

Peasant commune and the demand for land titling in Imperial Russia

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Abstract

Despite their potential economic benefits, land titling reforms around the world often encounters only moderate participation rates. Why do farmers hesitate to claim private land titles? To address this question, this paper examines the historical case of the 1906 land reform in the Russian Empire. For the first time in the country's history, the reform enabled peasants to obtain private titles to plots that had previously been held under communal tenure. Drawing on newly digitized commune-level data from the province of Simbirsk, the paper argues that the perceived benefits and costs of transitioning to private property were shaped by differences in the practice of land reallocation among the members of a commune, known as *repartitions*. I find that the reform was much less successful in communes where repartitioning had developed as a substitute for the land market. The results suggest that the design of land reforms must account for the incentive structures created by traditional property rights regimes.

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1 Introduction

Why have private property rights not been universally adopted? Much of the existing scholarship has highlighted the role of the state in the provision and enforcement of property rights (Firmin-Sellers, 1995; Onoma, 2009; Albertus, 2021). The supply of property rights, however does not appear to be a sufficient condition for their widespread adoption (Gans-Morse, 2017). Around the globe, land titling reforms implemented by the state have often encountered only limited popular uptake despite their potential economic benefits (Vendryes, 2014). Exploring the historical case of land titling reform in the late Russian Empire, this paper highlights the relative efficiency of informal institutions under local conditions as a key factor in shaping the benefits and costs of transitioning to private property.

With a land reform implemented in 1906, the Russian Empire enabled peasants, who constituted around 80% of its population, to acquire private titles on land for the first time in the country’s history. Recent research has documented that the reform succeeded in raising agricultural productivity (Dower and Markevich, 2018b) and promoting domestic migration (Chernina, Dower and Markevich, 2014). The demand for the reform, however, did not seem commensurate with the economic benefits of land titling, with only around 20% of peasant households titling their land by 1917 (Davydov, 2022).

Why did peasants in the Russian Empire hesitate to claim land titles? This paper argues that informal practices of land reallocation across households reduced the demand for formal titles by providing a viable alternative to market. In the Russian Empire, prior to the reform, peasant land had been owned collectively by the institution of the peasant commune (*obschina* or *mir*), which roughly corresponded to a village. Each commune allocated land plots within a communal field to individual households under temporary tenure and possessed the right to periodically reallocate — or *repartition* — land holdings. Claiming a formal title secured land from future repartitions, enabling peasants to collateralize or sell their plots. The reform therefore opened the door to land improvement, the emergence of a unified land market and better access to credit.

Taking advantage of newly digitized data on the universe of peasant communes in one province of the Russian Empire, this paper explores how incentive structures created by different repartitioning practices shaped the demand for formal land titling. In some communes, but not in others, repartitioning conditioned the size of an assigned land holding on the availability of family labor resources — in other words, more land was allocated to families with more workers.¹ Zooming in on a territory the size of present-day Slovakia enables me to hold constant the nation-wide formal institutions that regulated peasant landownership and focus instead on the local variation in the informal practice of land repartitioning. I find that the titling reform was substantially less successful in communes where repartitioning created a link between land and labor resources.

With no systematic commune-level data collected by the underbureaucratized imperial state (Kotsonis, 2016), the comprehensive study of the reform has faced considerable challenges. To characterize titling rates and repartitioning practices at a micro level, I digitized the agricultural census conducted in 1910–11 by the local government (*zemstvo*) of Simbirsk

¹The land tenure arrangement most similar to repartitioning in Russia existed in China after the abolition of the collective farming system in the early 1980s. Under that arrangement, a village had a right to reallocate land plots across families in response to demographic changes. Even though land reallocations were formally restricted in 1998, they seem to persist in some parts of China to this day (Ren et al., 2022).

province.² The census uniquely recorded the number of land plots titled under the reform of 1906 and the repartition rule adopted by a commune, along with the battery of socio-economic variables. To supplement the census data with geographical information, I manually geolocated the villages of Simbirsk province relying on historical maps. As a result, I end up with a cross-section of more than 2,500 communes in 153 townships (*volost'*) of eight districts (*uezd*) of the province.

Using these data, I first document substantial variation in repartitioning practices in Simbirsk province. Although the link between land and labor has long been treated as the defining feature of peasant landownership in Russia (for example, see [Scott, 1976](#)), I find that only about 40% of peasant communes in Simbirsk province corresponded to this image. In such communes, land holdings were reallocated based on the number of resident male family members.³ Throughout the paper, I will refer to this type of communes as communes with labor-contingent repartitions or communes relying on a *male repartition rule*. Another 25% of communes also practiced repartitioning, yet they did so without taking into account family structure. Instead, they maintained the size of land holdings transferred from former landowners at the abolition of serfdom in 1861. I will refer to this type of communes as communes with a *revision repartition rule*, where revision denotes pre-emancipation peasant censuses. Finally, around 33% of communes never conducted a land repartition.

Second, I find that variation in repartitioning practices induced differential demand for formal land titles under the land reform of 1906. Figure 1 shows the unconditional average titling rates across three groups of communes. Communes that practiced a male repartition rule exhibited the lowest demand for the reform. In contrast, communes that resorted to a revision repartition rule had the highest demand for formal titles. These results prove robust to the inclusion of a wide range of socio-economic and geographic controls. In a preferred regression specification, communes that adopted a male repartition rule exhibited 7 percentage points lower titling rates by 1911 when compared to communes with a revision repartition rule. The magnitude of the difference is economically significant and corresponds to a 42% decrease over the sample average titling rate of 18%.

As long as every commune had a right to decide whether, when, and how to conduct a repartition, its land tenure regime evolved as an internal equilibrium and hence was by no means exogenous to the process of land titling. For example, some communes might have resorted to repartitioning as a reaction to the titling decisions of its members. To account for that, I focus on communes that had their last repartition before the start of the reform. Even in that case, however, unobserved factors could have affected both repartitioning practices and the demand for titling at the commune level. To address endogeneity concerns, I resort to an instrumental variable strategy that exploits climatic shocks as a potential source of uneven demographic changes.

In an economy where less than 1% of households relied on hired agricultural labor, demographic shocks likely created a mismatch between family labor and land resources, which, in the absence of the land market, necessitated an alternative mechanism of land reallocation. Such a mismatch, indeed, has been treated as a major impetus to adopting labor-contingent repartitioning by contemporaneous authors ([Vorontsov, 1892](#)). Since population growth it-

²The province of Simbirsk was situated in the southeastern part of European Russia, on the left bank of the Volga River. In 1924, the city of Simbirsk, the administrative center of the province, was renamed *Ulyanovsk* after Vladimir Lenin, who was born there. Map B.1 in the Appendix locates the province within the Russian Empire.

³Although repartitioning by family members of both genders was legal, it remained relatively uncommon by the beginning of the twentieth century. In Simbirsk province, as demonstrated below, it was practiced in fewer than 1% of all communes.

