual counts. Of the 70 preservation entries, 33 are dated June 30, 1965, six precede 1965, and 31 follow 1969. The shared date may reflect batch administrative recording. We do not interpret it as 33 independently dated resolutions of title frictions or attribute it to a particular act. Appendix Table [A.12](#) separates the owner groups. Recorded transfers during 1960–83 occur on 150 of 201 small-owner parcels (74.6 percent) and 73 of 102 large-owner parcels (71.6 percent). These shares measure parcels with surviving entries and are not comparable exposure-adjusted hazards. Neither the presence nor the absence of an entry identifies a parcel’s reform disposition.

These records have substantial coverage limits. Only 23 ownership events predate 1960. The first surviving event is not necessarily the first registration, and the absence of a preservation entry does not mean the land was unregistered. The separate land-use history begins in 1985 for 283 of the 318 parcels, so it cannot support a representative 1950s–70s land-use panel. These records cover part of the chronological gap but do not measure early productivity, investment, or title security. They do not establish that all titles had converged by 1969 or that short-run reform effects were absent.

### **2.3.4 The 1915 cadastral map and record linkage**

The spatial base is the 1915 cadastral map, which we digitized into 485 parcel polygons. We georeferenced and reprojected the polygons to the Korean national grid, EPSG:5179. The map’s lot number (地番) is the key that links all the sources.

We digitized the map in-house using historical images and a modern cadastral shapefile. We collected scanned images of the 1915 Gian-ri cadastral map from the National Archives of Korea

and obtained the modern shapefile for the same area. Many parcel boundaries have persisted, allowing us to use coinciding lot boundaries across the 1915 and modern maps as control points. We georeferenced the historical images with these points. With the 1915 coordinates fixed, we edited the modern shapefile to match the historical map. We traced each 1915 parcel to produce the 485-polygon layer used here.

We completed three manual linkage tasks and documented each in a matching workbook. We matched tax-ledger plots to modern register plots by address and area. The ledger and register use successor addresses of the same lots. This match defines the 318-plot sample. We then matched register plots to their unique modern cadastral identifiers and matched the 1915 map lot numbers to tax-ledger plots.

We graded match quality by the agreement between map polygon area and taxed area. The areas agree within 1% for 170 plots, between 1% and 3% for 56, and between 3% and 5% for 6. A further 33 plots carry a merged-link grade, indicating that a 1915 lot spans a merged register situation. In 24 of these, two register plots share a lot number (12 such lot numbers). We count each shared lot number once in any per-area calculation. We flag 5 plots as uncertain and could not link 48 to the map. In total, 53 of the 318 rows have no map lot number, so we exclude them from GIS-based analysis.

### **2.3.5 Business-establishment licenses**

Modern business outcomes come from administrative business-license records. Municipal officials enter these records in the city/county/district Saeol administrative system. LOCAL-DATA, the national Local Administrative Licensing Data Open System, releases the records (<https://localdata.go.kr>). They comprise all records released for the covered licensing regimes and years, but do not necessarily cover all establishments. For Gian-dong/Gian-ri, the village's successor administrative units, the extract contains 1,089 license records. Each record contains the license type, establishment name, address, and license issue date.

We recovered coordinates for 1,081 records in a tiered procedure and retained the source of every coordinate. Most records contain original register coordinates. We geocoded the other records from their lot-number or road-name addresses using reference address databases. We

matched the exact lot, its parent lot, or the road address, in that order. We could place ten records no more precisely than the neighborhood centroid. We then spatially joined each point to the 1915 parcel polygons and attached the historical lot number.

We restrict the records to those we can locate within the historical cadastral boundary more precisely than the neighborhood centroid. Of the 1,089 license records, 1,081 have recoverable coordinates and eight do not. We exclude 69 outside the boundary and ten located only at the neighborhood centroid, leaving 1,002 records. Of these, 279 fall on the 318 linked sample plots and 723 on other parcels inside the boundary. These mutually exclusive categories (8, 69, 10, 279, and 723) account for all 1,089 records.

We define the outcome at the *unique 1915 map lot* (地番). Each 1915 lot is one observation. We assign every license geocoded to that lot to the same observation, including licenses on its later subdivisions, as with lot 338. We count each license once, regardless of the number of record–plot links. The 279 sample records form 296 record–plot links because 17 records fall on the 12 lots that link to two register plots. Where a 1915 lot links to two register plots, the deterministic larger-ledger-area rule selects the plot-level covariates and owner. We use the 1915 polygon area as the area measure. The 241 Korean-owner lots with a 1945 assessment form the main estimation sample. Section 3.4 reports a robustness result that drops the 12 shared lots.

The business outcome measures license issuance during 2000–19. We restrict the window because earlier database coverage is sparse and COVID-19 affects 2020. Appendix Table A.2 lists the 60 license types in the window with their Korean names, English translations, and record counts (903 mapped records dated 2000–19). An issuance need not represent a new firm because relocations, replacements, and re-registrations can generate new records. We therefore interpret the outcome as recorded license activity, not firm births.

### 2.3.6 Auxiliary geographic layers

Two further predetermined geographic layers enter the analysis as controls. We hand-digitized the road network from the georeferenced 1918 map sheets, producing 14 segments totaling 13.4 km. The sheets' legend distinguishes two classes, a second-class road (drawn as a double line) and the connecting-road network (a solid plus a dashed line). Figure 2 overlays the digitized lines

on the sheets. We also use house and paddy locations detected on the same 1918 sheets by the object-detection pipeline of [Yang et al. \(2026\)](#). These locations give each plot a predetermined measure of settlement proximity. Section 3.2 describes how these layers enter the regressions. The controls include counts of nearby detected settlement and paddy symbols, road distances, and a touches-a-road indicator.

Digitized 1918 roads and detected houses and rice paddies  
over the 1918 map sheets

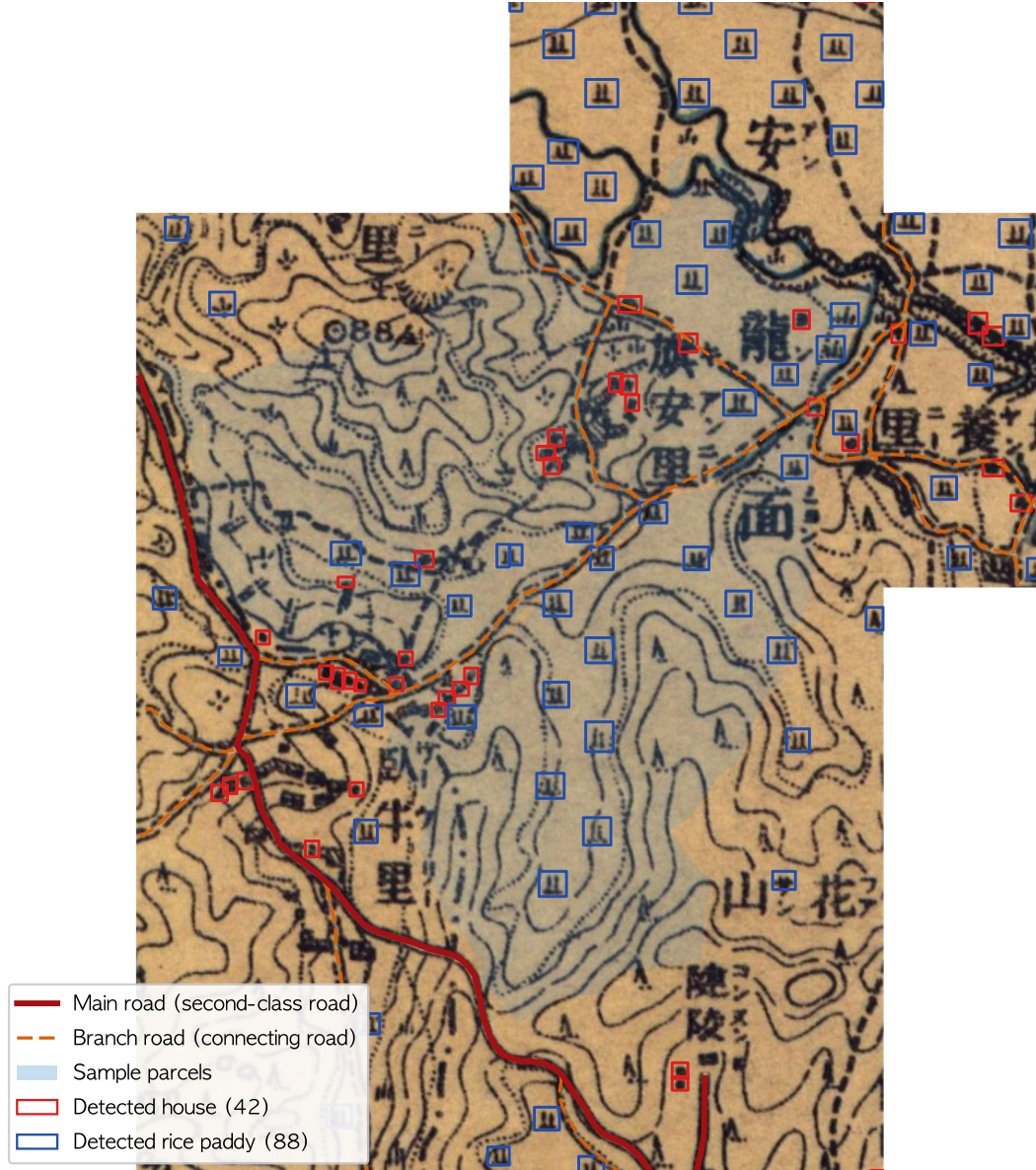


**Figure 2:** The 1918 road network. We hand-digitized the lines from the georeferenced map sheets and classified them by the sheets' legend. The main road is a second-class road, drawn as a double line on the original. The connecting-road network is drawn as a solid plus a dashed line. Pale blue shading marks sample parcels. Unfilled red and blue boxes outline the houses and rice-paddy symbols detected on the same sheets by the object-detection pipeline. These lines and boxes provide the predetermined road-access and settlement-proximity controls defined in Section 3.2.