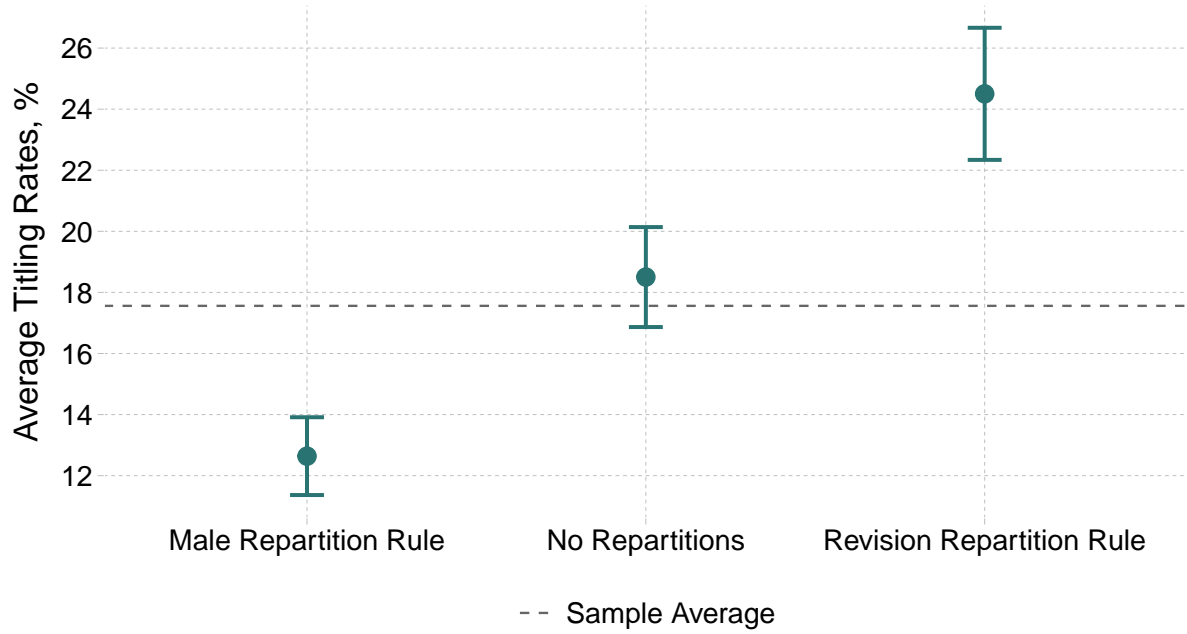


Figure 1: Titling rates across repartition rules in Simbirsk province

Notes: The average percentages of land plots titled by 1911 across the communes of Simbirsk province grouped by a land repartition rule, with 95% confidence intervals. The dashed gray line represents the average titling rate of 17.6% on the entire sample. Data cover 2,521 communes.

self might have been affected by an established land tenure regime, I resort to using average drought severity 25 years prior to the last recorded repartition. In doing so, I rely on the assumption that whereas broad climatic conditions over the long run might have affected titling rates through multiple channels, such as, for example, land prices, highly localized environmental shocks that held a potential to precipitate a change in a land tenure regime will most likely be orthogonal to other forces that were driving the demand for land titling at the moment of the reform. The instrumental variables approach confirms my earlier estimates.

Why did members of communes that practiced labor-contingent repartitions more frequently choose to forego formal titling? The existing literature suggests that land reallocations under communal tenure can serve as a substitute for poorly functioning or absent factor markets (Nafziger, 2010; Zhao, 2020). Building on this argument, I argue that only labor-contingent repartitions mitigated land misallocation by using observable family labor resources as a signal of unobserved agricultural productivity. In support of this argument, I show that communes employing a male repartition rule relied much less on the rental market than other types of communes, holding constant such factors as land endowment and soil quality. Moreover, they had the lowest share of households with no access to communal land.

In the environment that constantly imposed a threat of demographic shocks, ranging from drought-induced famines to military drafts, communes that practiced labor-contingent repartitions were better equipped to maintain agricultural production in the face of labor shortages — as documented by Dower and Markevich (2018a) for World War I. As a result, despite imposing substantial costs on the development of the rural land market, these institutions were highly valued by peasants.

This paper relates to three major literatures. First, it contributes to the discussion on the lack of demand for formalized property rights in the countryside around the globe. This literature can be subdivided into two major strands according to its interpretation of the demand for property rights. The first approach conceptualizes it as a function of the state's

ability to enforce property rights — or the citizens’ perception thereof (Ferree, Honig, Lust and Phillips, 2023; Ribar, 2023). Another approach highlights the benefits of traditional land tenure regimes that would be lost upon acquiring a formal title. However, it mostly highlights political benefits, such as traditional privilege (Honig, 2017). This paper, in contrast, focuses on their economic benefits.

In a recent study, Le Rossignol, Lowes and Montero (2024) have documented that land titling programs tend to be less successful in the parts of the world with a higher prevalence of communal landownership. Although all peasant land in Simbirsk province of the Russian Empire *de jure* fell under communal tenure, micro-level variation in the practices of land repartitioning resulted in the uneven take-up of land titling. This suggests that traditional property rights regimes vary in the benefits they provide and costs they impose in ways that depend on the highly localized context (for a related argument, see Balan, Bergeron, Tourek and Weigel, 2023). If we agree that a cost-benefit calculation guides a peasant’s decision to claim a formal title, variation in traditional property rights regimes should be taken into account by the designers of titling projects.

Second, my paper expands our understanding of property rights regimes and the persistence of inefficient rural institutions beyond Western Europe (Blaydes, 2019). One notable example is the open-field system, common both in Western Europe and Russia, under which land holdings were scattered into smaller strips across separate locations, requiring the coordination of production plans among farmers. Heldring, Robinson and Vollmer (2022) demonstrate that parliamentary enclosures of open fields in England dramatically increased agricultural productivity by removing obstacles to innovation and infrastructural investment. Yet open fields persisted across Europe until the eighteenth century, when European governments gradually started to enact the legislation guiding the process of enclosure (Grantham, 1980).

To explain their persistence, the literature has interpreted open fields as a risk-insurance mechanism that evolved as a response to spatially heterogeneous environmental shocks in the absence of insurance markets (McCloskey, 1976). By holding a portfolio of strips of different soil types and land quality, a peasant could minimize the risk of harvest failure. Unlike in Europe, in Russia, the scattering of strips was often accompanied by their periodic reallocation across families. In my paper, I argue that while land reallocation added another source of inefficiency, they also compensated for the poorly functioning land market, which likely contributed to their persistence.

The role of land repartitions in the Russian countryside appears to share similarities with that of commons in Spain. The privatization of commons, initiated in the 1850s, failed to offer an alternative set of institutions that would fulfill the functions commons had played for local communities. By eliminating a key source of revenue for funding public goods, privatization ultimately undermined living standards (Beltrán Tapia, 2015). In contrast, in regions where commons remained mostly intact, their persistence facilitated the transition to a market economy. Taken together, these findings suggest that the design of land reforms must account for the incentive structure created by traditional property rights regimes.

Finally, my paper contributes to the growing literature studying the political economy of rural institutions in the late Russian Empire. The institutions of serfdom and peasant commune have been long treated as major factors hindering the economic development of the Russian Empire (Gerschenkron, 1962). Even though recent research has demonstrated that the abolition of serfdom of 1861 and the land reform of 1906 both substantially contributed to the growth of agricultural productivity (Markevich and Zhuravskaya, 2018; Dower and Markevich, 2018b), little is known about how exactly rural institutions functioned and why they persisted for so long — mostly because local variation in these institutions was remark-

ably high (Dennison, 2011). Building on a set of papers that demonstrate the flexibility of peasant commune and its resilience to demographic shocks (Nafziger, 2010, 2016; Dower and Markevich, 2018a), I study how previously undocumented differences in communal landownership played out in peasants’ decisions to break away from commune.

2 Historical Background

2.1 Russian Peasant Commune

In the Russian Empire, the emancipation of serfs in 1861 established the institutional framework that shaped peasant landownership up until the 1917 revolution. Prior to the emancipation, only the royal family, the state, and noble landowners enjoyed property rights on land. They, in turn, allotted land plots to peasants in exchange for quitrent payments or unpaid labor on a landowner’s demesne. The emancipation law transferred property rights from former owners to peasants under buyout contracts financed by state loans. Although buyout contracts were signed individually, it was a peasant commune that the emancipation law vested with property rights on peasant land.⁴ Communal landownership deprived newly emancipated peasants of the right to collateralize or sell their land plots for the next fifty years.

Peasant communes were first institutionalized as a form of rural self-government for peasants living on state-owned land by the reforms of 1837–41. The emancipation of 1861 extended the communal arrangement to private serfs and royal peasants. A peasant commune, which usually comprised one large village or several smaller ones, was responsible for allocating and paying taxes, adjudicating conflicts, managing common resources, and regulating everyday peasant life. For example, communal agreement was required to take up work outside of the village or to perform household divisions. The heavily underbureaucratized Russian Empire relied on a peasant commune to govern roughly eighty percent of its population, at the same time restricting its own reach into communal affairs (Kotsonis, 2016).

Peasant communes legally took two forms. In hereditary communes, which prevailed in modern-day Belarus, Lithuania, and the western part of Ukraine, land allotments, though formally under communal tenure, were passed down within families across generations. Repartitional communes, widespread in the rest of the Russian Empire, in contrast, were endowed with a right to regularly reallocate land across households. This process, known as a repartition (*peredel*), could be initiated when supported by a two-thirds majority at a communal assembly (*selsky skhod*).⁵ Map B.2 in the Appendix demonstrates the distribution of repartitional communes across the provinces of the European part of the country in 1905.

While the law established a broad framework shaping communal landownership, the practice of repartitioning was regulated at the level of individual communes. Historical literature agrees that, in general, repartitions intended to match land holdings with family labor resources (Williams, 2006; Davydov, 2022). Indeed, contemporaneous sources suggested that the primary reasons motivating a repartition were asymmetric demographic changes and migration leading to the accumulation of uncultivated land (Vorontsov, 1892). Communes, however, differed substantially in the frequency of repartitioning. Some communes stopped

⁴In Russian-language literature, the notions of *krestyanskaya obshchina*, *selskoye obshchestvo*, and *mir* have been used interchangeably to denote a peasant commune. While the laws of the Russian Empire employed the notion of *selskoye obshchestvo* or a rural community, historical literature has been mostly using the notion of *krestyanskaya obshchina* or a peasant commune.

⁵Table A.1 in the Appendix lists the Russian versions of the historical terms mentioned in the paper along with their translation and explanation.

conducting repartitions after the abolition of serfdom; others would repartition as often as every three years (Nafziger, 2016).

Communal assemblies debated not only whether and when to conduct a repartition, but also how to allocate land across households. Alongside numerous local variations, communes approached land repartitioning in two main ways. First, communes could redistribute land by the number of resident male family members. I refer to this arrangement as a *male repartition rule*.⁶

Second, they could retain the land plot sizes assigned to households at the time of emancipation in 1861, reallocating parcels of land among households based on the number of revision souls (*dushi*, pl.), the term referring to taxable male population.⁷ Before 1861, a tax census, also called a revision (*reviziya*), had been conducted every 15-20 years by the government to establish the sum of per capita peasant taxes. In the process of the emancipation, all taxable males — or souls — recorded in the tax census of 1857–59 were entitled to an allotment. For simplicity, I refer to this repartitioning practice as a *revision repartition rule*. After 1861, repartitions remained rare as long as the distribution of allotments corresponded to the composition of families, but demographic changes and an increase in land prices motivated the spike in repartitions in the late 1870s – early 1880s.

Different repartition rules were associated with differential gains and losses for different households; that, along with the decision of whether or not to conduct a repartition shaped the internal politics of a commune. In an attempt to address inequalities created by the current repartition, a new repartition was often sought.⁸ Whether a commune would in fact conduct a repartition and what rule it would adopt depended on the interplay of factors, such as bargaining power of those opposing a new repartition, the ratio of opponents to advocates, and a capacity for intra-communal negotiation (Vorontsov, 1892). Structural factors, such as the institutional legacy of serfdom or the proximity of major markets, also played a role. For example, in contrast to state- or crown-owned villages, serf owners did not conduct repartitions on a regular basis before the emancipation, making former serfs less likely to engage in repartitioning. Nevertheless, even neighboring communes not infrequently displayed dramatically different land tenure regimes.

2.2 Stolypin Land Reform

At the turn of the twentieth century, the Russian Empire remained a predominantly rural society, with peasants comprising more than eighty percent of its total population. Communal landownership and open fields, mostly gone in Western Europe, still permeated peasant agriculture. Peasant land was scattered into multiple unfenced strips across a communal field, enforcing adherence to a communally regulated rotation of crops and farming. It was precisely open fields and the practice of repartitioning that the land reform of 1906 targeted.

The reform, commonly known as the Stolypin reform after its mastermind Prime Minister Pyotr Stolypin, aimed at enhancing the efficiency of peasant agriculture at multiple levels. First, it enabled peasants to apply for a private land title securing the land in current

⁶By the turn of the twentieth century, some communes reportedly started to switch to repartitioning by the total number of residents – irrespective of gender (Kachorovsky, 1906). However, as a reader will see later, my sample includes almost none of such communes.

⁷A reader can remember Nikolay Gogol’s novel *Dead Souls*.

⁸For example, in the village of Rovnoye in Samara province, “one fraction has always sought to repartition by revision souls, and another one by resident souls. Both happened to be almost equal in size, and because the law requires two thirds of votes at a communal assembly, the commune cannot reach an agreement for the second year in a row now...” (Dietz, 1891)

possession from future repartitions. Titled land could be used as a collateral or sold to other peasants. Second, the reform allowed peasants to consolidate their land strips into a single plot. In both cases, the law absolved peasants from the hold of a commune, providing a legal means of overcoming communal resistance. With an agreement of two-thirds of a communal assembly, a commune could also conduct a village-wide consolidation.⁹ In this paper, I will focus on land titling.

To obtain a land title, a peasant would submit an application to a communal assembly.¹⁰ The peasant could claim at no cost the amount of land he would get if a repartition was conducted at the moment of application. If he had extra land in current possession, it could be titled for a below-market price. Within a month, the communal assembly and the peasant had to negotiate the terms of titling. If a negotiation failed and the commune turned down the application, a peasant had a right to complain to an overseeing bureaucrat — a land captain (*zemsky nachalnik*) — who was empowered to issue a land title without the commune’s consent. All titles had to be submitted to and approved by the district peasant administration (district assembly or *uezdny syezd*).