### 2.3.7 Assigning plots to ownership groups

We classify plots by their 1945 owner.

- **Small owner** ( $n = 201$ ). The 1945 owner held less than 3 hectares of farmland in the ledger. This threshold does not identify cultivation status or subsequent reform disposition.
- **Large owner** ( $n = 102$ ). The owner held 3 hectares or more in the ledger. This classification measures ownership and does not identify observed statutory treatment. These 102 plots belong to only six owners. Five of these owners belong to two kinship groups, the Yoon clan of Gian-ri itself and the Park clan of neighboring Wau-ri. One further Wau-ri owner (owner #54; created surname 牧原) belongs to neither clan.<sup>5</sup>
- **Vested (Japanese)** ( $n = 9$ ). These plots had a Japanese corporation or individual as their 1945 owner. Seller identity and post-1945 transfer timing identify the inferred vested group. We exclude this small, separate group from the small-versus-large comparison. Appendix A.1 describes how we identify it from the ledger.

Table 1 quantifies the distinction between the ownership classification and observed transfers. Six of the 102 large-owner parcels have a recorded transfer in 1948–49 (five in 1948, one in 1949). We can also link five of these parcels to the cadastral map. These entries document a pre-reform transfer channel and do not establish statutory redistribution. The other 96 parcels have no recorded post-1945 ledger transfer. We cannot classify them as retained or redistributed, and unrecorded private transfers remain possible. The companion study analyzes sales in the broader ledger and does not provide a complete statutory-disposition roster for these 102 parcels (Park and Yang, 2026). The observed transfer share therefore does not estimate the share that escaped statutory redistribution.

Figure 3 shows that the three ownership groups are spatially mixed throughout the village. The vested plots are scattered among Korean-owned plots. These patterns relate to the contiguity results in Section 3.1 and the appendix shape tables.

The small- and large-owner groups differ modestly on pre-reform observables. Normalized

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<sup>5</sup>Under Sōshi-kaimei (創氏改名), the 1940 Japanese colonial ordinance, each Korean household was required to register a new Japanese-style family name (氏). This name was registered at the household level, not the clan level. We assume that members of the same Korean clan (本貫) tended to coordinate and adopt the same family name, but this cannot be verified with available data.

### Ownership groups (1945 owner class)

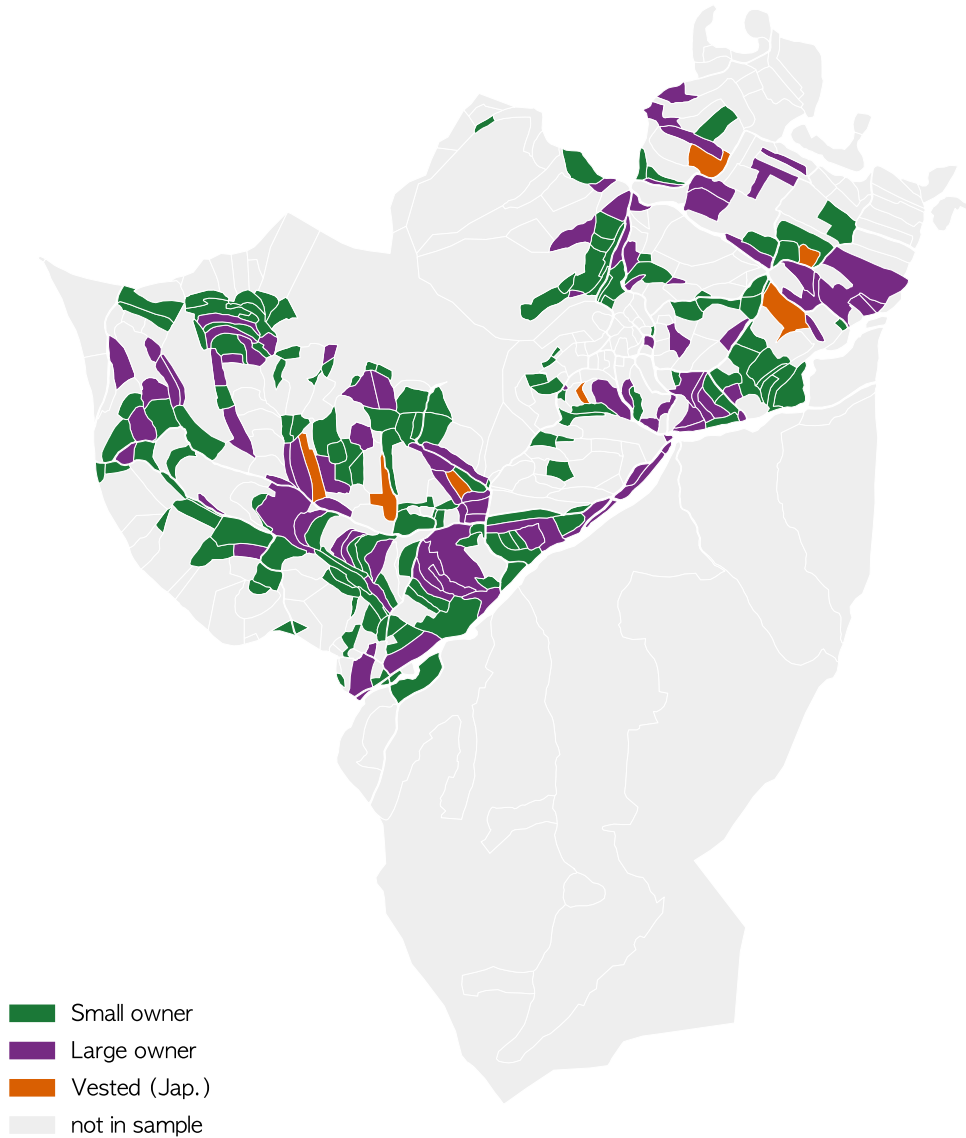


**Figure 3:** Spatial distribution of the three ownership groups on the 1915 cadastral map. Small-owner (green), large-owner (purple), and vested (orange) plots are mixed throughout the village. Light-gray parcels are outside the mapped, classified sample.

differences are 0.20–0.28 on area, initial rental value per pyeong, and land type, and  $-0.12$  on distance to a 1918 road (Table 2). The baseline regressions condition on land category and the 1945 assessed rental value, and the amenity specifications add 1918 road and settlement measures. Large owners held relatively more paddy, which the analysis conditions on throughout. Large owners' plots also more often lie within 15 m of a 1918 road (34 vs. 17 percent). As Section 3.4 shows, this road-access advantage cannot explain their lower issuance intensity.

**Table 1:** Observed pre-reform transfers among large-owner parcels

| Ledger evidence for the 102 large-owner parcels | Parcels | Percent |
|-------------------------------------------------|---------|---------|
| Recorded transfer in 1948–49                    | 6       | 5.9     |
| No recorded post-1945 transfer                  | 96      | 94.1    |
| Total                                           | 102     | 100.0   |

The denominator is all 102 parcels held by large ledger owners at the end of 1945, including the six with recorded subsequent transfers. The absence of a recorded transfer is not evidence of retention. We cannot classify parcels by statutory redistribution or retention. The nine vested-group parcels are separate.

We report descriptive contrasts without significance stars because the large-owner contrast rests on only six large Korean owners. Formal inference must operate at the owner level, and we defer it to the regression stage.

**Table 2:** Pre-reform characteristics by group

| Group             | Plots | Owners | Area m <sup>2</sup><br>(GIS) | 1915 category (%) |       |       | Rental/pyeong<br>(1945 yen) | Paddy %<br>(1945) | Road<br>dist. m | Touches<br>road % |
|-------------------|-------|--------|------------------------------|-------------------|-------|-------|-----------------------------|-------------------|-----------------|-------------------|
|                   |       |        |                              | Dry               | Paddy | Bldg. |                             |                   |                 |                   |
| Small owner       | 201   | 82     | 1,586                        | 55                | 33    | 4     | 0.051                       | 43                | 162             | 17                |
| Large owner       | 102   | 6      | 2,010                        | 45                | 52    | 3     | 0.056                       | 53                | 146             | 34                |
| Norm. diff. (L–S) |       |        | 0.28                         |                   |       |       | 0.21                        | 0.20              | –0.12           | 0.38              |

We define groups by the 1945 owner’s total ledger farmland. A small owner held less than 3 hectares, which approximates the reform’s 3-chŏngbo retention ceiling (2.98 hectares). A large owner held at least 3 hectares of farmland in the ledger. Rental value is per pyeong, a customary Korean area unit (1 pyeong = 3.3 m<sup>2</sup>). The normalized difference is the large-minus-small mean gap divided by the pooled standard deviation. Parcel areas come from the digitized 1915 cadastral polygons. The 1915 category columns show dry field, paddy, and building land only. We omit other categories, so the shares need not sum to 100. The 1915 shares are computed among plots with a recorded 1915 category (163 small-owner and 98 large-owner plots, including eight small-owner plots whose 1915 category is recorded although they lack a usable map lot number); the 1945 paddy share is computed among all plots in the group. Touches road: the parcel polygon lies within 15 m of a 1918 road.

### 3 Empirical Results

The principal result is the spatial reconstruction of pre-reform holdings (Section 3.1). The later owner-class comparisons provide complementary descriptive evidence. Assessed-value estimates are small, while several commercial and land-use contrasts are imprecise. The license-intensity comparison is also sensitive to one parcel.

### 3.1 The principal finding: mapped holdings were already scattered

The consolidated-estate image implies that a landlord's plots form contiguous blocks. We test this by computing the size of the same-owner contiguous block for every sample plot with a known 1945 owner. We treat two parcels as neighbors when their 1915 polygons touch, allowing a 0.5 m buffer, and we group connected parcels that share a 1945 owner.