Recent studies have demonstrated that the Stolypin reform contributed to the rise of agricultural productivity and the development of the land and labor markets. Village-wide consolidations, by reducing coordination costs, yielded a positive effect on grain productivity and the inflow of agricultural machines (Dower and Markevich, 2018b). Having alleviated restrictions on non-agricultural employment for peasants, the reform also increased land liquidity and encouraging domestic mobility (Chernina, Dower and Markevich, 2014). Acquiring a title enabled peasants to sell their land allotments, helping them move to a city or other provinces of European Russia or Siberia.

By 1915, the last year for which systematic data on the implementation of the reform was published, around 2 million households across 39 provinces of the European part of the Russian Empire had acquired land titles.¹¹ This constituted around 20% of the total number of households holding land under repartitional tenure. After accounting for households who submitted but then withdrew their applications, most likely, under the pressure of fellow commune members, the share increases to 27% (Davydov, 2022). However, there was a substantial variation in titling rates across provinces that ranged from 3% to 55%.

2.3 Peasant Responses to the Reform

The local variation in repartitioning practices most likely shaped the perceived costs and benefits of land titling under the Stolypin reform. The qualitative evidence on this can be found in peasants’ responses to a survey conducted in ten central provinces in 1910–11 by the Free Economic Society, a non-governmental research organization.¹² When asked, if they preferred private or communal land tenure, a peasant from Saratov province, neighboring Simbirsk, explained:

“To my mind, communal landownership is better for our area... Upon every next repartition, land will be taken away from the dead and transferred to the newly born.” (Chernyshov, 1917b)

⁹The reform also included other forms of streamlining landownership, such as land consolidation under communal land tenure or the abolition of land interstripping between different communes or between communes and private landholders.

¹⁰Complete collection of laws of the Russian Empire. 28528. November 9, 1906.

¹¹Data come from Central Statistical Committee (1916).

¹²The results of the survey are summarised in Chernyshov (1917a,b).

This description corresponds to labor-contingent repartitions, which adjusted the number of allotments in response to changes in family size due to fertility or mortality. Under land and labor market restrictions, such adjustments acted as a substitute for market mechanisms. Although the reform of 1906 lifted some of these restrictions, the uneven uptake of formal titles suggests that many peasants continued to rely on communal institutions. In contrast, communes that repartitioned land by revision souls, without adjusting the size of a land plots, were less responsive to demographic shocks. This likely diminished the value of communal institutions for their members.

The reform also provided a legal framework to protect peasants whose land rights were most vulnerable to repastitioning practices. Peasant respondents reported that villagers who would lose land in an upcoming redistribution, along with widows, the elderly, and migrants, showed the greatest demand for land titling. For example, in communes with a male repartition rule, male deaths between repartitions implied that a household would be entitled to a smaller plot in the next repartition. Similarly, peasants who had ended up with land of higher-than-average quality in a communal field in a previous repartition had an incentive to claim a title before a new repartition was announced by the commune.

Communes that held their land in repartitional tenure but did not practice repartitioning offered their members relatively secure informal property rights on land. In such communes, obtaining a land title did not appear to bring about any tangible benefits — unless a peasant sought to sell their allotment. A peasant from Ryazan province, who lived in a commune where no repartitions had been conducted since the emancipation, reported:

“A good farmer isn’t even thinking about titling. He knows the land is already his. What is then the point of titling it? It’s just the same land, it won’t grow any bigger.” (Chernyshov, 1917a)

Historical sources suggest that returning migrants or first-mover titlers sometimes induced other peasants to engage in preventive titling. Industrial migrants who had moved to cities before the reform often returned to their home communes to claim and sell a land plot.¹³ Distributing land to returning migrants imposed cut-offs on other members of a commune. In the communes where the share of migrants was substantial, the members of the commune often preferred to title before migrants could raise their claims (Peshekhonov, 1909).

While the fear of returning migrants equally affected all types of the communes regardless of their institutional structure, the first-mover effect was likely to be observed only in the communes with active repartitions. Peasants who acquired land titles depleted a communal land pool that could be used for future repartitioning. The expected value of a future repartition for peasants remaining in the commune was declining with titled area and the quality of titled land, making second-movers more likely to title after first-movers did. Historical literature suggests that sometimes entire villages opted for preventive titling to preempt this type of dynamics (Pallot, 1999).

3 Data

For this paper, I take advantage of the peasant census conducted by the *zemstvo* of Simbirsk province (*gubernia*) in 1910–11.¹⁴ The peasant censuses were local initiatives uncoordinated

¹³Historical records suggest that peasants who travelled as far as to San Francisco rushed to claim their land plots after the reform was enacted with an intention of selling it (Zyrianov, 1992).

¹⁴Data for each district were published in a separate volume between 1913 and 1915. Data aggregated to the township level was published in Simbirsk Provincial Zemstvo (1913).

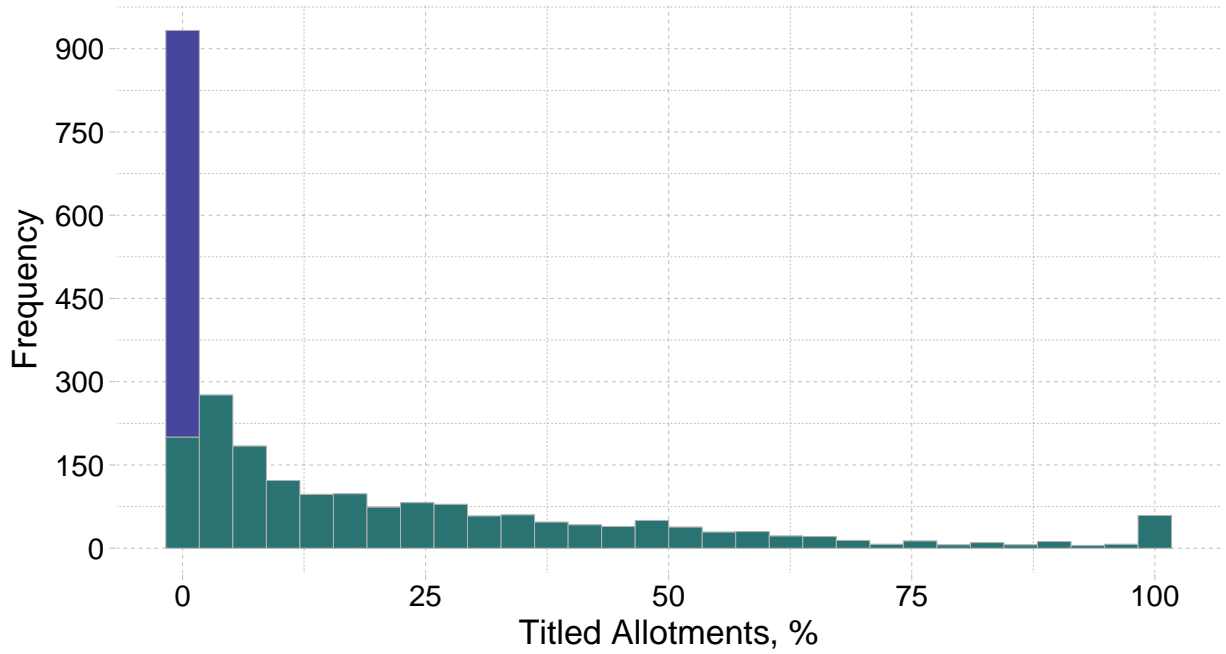


Figure 2: Percentage of titled allotments across the communes of Simbirsk province by 1911

by the central government and did not follow a standardized research program. They mostly focused on land usage and agricultural production, and the results were usually published at the commune level. The earliest censuses were conducted in the late 1870s. Due to high costs and limited resources of local statistical offices, only a handful of the most affluent provinces could afford running censuses at a regular interval.¹⁵ The Simbirsk census, conducted five years into the reform implementation, uniquely recorded both the number of land titles acquired under Stolypin the reform and the characteristics of local repartitioning practices. I digitized the Simbirsk census and excluded all communes that did not have any allotment land or registered population from my sample. This left me with 2,521 communes in 1,645 villages of Simbisk province.

The outcome variable of interest is the share of communal allotments titled by 1911. In Simbirsk province, on average, a commune assigned 1.8 allotments to a household, with 75% of communes assigning less than 2.3 allotments. The average allotment covered the area of 3.4 hectares (or 8.4 acres).¹⁶ Figure 2 demonstrates the distribution of land titling rates in Simbirsk province. The distribution is skewed to the right with around 30% of communes not reporting any titled allotments (colored with purple). The distribution also shows a small spike at 100%, potentially reflecting the preventive titling mechanism discussed in Section 2.3. The average titling rate is 17.6%; in a subsample of communes with at least one titled allotment, it increases to 24.8%. Figure 3 demonstrates the spatial distribution of titling rates aggregated to the level of villages.

To capture local variation in repartitioning practices, I relied on the information about repartition rules and the intensity of repartitioning. First, I record whether a commune reallocated land across households based on the number of resident male family members. Then, for each commune, the census also reports the year of the most recent repartition. If

¹⁵Before the Bolshevik Revolution, one-third of all provinces had had conducted only one local census since the late 1870s, and another had conducted no censuses at all.

¹⁶Figure B.3a in the Appendix shows the distribution of the number of allotments per households across the communes of Simbirsk province. Figure B.3b demonstrates the distribution of the average allotment size in hectares.

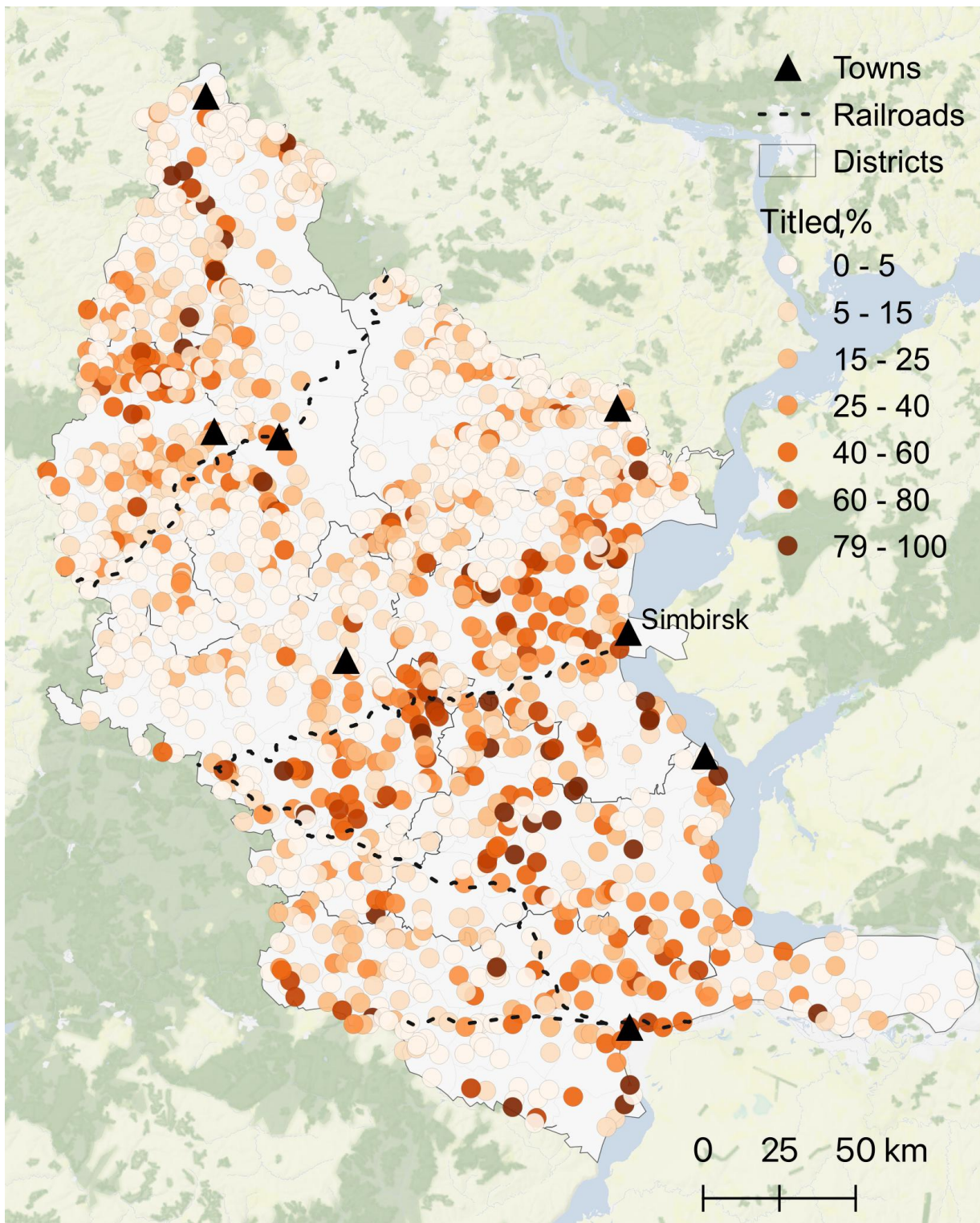


Figure 3: Geography of Titling Rates, %

Notes: Map depicts the spatial distribution of the percentage of titled allotments across the villages of Simbirsk province in 1911. Darker dots denote higher titling rates. Black triangles represent towns; black dashed lines show the location of railroads in 1914.

a commune did not conduct any repartitions after the abolition of serfdom, I classified it as not practicing repartitions.

To control for other incentives to claim a land title, I compiled data on average family size, the number of households in a commune, literacy rates, and the proportions of migrant households and households with no working males from the Simbirsk census. I supplemented it with data on pre-emancipation peasant status — specifically, former serfs, state-owned or crown-owned peasants, prevalent ethnicity and soil type in each commune.

The Simbirsk census also provides information on the functioning of the rental market. It records the number of households leasing land in each commune and the area of rented land. Using these data, I calculated measures of engagement in the rental market. For the entire sample, I computed the percentage of households renting land. For the subsample of households who were renting land, I calculated the average area of a rented-in plot.