Landownership, year-end 1945: each large owner's plots are scattered

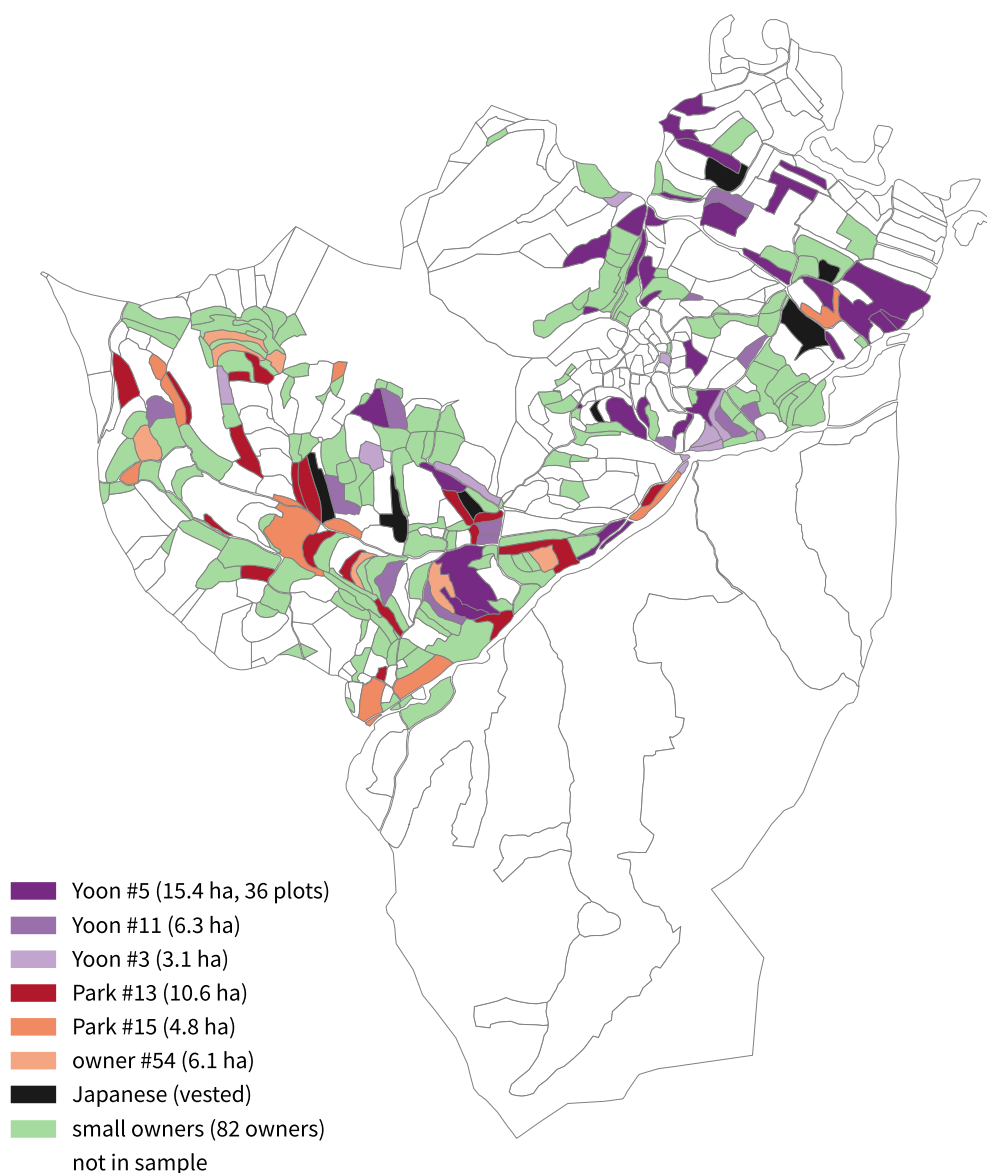


**Figure 4:** Landownership at year-end 1945. Each of the six large owners is colored individually (Yoon clan in purples, Park clan in reds, owner #54 in orange). Japanese (vested) plots are black, and small-owner plots are light green. Every large owner's holdings are scattered across the village and mixed with small-owner land.

### 1945 same-owner contiguous blocks (sample plots)

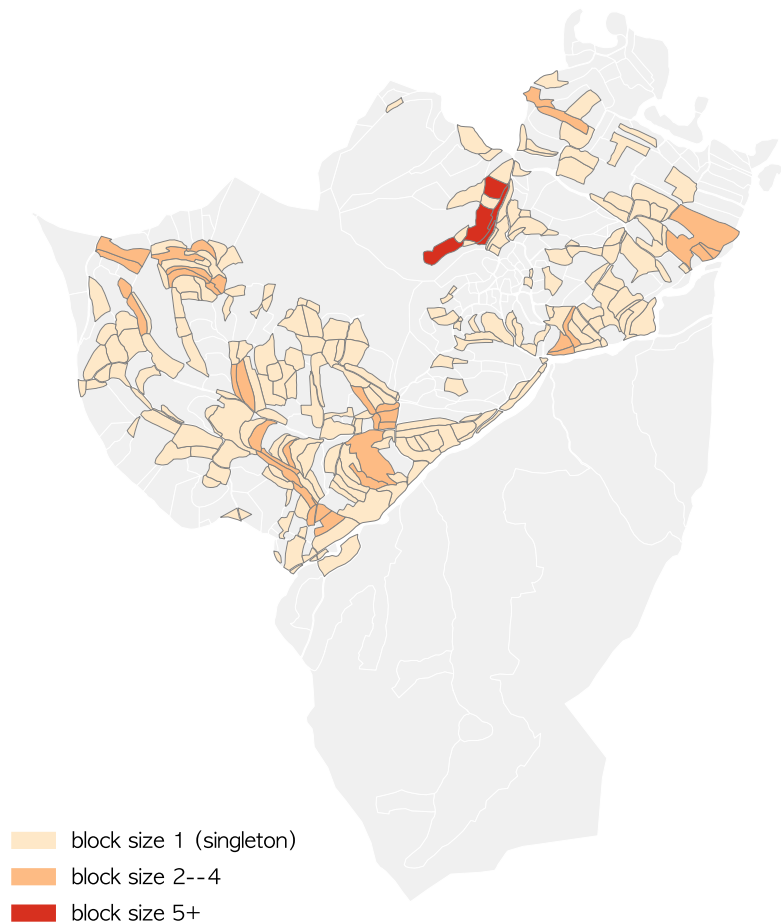


**Figure 5:** 1945 same-owner contiguous blocks among sample plots. Nearly all plots are singletons. Multi-plot blocks (darker) are rare and small.

The mapped sample is inconsistent with highly consolidated holdings (Figure 4). Each large owner's plots, individually colored, are dispersed across the village and mixed with small-owner land. The mean block is 1.32 plots for large owners and 1.26 for small owners. The largest large-owner block contains three plots. Plot borders also show dispersion. Of the 296 pairs of owner-known sample plots that share a border, only 28 had the same owner on both sides in 1945. For roughly nine out of ten borders, the land on the other side belonged to someone else. A large owner's plot would typically border his own land if large owners held consolidated estates. Owner #5 is the largest owner, with 36 plots and 15.4 hectares.<sup>6</sup> His parcels are scattered across the entire village (Figures 4 and 5). This pattern fits owners who bought single plots over

<sup>6</sup>The ledger records 36 sample plots for owner #5; 33 distinct polygons are drawable on the maps (three plots lack a map lot number or share one).

time. It does not fit owners who built up one estate. However, the ledger does not record how the parcels were acquired or cultivated.

Incomplete linkage limits what the mapped sample can show. The fragmentation sample contains the 248 map parcels that link to the ledger and carry a classified 1945 owner group (146 small-owner, 95 large-owner, and 7 vested). These parcels are part of the 485 on the 1915 sheet. The other 237 parcels on the sheet, mostly unlinked, are larger on average (median 2,512 vs. 1,514 m<sup>2</sup>), consistent with forest, roads, and commons outside the tenancy system. Unlinked neighbors could in principle share an owner. We therefore consider an adversarial scenario that attaches every parcel outside the fragmentation sample to its most frequent adjacent observed owner. This assignment maximizes local same-owner adjacency, but it is not a proven bound. Even under this assignment, same-owner pairs rise only from 28 of 296 adjacent pairs (9 percent) among owner-known parcels to 393 of 993 (40 percent). The latter comparison includes these parcels and their borders. The largest large-owner contiguous block grows from 3 to 11 parcels, compared with 33 mapped parcels recorded for the largest owner. This remains far from a single estate and requires assigning him unlinked land for which no ownership evidence exists. The observed large-owner parcels are highly dispersed and remain far from a consolidated estate even under this deliberately consolidation-favoring assignment. We do not claim to have proven an absence of consolidation across the whole village (Appendix Table [A.3](#)).

In this village, the reform therefore had few large blocks of land to break up. The owners differed in identity, wealth, and legal position, but their plots did not differ in physical structure. The mapped parcels are balanced on geometry across the ownership groups. Measured lot structure therefore offers little basis for explaining later differences, subject to the caveat in Section 3.2. In [Yamasaki et al. \(2023\)](#), the 1868 dissolution of elite holdings released abnormally large lots whose size persisted and shaped Tokyo's development for 150 years. In Gian-ri, the elite holdings were ordinary scattered parcels. This makes the setting useful for descriptive work, although it does not by itself provide a causal design.

## 3.2 Specification and controls

Group comparisons in the results below summarize conditional means and do not identify causal parameters. We use descriptive OLS regressions when conditioning on covariates. For land values, we estimate

$$\ln V_{it} = \alpha_{g(i)} + \delta_t + X_i' \gamma + \varepsilon_{it}, \quad (1)$$

where  $V_{it}$  is the official assessed value per m<sup>2</sup> of plot  $i$  in year  $t$  (1984–95). The terms  $\delta_t$  are year dummies, and  $g(i)$  indexes the 1945 ownership group. The vector  $X_i$  contains 1915 land-category indicators and the log of the plot’s 1945 assessed rental value. This colonial tax assessment serves as our standard predetermined-quality control. We use the 1915 land category from the cadastral map throughout the value and license regressions. The conversion hazard conditions on the 1984 register category instead. We use the 1945 category from the tax ledger only descriptively. The 1915 and 1945 land categories agree for all but a handful of plots.

A third specification adds the 1918 amenity layers from Section 2.3.6. For each plot, we measure the centroid distance to the nearest digitized 1918 road and to the nearest main road. We include an indicator for whether the parcel polygon lies within 15 m of a road (“touches a road”). We also include the number of machine-detected 1918 houses and rice-paddy symbols within 200 m. Official values rise roughly six-fold over 1984–95 in every group. The year dummies absorb this common appreciation, and the group coefficient compares plots within a year. They do not correct for the changing composition of the panel as subdivided plots leave. The balanced-panel check in Appendix Table A.8 addresses that. The nine vested plots lack the 1945 assessment and drop from regressions that control for it, but they appear descriptively. The rate-based OLS for license issuances replaces the outcome with issuances per 1,000 m<sup>2</sup> of 1915 parcel area and drops the year dummies. Section 3.4 describes the count model and the linear probability model.

We cluster standard errors by 1945 owner throughout. The village has 88 identified 1945 owners. The mapped, covariate-complete estimation sample contains 70 of them, including six large owners. The main estimation samples and the wild bootstrap use these 70 owners. The 1995 cross-section in Appendix Table A.6 has 67 owner clusters. With only six large-owner

clusters, we focus on magnitudes rather than significance levels and do not report significance stars.

Parcel geometry was fixed before the reform. The 1910s cadaster fixed parcel shape decades before the reform. We compute rectangularity, compactness, elongation, and convexity from the digitized 1915 polygons and illustrate them in Figure 6. The 1945 same-owner block structure also predates the reform. Both parcel shape and block structure are balanced across the ownership groups (Appendix Tables A.4 and A.5). Neither rectangularity nor elongation has a detectable association with land value or license issuances (Appendix Table A.6), and issuance rates do not rise consistently with 1945 block size (Appendix Table A.4). Together with the scattered pre-reform holdings in Section 3.1, these results limit support for fragmentation and demarcation explanations in the observed sample (Libecap and Lueck, 2011; Brooks and Lutz, 2016). Still, we cannot rule out that parcel shape mattered in ways we do not measure.

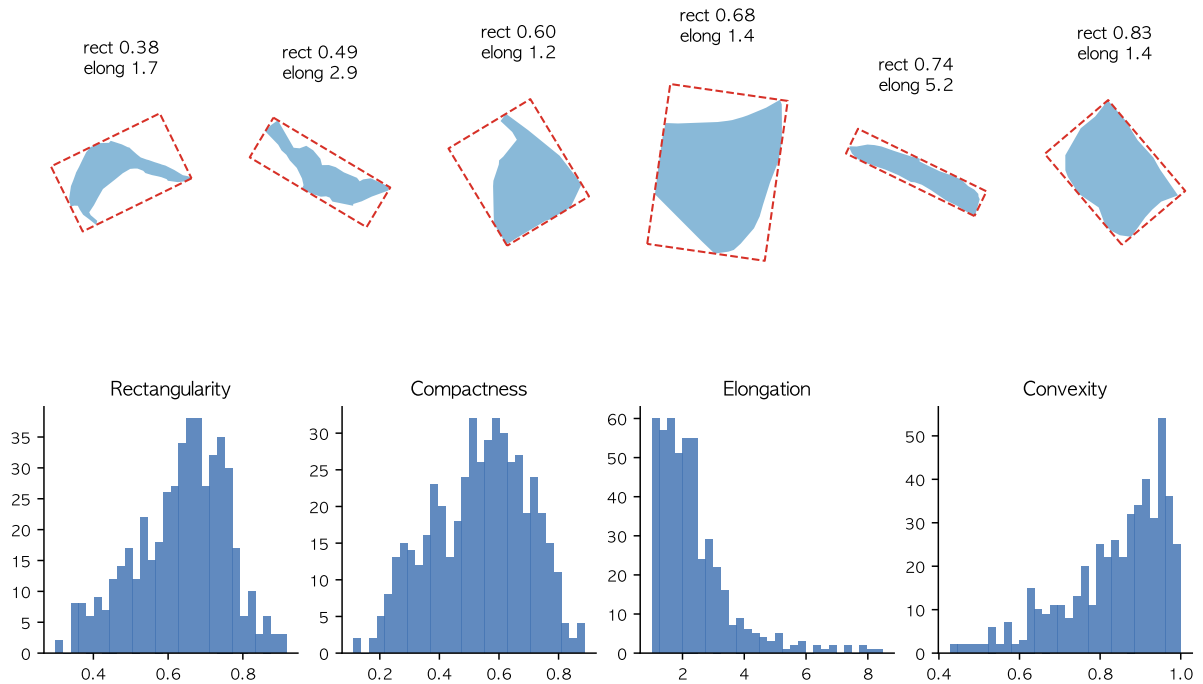


**Figure 6:** The shape metrics illustrated on sample parcels, with village-wide distributions.

The village was not selected at random, and the linked sample is not a complete census of parcels in Gian-ri. Clustered standard errors are conventional measures of regression uncertainty. They do not correct for village selection or incomplete linkage. With only six large-owner clusters, even a narrow interval needs caution. When we cannot reject zero, this does not show

that the two groups are the same.

We classify a plot as large-owner when its identified 1945 owner's total farmland recorded in the ledger reaches three hectares. This ledger-observed holding is not a verified statutory total. Absentee owners in particular may hold land outside the ledger's area. We therefore interpret the variable as ledger owner class, not statutory eligibility. Six of the 70 owners in the estimation sample meet the threshold and separate clearly from the rest. The 90th percentile of owner holdings is 2.65 hectares, while the six large owners hold 3.1 to 15.4 hectares. The estimated coefficient changes little with the exact cutoff, although the number of large-owner plots does. The issuance-rate coefficients are  $-0.36$ ,  $-0.33$ , and  $-0.31$  at thresholds of 2.5, 3.0, and 3.5 hectares. The coefficient is  $-0.37$  when we drop owners within half a hectare of the ceiling (Appendix Table A.7). We therefore describe the contrast as an association with 1945 ledger owner class. We reserve terms such as “distributed,” “reform-target,” or “reform exposure” for plots whose statutory path is documented. The main analysis does not observe this path.

### **3.3 Complementary evidence: later outcomes by 1945 owner class**

We describe later assessed values, licensed-business presence, and land-use conversion by 1945 owner class. These comparisons do not identify reform effects, and their precision differs across outcomes.

Official assessed values are a natural first outcome because they may reflect the discounted income that land is expected to yield in its best use. That use may be paddy, dry field, or building land. A lasting difference in productivity or permitted use would tend to appear in a plot's assessed value, whatever the channel. Official assessed values are not transaction prices. They do, however, grade every plot on a common scale in every year, as the comparison requires.

Official land values grow roughly six-fold between the 1984–86 and 1993–95 sub-period means in every group as the village urbanizes. The raw gap narrows from about 5 percent below small-owner land in 1984–86 to about 3 percent in 1993–95. The composition adjustment in the right panel of Figure 7 shrinks this gap. Table 3 shows the gap as we add controls. The raw large-owner coefficient is about  $-5$  percent (column 1). With land-type and pre-reform assessed-value controls, it is  $+0.6$  percent (column 2). It is  $+1.7$  percent (standard error 1.5

**Table 3:** Log land value, 1984–95: OLS estimates

| Dependent variable: log official land value (KRW/m <sup>2</sup> ), plot-year panel 1984–95 |        |         |       |         |       |         |
|--------------------------------------------------------------------------------------------|--------|---------|-------|---------|-------|---------|
|                                                                                            | (1)    |         | (2)   |         | (3)   |         |
| Large owner                                                                                | −0.049 | (0.037) | 0.006 | (0.026) | 0.017 | (0.015) |
| 1915 land-category dummies                                                                 | –      |         | Yes   |         | Yes   |         |
| Log 1945 assessed rental value                                                             | –      |         | Yes   |         | Yes   |         |
| 1918 amenities (roads, settlement)                                                         | –      |         | –     |         | Yes   |         |
| Year dummies                                                                               | Yes    |         | Yes   |         | Yes   |         |
| Plot-year observations                                                                     |        |         | 2,808 |         |       |         |
| Plots                                                                                      |        |         | 240   |         |       |         |

OLS estimates with log official land value (KRW/m<sup>2</sup>) as the dependent variable. The plot-year panel covers 1984–95, with year dummies in every column. Small owners are the omitted group. We cluster standard errors by 1945 owner and omit significance stars. See the inference note in Section 3.2.

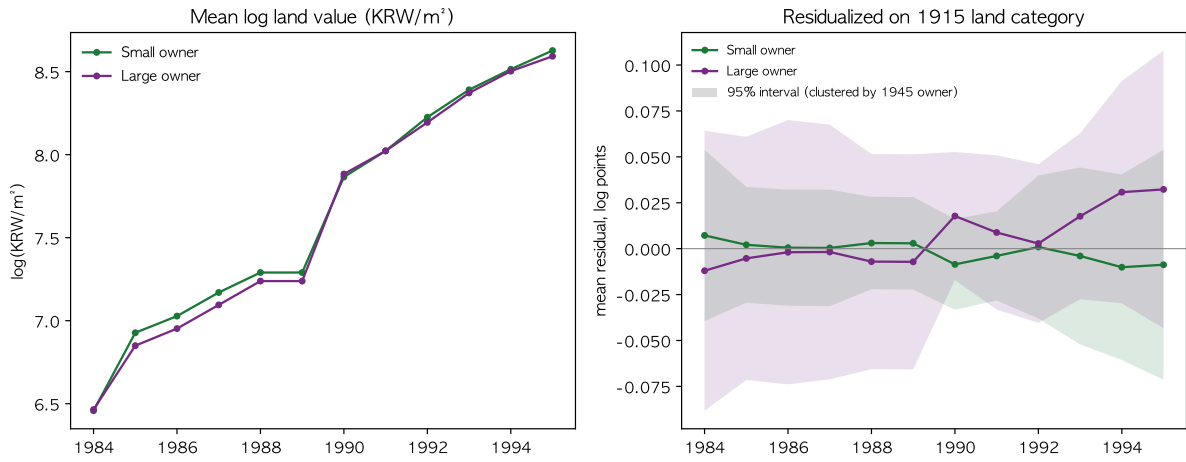


**Figure 7:** Land-value trajectories of the two Korean ownership groups, 1984–95. The left panel shows mean log value. The right panel shows mean residuals from a regression of log value on 1915 land-category dummies, with shaded 95 percent confidence bands around each group mean. Standard errors are clustered by 1945 owner. The bands overlap in every year.

percent) under the 1918 amenity layers (column 3). Large owners held more paddy, which appreciated less on the urban fringe. The adjusted coefficient is 0.006 (se 0.026). Its approximate conventional 95 percent interval is  $[-0.045, 0.057]$  log points, or about  $-4.4$  to  $+5.9$  percent. These calculations describe uncertainty under the reported owner-clustered specification. With only six large owners, they should not be read as proof of equivalence. They concern official assessments, not unobserved transaction prices.