To supplement my analysis with geographical data, I created a GIS shapefile of Simbirsk villages based on the topographic map of Simbirsk province compiled by Alexander Mende between 1859 and 1861. Out of 1,645 villages, I successfully geolocated 1,630. Using the shapefile, for each village, I computed the distances, in kilometers, to the centers of respective townships, the administrative centers of respective districts, and the nearest railroads. Since I lack information on the exact locations of communal fields, I calculated the average terrain ruggedness and the share of forest landcover within a 10-km radius surrounding each village to account for environmental conditions using data from [Shaver et al. \(2019\)](#).¹⁷

To control for the supply of the reform, I collected data on land captains — local bureaucrats who run the reform on the ground — to control for the supply of the reform on the part of the state ([Dower and Markevich, 2018b](#)). Each land captain in Simbirsk province, on average, oversaw four townships.¹⁸ I retrieved information about vacant land captain offices and land captain turnover during the period of the reform implementation from memorandum books, which listed the names and addresses of local administrators. Between 1906 and 1912, three memorandum books were published in Simbirsk province. First, I recorded whether a land captain office had been vacant any time between 1906 and 1912. Second, I counted the number of unique land captains per land captain district; the variable ranges between one and three.

Finally, to approximate the peasants' trust in state institutions, I measured the intensity of peasant unrest against noble landowners during the Revolution of 1905–07 to control for the level of trust in the state. Using the register of criminal sentences annually published by the imperial Ministry of Justice, I first computed the number of total criminal charges raised between 1906 and 1908 across villages of Simbirsk province. Then I zoomed in on criminal charges on the basis of disobedience to the law coupled with murder or arson conducted out of hate against victim's estate affiliation — the criminal code paragraph that was added to specifically persecute participation in the turmoils during the 1905–07 Revolution. I normalized both variables by the total village population.

Table [A.2](#) in the Appendix reports the descriptive statistics for the variables used throughout the paper.

¹⁷According to [Williams \(2006\)](#), around 25% of peasants travelled a distance of up to 5 *versts* ($\simeq 5$ km) to reach their most remote strips, and around 60% of peasants 10 *versts* ($\simeq 10$ km). As a robustness check, I also calculated terrain ruggedness and forest landcover within a 5-kilometer and a 15-kilometer radius.

¹⁸This corresponded to the area of approximately 1000 sq. km or 400 sq. miles and the average rural population of 37 thousand.

4 Peasant Commune in Simbirsk Province

The province of Simbirsk was a typical agricultural province of the Russian Empire. Situated on the left bank of the Volga River, it covered an area of 49.5 thousand square kilometers — roughly the size of present-day Slovakia. According to the 1897 Imperial Census, slightly more than 1.5 million people lived in eight administrative districts of the province, 94% of whom were peasants. Orthodox Christians comprised around 88% of the population; 68% were Russians.¹⁹ Simbirsk’s urbanization rate and the size of its agricultural sector were close to the empire’s median — 7% as opposed to 9% and 60% as opposed to 58% respectively.²⁰ Most importantly, Simbirsk province was representative of prevalent peasant land tenure regime in central Russia. Roughly 98% of peasant communes formally held their land under repartitional tenure — slightly higher than the empire-wide median of 96%.²¹

My data, however, indicate that the practice of land repartitioning varied substantially across the communes of Simbirsk province. Table 1 groups communes by their repartition rule. It shows that around 42% of them repartitioned land based on the number of male family members.²² Of these, five communes did not record a single repartition after the abolition of serfdom. Although repartitioning by family members of both genders existed in Simbirsk province, it remained relatively uncommon by the beginning of the twentieth century and was practiced in only 20 communes. In contrast, 57% of communes reported repartitioning land based on the number of revision souls — male population figures recorded in the last pre-emancipation tax census of 1857–59.²³ Slightly more than a half of these communes, however, conducted no repartitions since 1861, indicating that the practice of repartitioning died out after the abolition of serfdom. Finally, only less than 0.5% of communes held their land in hereditary tenure.

It appears that land repartitioning may have shaped the demand for land titling in Simbirsk province. Column (3) of Table 1 reports the average titling rates for each subgroup. Communes employing a revision repartition rule had, on average, titling rates nearly 10 percentage points higher than those using a male repartition rule. Moreover, there seems to be a heterogeneity within the subgroup of communes that reported using a revision repartition rule, depending on whether they actually practiced repartitioning. Conditional on a repartition rule, communes with active repartitions exhibited higher titling rates than those where repartitioning had become obsolete.

¹⁹Mordvins, Chuvashs, and Tatarts constituted the most notable minorities in the province comprising 12%, 10%, and 9% of the population respectively. Mordvins and Chuvashs were predominantly Orthodox, and Tatarts Muslims.

²⁰Figure B.4 in the Appendix shows the distributions of urbanization rate and the share of value added in agriculture in 1897.

²¹Data come from the landownership census conducted in 1905 (Central Statistical Committee, 1907).

²²Among these communes, around 10% imposed various age restrictions. Such restrictions can be interpreted as a reaction to high infant and child mortality, aimed at preventing households from acquiring land for children unlikely to survive (Natkho and Vasilenok, 2022).

²³Figure B.6 in the Appendix shows the relationship between the resident male population and the number of communal allotments (or, alternatively, the number of souls entitled to an allotment during a repartition) by a repartition rule. In communes that employed a male repartition rule, dots roughly align with the 45-degree line, suggesting that all male members of a commune were entitled to an allotment. In communes that employed a revision repartition rule, in contrast, dots fall below the 45-degree line, reflecting population growth since the late 1850s. Figure B.7 performs the same exercise using pre-emancipation population numbers. Now, male population in 1859 roughly corresponds to the number of allotments in 1911 in communes with a revision repartition rule, but not in communes with a male repartition rule.

Table 1: Communes by Repartition Rule

	(1) Number of communes	(2) % of communes	(3) Titled, %
Male repartition rule	1,054	41.8	12.7
No repartitions	5	0.2	10.9
Active repartitions	1,044	41.4	12.6
Revision repartition rule	1,437	57.0	21.1
No repartitions	793	31.5	18.4
Active repartitions	642	25.5	24.5
Both genders	20	0.8	13.5
Hereditary	10	0.4	31.4
Total	2,521	100	17.6

Notes: Data come from [Simbirsk Provincial Zemstvo \(1913\)](#). Grey rows show the subgroups of the white rows above. Column (3) reports group means.

5 Empirical Strategy

5.1 Baseline Equation

To quantify the effect of land repartitioning practices on the demand for land titling under the 1906 reform, I focus on the following equation:

$$Titling\ Rates_{ij} = \beta_0 + \beta_1 Male\ Repartition\ Rule_{ij} + \beta_2 No\ Repartitions_{ij} + \mathbf{X}\mathbf{B} + \mu_j + \varepsilon_{ij}, \quad (1)$$

where $Titling\ Rates_{ij}$ is the percentage of allotments titled in a commune by 1911. The independent variables of interest, $Male\ Repartition\ Rule_{ij}$ and $No\ Repartitions_{ij}$, reflect the variation in local practices of land repartitioning. Note that $Male\ Repartition\ Rule$ and $No\ Repartitions$ are mutually exclusive and cannot both equal one at the same time, and that a baseline represents commune that employed a revision repartition rule.