The small point estimate is not specific to the grade–value mapping. Official values are integer land grades mapped through a statutory schedule. When a year is unrecorded, we carry forward the previous year’s grade, affecting 24 percent of the plot-year panel. Re-running the com-

parison on raw grades gives similarly small estimates with and without carry-forward (+0.0004, se 0.004, and  $-0.0003$ , se 0.003, on log grade). A within-year percentile rank of the grade also gives a small estimate ( $-0.001$ , se 0.019). So does a balanced panel of plots with a value in all twelve years (+0.008, se 0.026). Estimates are similarly small for each half of the period separately and for the 1984 and 1995 cross-sections taken alone (Appendix Table A.8). Grades change in most recorded years and take 8 to 31 distinct values within a given year. The comparison therefore does not rely on an unchanging grade measure.

The license and land-use outcomes concern commercialization. Land reform is usually evaluated within agriculture through productivity, investment, and farm incomes. Gian-ri lies on the urban fringe of a large city, and over the sample window much of its land moved out of farming. Its license records run from a handful dated before 2000 to 903 mapped issuances over 2000–19. On a single plot, the move from agriculture to services (Herrendorf et al., 2014) shows up as a change of use, for example when a paddy field becomes a shop or a restaurant. The license register records each issuance with its location and date. A growing literature uses this type of data to study where service firms locate (Humphreys and Matti, 2023).

Estimates on the land-use margin are uncertain. Registered land categories barely change through 1995 in every group. Post-1995 conversion to building land tracks the license margin rather than ownership history. By 2023, 49 percent of plots with at least one recorded issuance had converted to building land, against 24 percent of plots with none. We detect no difference in the two owner groups’ conversion hazards (Figure 8), though the interval is wide. A discrete-time hazard model for farm-to-building conversion uses a year baseline over 1985–2023, with standard errors clustered by 1945 owner. It gives a large-owner hazard ratio of 0.96 ([0.54, 1.69]; Appendix Table A.9). The groups’ register-category shares in 1984 differ because large owners held more paddy, but these shares change little through 1995 (Appendix Table A.10).

### 3.4 An exploratory result: the intensity of license issuances

The estimated owner-class contrast in recorded business-license intensity is large but uncertain and sensitive to a single parcel. A license issuance can mark a relocation, re-registration, or replacement as much as a genuinely new establishment. We therefore interpret the outcome as

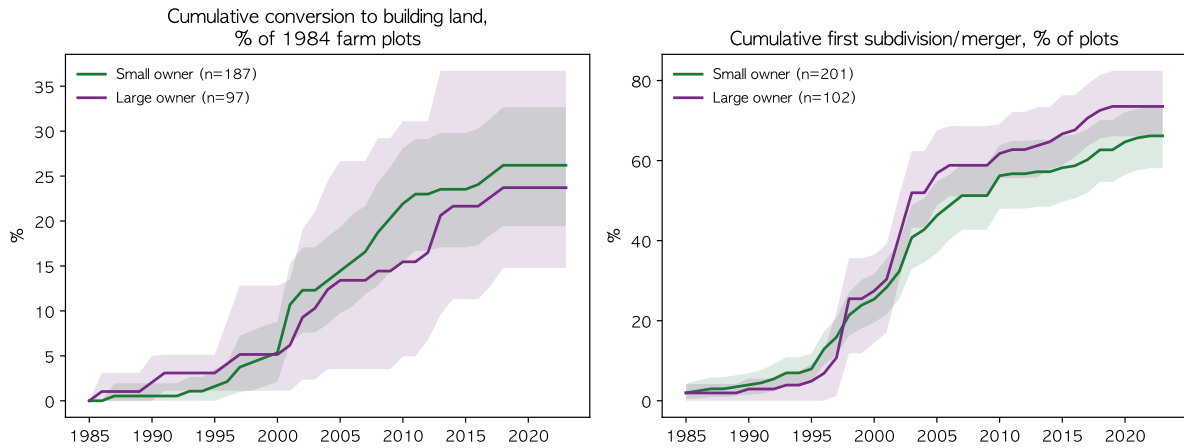


**Figure 8:** Land-use dynamics of the two Korean ownership groups, 1985–2023. The left panel shows cumulative conversion of 1984 farm plots to building land. The right panel shows first subdivision or merger. Shaded bands are pointwise 95 percent intervals from a cluster bootstrap over the 1945 owners. They overlap in every year on both margins. Overlap does not establish equivalence. The owner-class conversion hazard ratio is 0.96 with a 95 percent interval of  $[0.54, 1.69]$ .

the density of recorded license issuances over 2000–19, not as entry into the nonfarm economy.<sup>7</sup>

The extensive margin measures whether a plot records at least one license issuance over the window. A linear probability model gives a large-owner coefficient of  $+0.012$  (se 0.037) against a base of 0.20. The reported 95 percent interval is  $[-0.06, 0.09]$ , allowing differences of several percentage points in either direction. The count model below addresses issuance intensity, which need not follow the same pattern.

Small-owner land records 0.82 issuances per 1,000 m<sup>2</sup> over the window (total issuances over total area), compared with 0.25 for large-owner land. This roughly three-fold gap appears in nearly every year (Figure 9) and within initial land type (dry fields: 1.11 vs. 0.43; paddy: 0.42 vs. 0.12). Unlike the land-value gap, this gap is not explained by differences in land type, and it remains after the standard controls. However, it shrinks by about half when we remove one high-activity plot.

We use a count model as our primary specification because the outcome is a sparse integer count. In the estimation sample of 241 plots, 80 percent record no issuance, and a single parcel carries 42 percent of all issuances. We estimate Poisson pseudo-maximum likelihood with

<sup>7</sup>The license register’s coverage effectively begins in 2000: only 13 of 1,002 mapped records have issuance dates before 2000 (the earliest in 1981), which suggests a surviving remnant rather than complete historical coverage. We therefore use 2000–19 issuances as the outcome and do not analyze the timing of a plot’s first issuance, which incomplete pre-2000 coverage makes unreliable.

1915 parcel area as exposure. Table 4 reports this model for the full sample and excluding lot 338, alongside the extensive-margin linear probability model. The large-owner coefficient is  $-0.99$  (95% CI  $[-2.11, 0.13]$ ; a rate ratio of 0.37) in the full sample. It is  $-0.41$  ( $[-1.33, 0.50]$ ) without lot 338. The extensive margin is  $+0.01$  ( $[-0.06, 0.09]$ ) in the full sample and  $+0.02$  ( $[-0.06, 0.09]$ ) without lot 338. The rate-based OLS is a linear approximation ( $-0.33$ , se 0.245, in the full-sample row of Table 5), against a plot-level small-owner mean rate of 0.68. The base-line estimates are not statistically significant at conventional levels. The amenity-adjusted count model is the exception ( $-0.86$ ,  $[-1.64, -0.09]$ ; Table 4). With six large-owner clusters and sensitivity to lot 338, we do not treat it as confirmatory. These estimates describe an association with 1945 owner class and should not be read as causal effects. We omit significance stars for the reasons given in Section 3.2.

Figure 9 shows the same gap year by year, using the format of Figure 7’s right panel. We plot annual issuances per 1,000 m<sup>2</sup>, residualized on 1915 land category. Each group has a mean line and a shaded 95 percent band from owner-clustered standard errors. The small-owner line stays above the large-owner line in nearly every year, and the bands overlap in nearly every year. The gap is large and stable but not statistically significant.

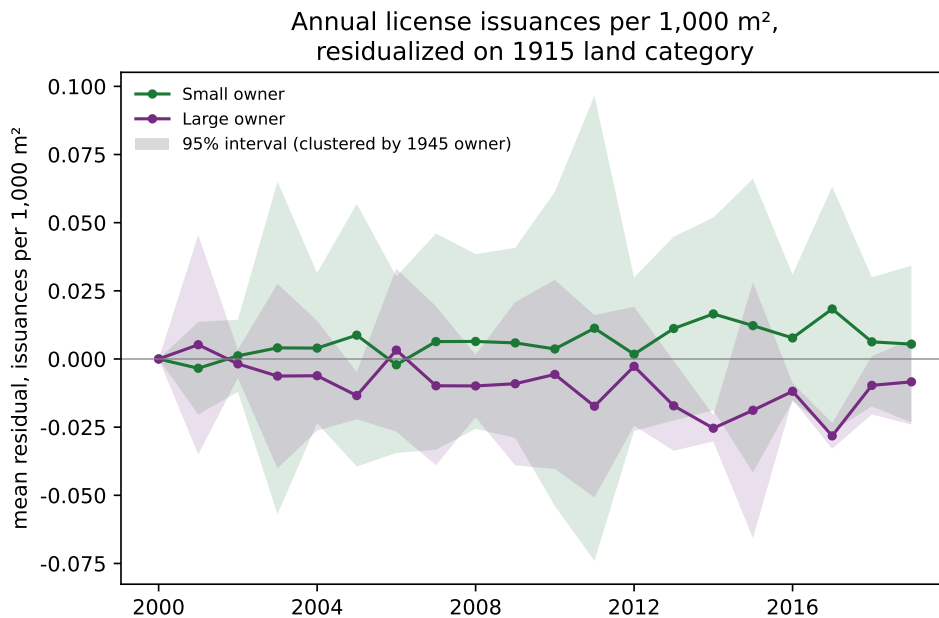


**Figure 9:** Annual license issuances per 1,000 m<sup>2</sup> by group, 2000–19, residualized on 1915 land category. Shaded areas are 95 percent confidence bands around each group mean, with standard errors clustered by 1945 owner. The construction follows the right panel of Figure 7.

**Table 4:** Business-license issuances, 2000–19: count model and extensive margin

|                                                             | Large-owner coef. | 95% CI         |
|-------------------------------------------------------------|-------------------|----------------|
| <i>Count model: PPML, 1915 area as exposure (issuances)</i> |                   |                |
| Full sample                                                 | −0.99             | [−2.11, +0.13] |
| Excluding lot 338                                           | −0.41             | [−1.33, +0.50] |
| Full sample, + 1918 amenities                               | −0.86             | [−1.64, −0.09] |
| <i>Extensive margin: LPM, at least one issuance</i>         |                   |                |
| Full sample                                                 | +0.01             | [−0.06, +0.09] |
| Excluding lot 338                                           | +0.02             | [−0.06, +0.09] |
| Mean issuances per plot (small / large)                     | 1.4 / 0.5         |                |
| Plots (full / excluding lot 338)                            | 241 / 240         |                |

Poisson pseudo-maximum likelihood with 1915 parcel area as exposure (log area as offset; issuance count). We also estimate a linear probability model for whether a plot records at least one issuance over 2000–19. The table reports the coefficient on the large-ledger-owner indicator with a 95 percent confidence interval. We include 1915 land-category dummies and log 1945 assessed value throughout and cluster standard errors by 1945 owner. Lot 338 is one small-owner parcel carrying 106 of the 204 small-owner issuances. The rate-based OLS (Table 5) is a linear approximation.

The comparison is sensitive to a single plot and rests on few large owners. A single small-owner plot carries 106 of the 204 small-owner issuances. Dropping it roughly halves the estimate in both models (rate OLS  $-0.33 \rightarrow -0.15$ ; PPML  $-0.99 \rightarrow -0.41$ ; Tables 4 and 5). The comparison rests on six large owners. Leaving each out in turn moves the OLS coefficient over  $[-0.44, -0.24]$  and the PPML coefficient over  $[-1.40, -0.75]$  (Table 5). A wild cluster bootstrap on the owner clusters, imposing the null, gives  $p = 0.22$ . Dropping the 12 lots that link to two register plots leaves the PPML coefficient at  $-1.06$  (se 0.63; 229 lots). The intensity gap is therefore large but imprecise and depends heavily on one plot. The extensive-margin interval also permits meaningful differences. The PPML interval  $[-2.11, 0.13]$  corresponds to an issuance-rate ratio of approximately  $[0.12, 1.14]$ , allowing a large negative association as well as no difference. Appendix Table A.11 reports OLS, LPM, and Poisson estimates for the 248 mapped parcels, including vested plots and without the 1945 assessed-value control. We avoid  $\log(1 + Y)$  outcomes because their magnitudes are unit-dependent (Chen and Roth, 2024).

Amenities and predetermined quality do not explain the gap. The baseline rate-based OLS specification already holds constant the colonial state’s assessed rental value of each plot. The state set this ledger value to reflect land quality and location, and it was, if anything, marginally higher on large-owner land. Adding a quadratic in plot coordinates and distance to the 1918

**Table 5:** License-issuance robustness: model, influence, and few-cluster inference

| Specification                                  | Large-owner coef.                                                                   | (cluster se) | Note                 |
|------------------------------------------------|-------------------------------------------------------------------------------------|--------------|----------------------|
| Rate OLS, per 1,000 m <sup>2</sup> (full)      | −0.331                                                                              | (0.245)      | linear approximation |
| Rate OLS, per 1,000 m <sup>2</sup> (excl. 338) | −0.147                                                                              | (0.159)      |                      |
| PPML, unique 1915-lot (drop shared)            | −1.055                                                                              | (0.631)      | 229 lots             |
| Leave-one-large-owner-out (rate OLS / PPML)    | range [−0.44, −0.24] / [−1.40, −0.75] over the six large owners                     |              |                      |
| Wild cluster bootstrap $p$ (rate OLS)          | 0.22; Rademacher weights on the 70 owner clusters, null imposed, 1,999 replications |              |                      |
| Issuance count distribution                    | 192 zeros (80%); median 0; p99 11; max 106; top plot = 42% of all issuances         |              |                      |

Korean-owner plots with a 1945 assessment ( $n = 241$ ). PPML denotes Poisson pseudo-maximum likelihood with 1915 area as exposure (log area as offset). We cluster standard errors on the 1945 owner. The leave-one-out row drops each of the six large owners in turn. The wild cluster bootstrap imposes the null with Rademacher weights on the owner clusters.

settlement center<sup>8</sup> leaves the gap at  $-0.32$  (se 0.23). The groups are balanced on distance to this settlement center (large  $+0.03$  km, se 0.04). They are also balanced on distance to the nearest 1918 road in the network we digitized from the sheets (Figure 2). The one imbalance works against an amenity explanation. We find that 34 percent of large-owner plots lie within 15 m of a 1918 road, against 17 percent of small-owner plots (Table 2). The amenity specification in Table 4 adds the full set of layers defined in Section 3.2. However, 1918 roads only partially anticipate where modern commerce grew. We deliberately omit contemporaneous road access as a control because it is endogenous to commercialization.

## 4 Discussion

### 4.1 Interpreting the descriptive comparisons

Our main contribution is the spatial result that the mapped holdings were already dispersed before the reform. The later comparisons establish a narrower descriptive fact. Under the reported controls, 1945 owner class has a small estimated association with official assessments in 1984–95. We estimate commercial and conversion outcomes less precisely. Owner class does not reveal reform disposition. These comparisons therefore cannot distinguish limited persistence of pre-reform ownership differences from a weak correspondence between owner class and actual redistribution.

Three historical considerations may help interpret the results. Our data cannot test them.

<sup>8</sup>The settlement center is the density-weighted center of the 1918 houses detected on the map sheets (Yang et al., 2026), each weighted by the number of other houses within 250 m, so it locates where houses were dense rather than the geometric middle of the parcels.

First, a land-to-the-tiller program could change ownership without changing existing cultivation units. Our companion study documents pre-reform transfers, often among existing owners and relatives ([Park and Yang, 2026](#)). The six recorded transfers in Table 1 show that this alternative channel is present within our large-owner sample. Neither those entries nor the spatial maps identify cultivation, investment, or household responses. Effects operating through farm organization and people, as in [Adamopoulos and Restuccia \(2020\)](#) and [Chari et al. \(2021\)](#), may coexist with the parcel comparisons reported here.

Second, national milestones do not establish a common date of clear title for every village parcel. The historical literature describes redemption restrictions, special registration measures from 1965 onward, and the administrative closure of the reform in 1969 ([Kim et al., 1989](#); [Cho, 2011](#)). The preservation entries in our data cluster in 1965, but 31 occur after 1969 and early histories are incomplete (Section 2.3.3). Preservation entries and broad transfer codes do not measure whether title was secure, marketable, or usable as collateral. We therefore do not claim that all parcels had clear title by 1969. Titling remains a plausible channel, consistent with the broader literature ([Field, 2007](#); [Galiani and Schargrodsky, 2010](#); [de Janvry et al., 2015](#)), but assessing it requires more complete registry evidence.

Third, peri-urban development may change what determines assessed land values. By our outcome windows, Gian-ri was on the expanding Seoul–Suwon fringe, where development potential could outweigh agricultural returns. This potential offers a possible explanation for the limited later association. It does not show that development erased reform effects. The available ownership events supply intermediate administrative evidence. The land-use histories mostly begin in 1985 and the consistent value series in 1984. We do not observe early productivity and investment responses. Later similarity cannot distinguish an absence of initial differences from their subsequent attenuation. A comparable reconstruction in a predominantly agricultural setting would help assess the scope of these descriptive patterns.

## 4.2 The intensity margin

The one measured difference concerns the intensity of recorded license issuances. In the full sample, small-owner land records roughly three times the issuances per unit area of large-owner

land. Some issuances accompany a sale, lease, conversion, or new building, and others reflect administrative changes at existing premises. Issuance density could therefore partly reflect a difference in how readily owners supply land for commercial use, alongside small adjusted differences in official assessments. Section 3.4 showed that this difference is fragile. Eighty percent of the 241 sample plots record no issuance. A single commercial parcel, lot 338, carries 42 percent of all issuances in the estimation sample. This parcel is a former small-owner field rebuilt as a multi-tenant commercial building. The gap roughly halves when we remove that parcel and is imprecise throughout. We therefore read the difference as a hypothesis about the supply of land for commercial use. Testing this hypothesis requires the registry histories of named owners, co-ownership, and separately identified inheritance and sale. The digitized event codes do not provide these histories.

Clan membership may also matter for this margin. The owners include members of the Yoon clan of Gian-ri and the Park clan of neighboring Wau-ri. In the full sample, license-issuance intensity on plots of small owners from these clans is closer to that on large-owner plots than to that on other small-owner plots. This pattern is fragile in the same way. It rests on lot 338 and fades when we remove that parcel. Social structure organized along kinship could persist through changes in ownership or use. Clan institutions shape economic outcomes in Korean villages (Yang, 2019). The registry histories could test whether lineage is associated with subsequent transactions. We do not settle that question here. In a very different market, Guo and Wang (2023) find that regional cultural differences are associated with merger-and-acquisition performance. Obtaining the registry records is the next stage of the project.