To compare communes that employed different repartition rules, I define *Male Repartition Rule* as a dummy variable that takes on a value of one if a commune repartitioned land holdings based on the number of resident male family members. For a more straightforward comparison, I excluded twenty communes that repartitioned land by the number of family members of both genders from the sample.²⁴ I further exclude ten communes that held their land in hereditary tenure. In that case, the coefficient β_1 measures the average difference between communes that employed a male repartition rule and communes that employed a revision repartition rule.

The second variable, *No Repartitions*, captures the absence of a reallocation threat on part of the commune. I measure it as a dummy variable that takes a value of one if a commune never conducted a repartition after the abolition of serfdom.²⁵ In that case, the coefficient β_2 reflects the average difference in titling rates between communes that never had a repartition and communes that employed a revision repartition rule.

²⁴The results stay the same if I combine these communes with communes that repartitioned land by male family members.

²⁵Only 38 communes had their last repartition between 1862 and 1881 (see Table A.3 and Figure B.5 in the Appendix). One can speculate that a probability of these communes having another repartition is sufficiently small. If I redefine *No Repartitions* encoding these communes as positives, the results stay the same.

The set of covariates \mathbf{X} consists of socio-economic and geographic controls. Socio-economic controls include average allotment size (in hectares), average family size, commune population (in households), the percentage of households with no working males, the percentage of migrant households residing outside the commune, literacy rates, a dummy for ethnic Russians, and a dummy for former serfs. Geographic controls include a dummy for the presence of fertile chernozem soils within a communal field, average ruggedness, the percentage of forest landcover, and distances to a township center, to a district town, and to the nearest railroad (in kilometers). Unobserved district-level heterogeneity – for example, bureaucratic efficiency in reform implementation that might have varied across district administrations – is captured by district fixed effects μ_j . Throughout the paper, standard errors are adjusted for spatial autocorrelation within 10 km following [Conley \(1999\)](#).

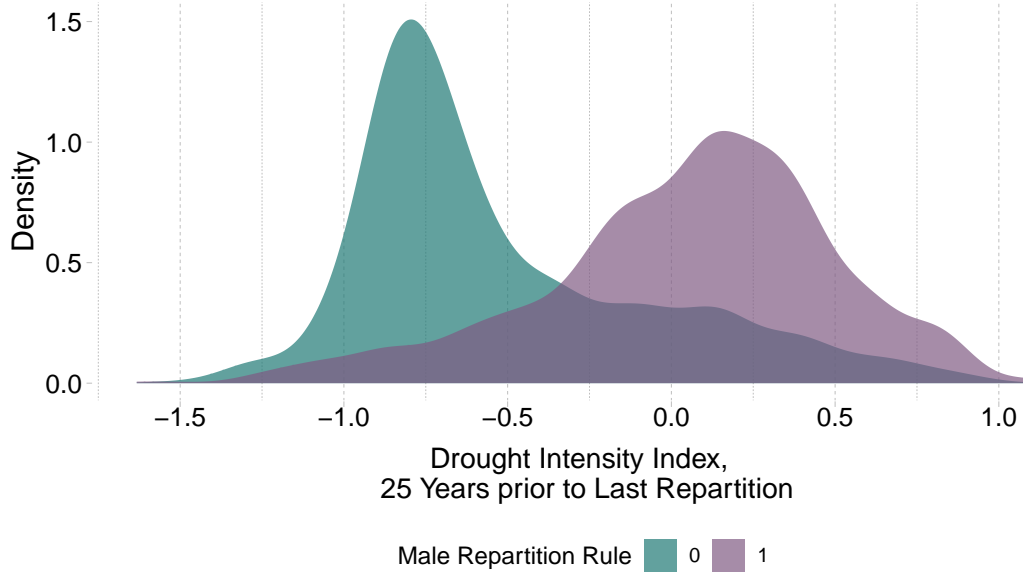
5.2 Identification

It might be too ambitious to treat land repartitioning as exogenous to an individual decision to claim a formal land titling. First of all, historical literature suggests that some communes engaged into strategic repartitioning to prevent from titling those of their members who would benefit from it the most under current land allocation ([Pallo, 1999](#)). In Simbirsk province, around 16% of communes conducted their last repartition after 1906. The communes that engaged in post-reform repartitioning appeared to be more vulnerable to economic incentives than those who did not; such communes had a smaller average allotment size and worse agricultural land. Such communes also overwhelmingly employed a male repartition rule. Although slightly lower, which might imply that strategic repartitioning did indeed discourage some communal members from titling, the average titling rate in such communes does not differ significantly from communes that had their last repartition before the reform (See Table A.4 in the Appendix). Nonetheless, to mitigate endogeneity concerns, I drop such communes from the sample and focus in my analysis on the communes that had their last repartition before the start of the reform implementation.

Even in that case, however, unobserved factors may have been at play that affected both repartitioning practices and the demand for titling at the commune level. I next resort to an instrumental variable strategy in which I exploit historical climatic shocks as a potential source of exogenous variation in repartitioning practices. Climatic shocks might have affected the choice of a repartition rule if they brought about demographic changes that were uneven across families.²⁶ In an economy where less than 1% of households relied on hired agricultural labor, demographic shocks likely created a mismatch between family labor and land resources, which, in the absence of a land market, necessitated an alternative mechanism of land reallocation. Such a mismatch, indeed, has been treated by contemporaneous authors as a major historical impetus to adopting labor-contingent repartitioning ([Vorontsov, 1892](#)).

To get at a source of exogenous variation in demographic changes, I exploit variation in climatic shocks. Relying on village coordinates, I computed the average historical Palmer Drought Severity Index (PDSI) for each commune over 50, 25, and 5 years prior to its last repartition using data from [Burnette \(2021\)](#). I expect that there is a tipping point in the accumulation of imbalances in land distribution across families, upon reaching which a commune becomes much more likely to conduct a new repartition while adopting a male repartition rule. While marginal imbalance might not be noticeable to a commune, a sub-

²⁶This appears to be a plausible assumption. Demographic shocks, such as famines or epidemics, tend to target first the most susceptible groups of population, such as the children or the elderly, when families tend to be at different stages of their life cycle.



Notes: Figure demonstrates the average values of the Palmer Drought Severity Index multiplied by minus one (to make larger values represent higher intensity) over 25 years preceding the last repartition. Purple distribution represents communes that employed a male repartition rule in 1911. Data come from [Burnette \(2021\)](#).

Figure 4: What shaped the variation in land repartitioning practices?

stantial one will create a strong demand for a repartition.²⁷ Such a tipping point is more likely to have been reached over the medium run, rather than the short run.

Figure 4 demonstrates that communes that experienced a higher drought intensity over the last 25 years before the last repartition (corresponding to smaller values of the PDSI) were more likely to adopt a male repartition rule. I then instrument the adoption of a male repartition rule with historical drought intensity. To conduct a placebo test to make sure that the instrument does not capture general geo-climatic conditions, for each commune, I also compute the average PDSI values over a 25-years period prior to a random year between 1861, when the serfdom was abolished, and 1906, when the land reform was implemented.

5.3 Specification

The distribution of the dependent variable, as shown in Figure 2, is highly right-skewed, with the mean exceeding the median by approximately ten percentage points. The long right tail of the distribution can introduce bias into the coefficient estimates. At the same time, the data-generating process allows for zeroes in the dependent variable, with around 30% of communes reporting no titled allotments. This poses challenges for applying a log-like transformation to the dependent variable to “correct” for asymmetries in the distribution.