## 5 Conclusion

We reconstruct the mapped parcels of one Korean village across the land reform era. We show that large ledger owners held dispersed parcels rather than consolidated estates. This spatial result is our principal contribution. Aggregate holdings cannot reveal this structure, but linking owners to cadastral polygons can. This result concerns the mapped pre-reform configuration. It does not by itself establish the reform's effects on parcel boundaries or farm units.

The complementary long-run analysis compares 1945 owner classes. These classes do not

identify observed reform treatments. Adjusted assessed-value differences are small. Estimates for licensed-business presence and land-use conversion remain compatible with meaningful differences. The license-intensity contrast is large but imprecise and sensitive to one commercial parcel. None of these results establishes that redistribution had no effect.

The ownership records between 1945 and the 1980s are incomplete. Six of 102 large-owner parcels have recorded 1948–49 transfers, leaving most reform paths unclassified. Preservation entries cluster in 1965 but also occur later. Incomplete histories do not establish universal title clearance by 1969. Early economic responses may have occurred even where later owner-class contrasts are small.

We selected the case through an earlier ledger project, without additional village screening. Its peri-urban setting and six large owners limit generalization. Cadastral reconstruction can test whether redistribution operated on consolidated or already scattered holdings. The next step is to combine this reconstruction with documented reform paths and more complete intermediate histories, in order to assess how spatial structure and the terms of ownership shaped subsequent outcomes.

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## A Additional Figures and Tables

### A.1 Constructing the vested group

We identify the vested (Japanese) group from ledger transfers. Japanese sellers transferred nine plots in 1946–49. These sellers were the Oriental Development Company and Tozan, both dissolved at liberation, and one individual. We classify these transfers as distributions of vested land. A Japanese seller alone does not establish vested status. The ODC also made genuine wartime sales to Korean smallholders in 1943–44. These buyers are the recorded 1945 owners, and we classify them by their own holdings. The vested definition therefore requires a Japanese seller *and* a transfer year of 1946 or later. We exclude six further plots whose 1945 owner we cannot identify. The vested group lacks ledger-based initial conditions (rental value, 1945 land category). Baseline adjustments that include this group therefore use the 1915 map’s land category, which we observe for every mapped plot.

**Table A.1:** Plots with nonmissing land values (attrition from subdivision or merger)

| Group         | 1984 | 1987 | 1990 | 1993 | 1995 |
|---------------|------|------|------|------|------|
| Small owner   | 198  | 196  | 194  | 190  | 187  |
| Large owner   | 102  | 101  | 101  | 99   | 98   |
| Vested (Jap.) | 9    | 9    | 8    | 8    | 8    |

**Table A.2:** Business-license types: the 15 major types and the composition of the other category

| Panel A: the 15 major types (kept separately; $\geq 10$ records)      |                                   |     |                   |                                       |    |
|-----------------------------------------------------------------------|-----------------------------------|-----|-------------------|---------------------------------------|----|
| Type                                                                  | English                           | N   | Type              | English                               | N  |
| 일반음식점                                                                 | General restaurant                | 166 | 쓰레기종량제봉투판매업       | Volume-rate waste-bag sales           | 22 |
| 통신판매업                                                                 | Mail-order/online retail          | 152 | 집단급식소             | Institutional cafeteria               | 16 |
| 즉석판매제조가공업                                                             | On-site food preparation and sale | 115 | 식품제조가공업           | Food manufacturing                    | 14 |
| 담배소매업                                                                 | Tobacco retail                    | 51  | 청소년게임제공업          | Youth arcade                          | 13 |
| 미용업                                                                   | Beauty salon                      | 49  | 체육도장업             | Martial-arts gym                      | 11 |
| 축산판매업                                                                 | Meat retail                       | 36  | 의료기기판매 (임대) 업     | Medical-device sales/rental           | 11 |
| 휴게음식점                                                                 | Snack bar / café                  | 28  | 식품판매업 (기타)        | Food retail (other)                   | 10 |
| 건강기능식품일반판매업                                                           | Health-supplement retail          | 27  |                   |                                       |    |
| Panel B: components of the residual other category (<10 records each) |                                   |     |                   |                                       |    |
| 대기오염물질배출시설설치사업장                                                       | Air-pollutant-emitting facility   | 9   | 건물위생관리업           | Building sanitation services          | 3  |
| 국내여행업                                                                 | Domestic travel agency            | 9   | 동물판매업             | Pet sales                             | 3  |
| 축산가공업                                                                 | Livestock processing              | 8   | 방문판매업             | Door-to-door sales                    | 3  |
| 식품소분업                                                                 | Food repackaging                  | 8   | 병원                | Hospital                              | 3  |
| 의원                                                                    | Medical clinic                    | 8   | 체력단련장업            | Fitness center                        | 2  |
| 당구장업                                                                  | Billiard hall                     | 7   | 위탁급식영양업           | Contract catering                     | 2  |
| 식육포장처리업                                                               | Meat packing                      | 7   | 저수조청소업            | Water-tank cleaning                   | 2  |
| 이용업                                                                   | Barbershop                        | 7   | 식품자동판매기영업         | Food vending machines                 | 2  |
| 집단급식소식품판매업                                                            | Cafeteria food supply             | 7   | 목욕장업              | Bathhouse                             | 2  |
| 인터넷컴퓨터게임시설제공업                                                         | Internet café                     | 7   | 안경업               | Optician                              | 2  |
| 국외여행업                                                                 | Outbound travel agency            | 7   | 석유판매업             | Petroleum retail                      | 2  |
| 세탁업                                                                   | Laundry                           | 7   | 소독업               | Disinfection services                 | 2  |
| 약국                                                                    | Pharmacy                          | 6   | 민방위대피시설           | Civil-defense shelter                 | 2  |
| 출판사                                                                   | Publisher                         | 5   | 일반여행업             | General travel agency                 | 2  |
| 골프연습장업                                                                | Golf practice range               | 5   | 특정고압가스업           | Specialty high-pressure gas           | 2  |
| 유통전문판매업                                                               | Distribution-brand sales          | 5   | 일반게임제공업           | General arcade                        | 1  |
| 안전상비의약품판매업소                                                           | Over-the-counter medicine retail  | 5   | 식품운반업             | Food transport                        | 1  |
| 제과점영업                                                                 | Bakery                            | 5   | 단독정화조/오수처리시설설계시공업 | Septic/wastewater system installation | 1  |
| 옥외광고업                                                                 | Outdoor advertising               | 5   | 액화석유가스용품제조업체      | LPG equipment manufacturing           | 1  |
| 노래연습장업                                                                | Karaoke room                      | 4   | 지하수시공업체           | Groundwater drilling                  | 1  |
| 가축사육업                                                                 | Livestock raising                 | 4   | 유료직업소개소           | Employment agency                     | 1  |
| 고압가스업                                                                 | High-pressure gas                 | 3   | 유원시설업 (기타)        | Amusement facility (other)            | 1  |
| 인쇄사                                                                   | Print shop                        | 3   |                   |                                       |    |

**Table A.3:** Same-owner adjacency under alternative treatment of parcels outside the fragmentation sample

| Fragmentation measure              | Baseline<br>(owner-known parcels) | Adversarial scenario<br>(outside-sample parcels attached) |
|------------------------------------|-----------------------------------|-----------------------------------------------------------|
| Same-owner share of adjacent pairs | 9% (28/296)                       | 40% (393/993)                                             |
| Largest large-owner block (plots)  | 3                                 | 11                                                        |

Of the 485 parcels on the 1915 map, 248 link to the ledger and carry a classified 1945 owner group. This set forms the fragmentation sample. We compute the baseline on the 296 adjacent pairs among these parcels (28 same-owner). The adversarial scenario adds the 237 parcels outside this sample, most of them unlinked. We attach each to its most frequent adjacent observed owner to maximize measured consolidation. This scenario is not a proven bound. We compute it on all 993 adjacent pairs (393 same-owner). The block row reports the largest contiguous block held by a large owner. Table A.4 reports small-owner blocks.

**Table A.4:** 1945 same-owner contiguous blocks and license issuances

| Group         | Plots | Mean 1945<br>block size | In block<br>$\geq 5$ % | Issuances per 1,000 m <sup>2</sup> (N plots) by 1945 block size |           |          |
|---------------|-------|-------------------------|------------------------|-----------------------------------------------------------------|-----------|----------|
|               |       |                         |                        | 1 (singleton)                                                   | 2–4       | 5+       |
| Small owner   | 146   | 1.26                    | 3                      | 0.93 (126)                                                      | 0.19 (15) | 0.17 (5) |
| Large owner   | 95    | 1.32                    | 0                      | 0.17 (74)                                                       | 0.47 (21) | – (0)    |
| Vested (Jap.) | 7     | 1.00                    | 0                      | 0.15 (7)                                                        | – (0)     | – (0)    |

**Table A.5:** Parcel shape by group and by 1915 land category. Rectangularity =  $A/A_{\text{MABR}}$  (MABR: minimum-area bounding rectangle). Compactness =  $4\pi A/P^2$ . Elongation = long over short side of the minimum rotated bounding rectangle. Convexity =  $A/A_{\text{hull}}$ . Group rows cover the 248 sample parcels. Category rows cover all 1915 map parcels in the three categories shown.

|                | $N$ | Rectangularity | Compactness | Elongation | Convexity |
|----------------|-----|----------------|-------------|------------|-----------|
| Small owner    | 146 | 0.638          | 0.533       | 2.474      | 0.840     |
| Large owner    | 95  | 0.614          | 0.500       | 2.678      | 0.829     |
| Vested (Jap.)  | 7   | 0.616          | 0.501       | 2.236      | 0.796     |
| 1915 category: |     |                |             |            |           |
| Dry field      | 209 | 0.647          | 0.549       | 2.453      | 0.861     |
| Paddy          | 164 | 0.611          | 0.489       | 2.452      | 0.794     |
| Building       | 43  | 0.701          | 0.668       | 1.597      | 0.892     |

**Table A.6:** Shape metrics and outcomes (standardized coefficients)

|                    | OLS, log land value |               | Poisson, issuances |
|--------------------|---------------------|---------------|--------------------|
|                    | 1984                | 1995          | 2000–19            |
| Rectangularity (z) | 0.016 (0.015)       | 0.027 (0.023) | −0.010 (0.159)     |
| ln Elongation (z)  | −0.005 (0.017)      | 0.003 (0.024) | −0.085 (0.247)     |
| Large owner        | −0.016 (0.040)      | 0.024 (0.044) | −1.017 (0.573)     |
| $N$ (plots)        | 239                 | 229           | 241                |
| Owner clusters     | 70                  | 67            | 70                 |

All columns include 1915 land-category dummies; Poisson uses plot area as exposure; standard errors clustered by 1945 owner in parentheses. Korean-owner groups only.

**Table A.7:** Issuance-rate gap under alternative “large owner” thresholds

| Threshold for “large”   | Large-owner coef. | (cluster se) | Large plots |
|-------------------------|-------------------|--------------|-------------|
| $\geq 2.5$ ha           | −0.357            | (0.256)      | 108         |
| $\geq 3.0$ ha           | −0.331            | (0.245)      | 95          |
| $\geq 3.5$ ha           | −0.311            | (0.237)      | 84          |
| donut (drop 2.5–3.5 ha) | −0.371            | (0.266)      | 84          |

We regress issuances per 1,000 m<sup>2</sup> on a large-owner indicator defined at each threshold using OLS. We control for 1915 land-category dummies and log 1945 assessed value. We cluster standard errors on the 1945 owner. The donut row drops owners whose ledger holdings are within half a hectare of the three-hectare ceiling.

**Table A.8:** Assessed-value comparison: robustness to the grade–value mapping, carry-forward, and window

| Outcome / sample                        | Large-owner coef. | (cluster se) | Plots |
|-----------------------------------------|-------------------|--------------|-------|
| Mapped log value, carry-forward (paper) | +0.006            | (0.026)      | 240   |
| Log raw grade, carry-forward            | +0.0004           | (0.004)      | 239   |
| Log raw grade, no carry-forward         | −0.0003           | (0.003)      | 239   |
| Raw grade level, no carry-forward       | −0.004            | (0.430)      | 239   |
| Within-year grade percentile rank       | −0.001            | (0.019)      | 239   |
| Mapped log value, balanced panel        | +0.008            | (0.026)      | 228   |
| Log raw grade, 1984–89                  | −0.002            | (0.006)      | 239   |
| Log raw grade, 1990–95                  | +0.001            | (0.003)      | 239   |
| Log raw grade, 1984 only                | −0.004            | (0.008)      | 238   |
| Log raw grade, 1995 only                | −0.005            | (0.012)      | 118   |

The table reports the large-owner coefficient from the value regression in Section 3.3 under alternative outcomes and samples. We control for 1915 land-category dummies, log 1945 assessed value, and year fixed effects where applicable. We cluster standard errors on the 1945 owner. When a 1915 lot links to two register plots, we use the plot with the larger ledger area, as in Table 3. The first row therefore reproduces column (2) of that table. Raw grades are the register’s integer land grades before the statutory value mapping. The percentile rank is within-year and ordinal. Sample counts differ by design. The Korean-owner set with a 1945 assessment and a positive official value contains 240 plots. The 1995-only row contains 118 plots because it uses grades actually *recorded* in 1995. The rest are carry-forward fills. Point estimates remain small, but their precision varies across specifications. These checks do not establish equivalence.

**Table A.9:** Farm-to-building conversion: discrete-time hazard, 1985–2023

| Farm-to-building conversion, 1985–2023 | Coef.             | Hazard ratio [95% CI] |
|----------------------------------------|-------------------|-----------------------|
| Large ledger owner                     | −0.042 (se 0.289) | 0.96 [0.54, 1.69]     |
| Farm plots at risk / conversions       | 284 / 72          |                       |

We estimate a complementary log-log discrete-time hazard for the first conversion of a 1984 farm plot (dry field or paddy) to building land. We include a year baseline and a 1984-category control. We cluster standard errors on the 1945 owner. The large-ledger-owner hazard ratio gives no evidence of a difference, though the confidence interval is wide.

**Table A.10:** Land category shares by group, 1984 and 1995 (register categories).  $N$  counts plots with a recorded register category. It can differ from the counts in Appendix Table A.1, which require a land value.

| Group         | Year | $N$ | Dry % | Paddy % | Building % | Other % |
|---------------|------|-----|-------|---------|------------|---------|
| Small owner   | 1984 | 200 | 50    | 44      | 4          | 2       |
|               | 1995 | 187 | 49    | 45      | 4          | 2       |
| Large owner   | 1984 | 102 | 42    | 53      | 3          | 2       |
|               | 1995 | 98  | 40    | 54      | 4          | 2       |
| Vested (Jap.) | 1984 | 9   | 44    | 56      | 0          | 0       |
|               | 1995 | 8   | 38    | 62      | 0          | 0       |

**Table A.11:** Functional-form robustness for the license-issuance regressions

|                | OLS: issuances/1,000 m <sup>2</sup> |        | Poisson PML |        | LPM: any issuance |         |
|----------------|-------------------------------------|--------|-------------|--------|-------------------|---------|
| Large owner    | −0.33                               | (0.25) | −1.02       | (0.58) | 0.005             | (0.040) |
| Vested (Jap.)  | −0.34                               | (0.22) | −1.52       | (0.52) | 0.048             | (0.033) |
| Mean dep. var. | 0.52                                |        | 1.03        |        | 0.21              |         |
| Plots          |                                     |        | 248         |        |                   |         |

All columns: 1915 land-category dummies; SEs clustered by 1945 owner.

Poisson: 1915 area as exposure. LPM: log area as control. Omitted group: small owners.

## A.2 Intermediate ownership records

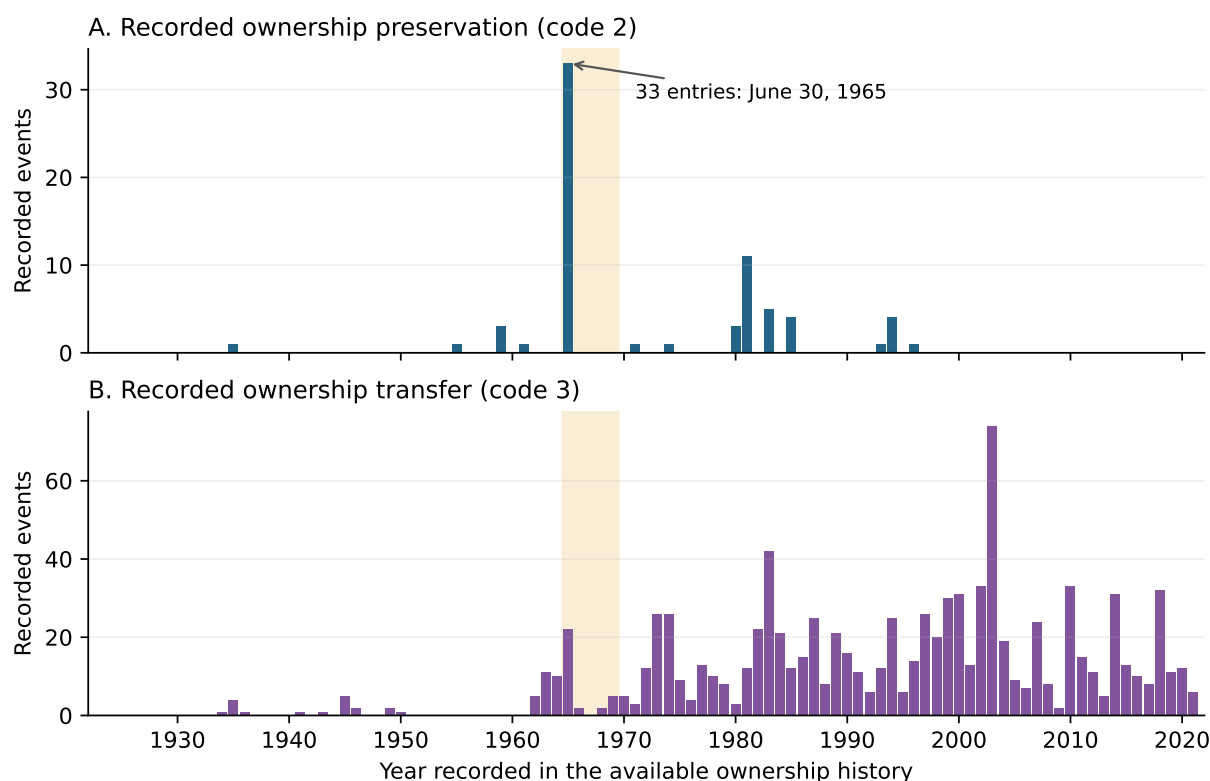


**Figure A.1:** Recorded ownership events on the 318 linked parcels. The shaded window is 1965–69. Code 2 denotes ownership preservation. Code 3 denotes ownership transfer without identifying its cause. All 33 preservation entries in the shaded window share June 30, 1965, as their recorded date. Counts describe surviving entries. They do not measure registration hazards or the number of parcels whose title frictions ended.

**Table A.12:** Intermediate registration evidence by 1945 owner class

|              | Parcels | With code 2<br>(all years) | Code 2<br>1965–69 | With code 3<br>1960–83 |
|--------------|---------|----------------------------|-------------------|------------------------|
| Small owner  | 201     | 42                         | 13                | 150                    |
| Large owner  | 102     | 26                         | 19                | 73                     |
| Vested       | 9       | 0                          | 0                 | 8                      |
| Unclassified | 6       | 2                          | 1                 | 2                      |
| All parcels  | 318     | 70                         | 33                | 233                    |

The last column counts distinct parcels with at least one recorded code-3 transfer during 1960–83, before the assessed-value window. Code 2 occurs once per parcel in these data. Rows include the six parcels without a classified 1945 owner. The absence of an entry is not evidence of no transfer or no registration. Codes 2 and 3 exclude address and name changes. We deduplicate entries using parcel ID, date, and event code. The 318 parcels have 1,424 dated entries of all types. Only 23 of these entries predate 1960.