The presence of zero outcomes invalidates the interpretation of estimates in terms of average percentage change, as individual-level treatment effects are not defined for observations whose potential outcomes go from zero to non-zero ([Chen and Roth, 2024](#)). In such cases, it is recommended to use Poisson regression, where the estimates express the average treat-

²⁷For example, according to [Vorontsov \(1892\)](#), in Kursk province, the adoption of a labor-contingent repartition rule “by the residents of Veretinnaya village (in 1884) and Sergeevka village (in 1882) is explained via the accumulation a large number of empty allotments whose owners died or left a commune.”

ment effect as a percentage change relative to the average control outcome.²⁸ Alternatively, it might be helpful to estimate the effect of the treatment on a dichotomized dependent variable that indicates if an individual outcome exceeds a certain threshold. For example, one might be interested in seeing how adopting a male repartition rule changes the probability that more than 25% of allotments will be titled in a commune.

In the paper, I will follow both strategies. First, I will verify the OLS estimates against the Poisson QLME estimates, and then apply the instrumental variable strategy to both types of models (Wooldridge, 2014). Then, I will examine the effect of the choice of a repartition rule on the probability of more than $\alpha\%$ of allotments having been titled in a commune, where α represents the percentiles of the distribution of the dependent variable.

6 Results

6.1 Baseline Specification

Table 2 presents the results from estimating Equation 1. Columns (1) through (3) report coefficient estimates obtained using the OLS estimator. Column (1) examines the relationship between titling rates, on the left-hand side, and dummies for a male repartition rule and the absence of repartitions, on the right-hand side. Column (2) adds the full set of controls, and Column (3) introduces district fixed effects. In contrast, Column (4) report the results of estimating the Poisson regression model using QMLE, including both the full set of controls and fixed effects. Standard errors adjusted to spatial correlation within a 10-km radius are reported in parentheses.²⁹ Table A.5 in the Appendix reports the full set of controls, and Section D of the Appendix discusses the economic correlates of land titling.

The results suggest that the choice of repartition rule played an important role in shaping the demand for land titling. Across all specifications, peasants living in communes that adopted a male repartition rule exhibited the lowest demand for land titling. The coefficient on *Male Repartition Rule* is negative and highly significant across all specifications. On average, titling rates in communes with a male repartition rule were 7 percentage points lower than in communes with a revision repartition rule. The difference is economically significant and corresponds to a 42% decrease over the sample average of around 18%. The coefficient from the Poisson regression in Column (4) shows a similar magnitude of 35% difference in titling rates between communes that did and did not employ a male repartition rule.

Second, the results indicate that communes that did not practice repartitioning exhibited lower titling rates than communes with a revision repartition rule. In the full specification reported in Column (3), the difference in titling rates between communes that did and did not practice repartitioning was around 4 percentage points. This result suggests that land titling did not yield the same benefits in communes with relatively secure property rights as it did in those where peasants constantly faced a threat of expropriation. Leveraging of the 1893 law that limited the frequency of repartitions to a minimum of twelve years, Section E of the Appendix demonstrates that land titling rates increased in anticipation of an upcoming repartition.

²⁸More formally, Poisson regression will estimate $E[Y(1) - Y(0)]/E[Y(0)]$ instead of $E[(Y(1) - Y(0))/Y(0)]$.

²⁹Section C in the Appendix reports the results of the robustness check for spatial autocorrelation and reports standard errors computed using different distance cut-offs. The coefficient on *Male Repartition Rule* remains robust to spatial autocorrelation within any distance that was found to exhibit spatial interdependence according to the Moran's test.

Table 2: Land Titling and Repartitioning Practices

	<i>Dependent variable:</i>			
	Titling Rates, %			
	(1)	(2)	(3)	(4)
Male Repartition Rule	−11.006*** (1.942)	−7.141*** (1.996)	−7.441*** (1.886)	−0.430*** (0.096)
No Repartitions	−5.247** (2.142)	−4.928** (1.985)	−4.084** (1.951)	−0.189** (0.092)
Controls		✓	✓	✓
District Fixed Effects			✓	✓
Estimator	OLS	OLS	OLS	Poisson QMLE
Mean of DV	17.8	17.8	17.8	17.8
Standard deviation of DV	23.6	23.6	23.6	23.6
Observations	2,034	2,034	2,034	2,034
Adjusted R ²	0.033	0.109	0.122	—

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the percentage of allotments titled by 1911. The set of controls includes average allotment size, average family size, communal population, the percentage of migrants, the percentage of households with no working males, literacy rates, dummy variables for former serfs, ethnic Russians, and chernozem soil, average ruggedness, the share of forest landcover, and distances to the township center, the district administrative center, and the nearest railroad. Standard errors adjusted to spatial correlation within 10 km following [Conley \(1999\)](#) in parentheses.

*p<0.1; **p<0.05; ***p<0.01

6.2 Instrumenting Repartitioning Practices

To account for possible endogeneity between the choice of a repartition rule and the demand for land titling under the reform of 1906, as discussed in Section 5.2, I instrument *Male Repartition Rule* with average historical drought intensity 25 years prior to the last repartition.

There indeed appears to be a tipping point in the accumulation of imbalances in land distribution across families induced by climatic shocks, prompting an adoption of a male repartition rule. Panel A of Table A.6 in the Appendix demonstrates the first-stage coefficients from the regressions of *Male Repartition Rule* on the average drought intensity over 50, 25, 10, and 5 years prior to the last repartition. The strength of the association between drought intensity and the adoption of a male repartition rule increases with time. There is no significant association for short-run average climatic shocks over the period of 5 years, and the coefficient is negative. The relationship becomes positive and significant for 10-year shocks, yet its magnitude remains small. It then grows in strength for medium- and long-run shocks of 25 and 50 years respectively. Panel B, in turn, reports the reduced form coefficients. A significant negative association between drought intensity and titling rates is observed only for the medium-run shocks.

Table 3 reports the results of the instrumental variables estimation. Columns (1) and (3) instrument *Male Repartition Rule* with the average drought intensity over 25 year prior to the last repartition, and Column (2) and (4) with the placebo drought intensity averaged over 25 year prior to a randomly selected year between 1861 and 1906. Coefficient estimates are

Table 3: Instrumenting Repartition Rule

	<i>Dependent variable:</i>			
	Titling Rates, %			
	2SLS		Poisson QLME	
	(1)	(2)	(3)	(4)
	25 years	Placebo	25 years	Placebo
<i>Panel A: Reduced Form</i>				
Drought Intensity	−3.958** (1.901)	0.300 (1.338)	−0.275*** (0.104)	0.023 (0.073)
<i>Panel B: Second Stage</i>				
Male Repartition Rule	−19.935** (10.09)	−22.198 (100.4)	−1.391** (0.640)	−1.671 (406.6)
Effective F	32.396	0.514	32.396	0.514
Anderson-Rubin Test	4.385**	0.051	—	—
Anderson-Rubin CI	[−43.35; −1.38]	[−∞; ∞]	—	—
Full controls	✓	✓	✓	✓
District fixed effects	✓	✓	✓	✓
Mean of DV	17.8	17.8	17.8	17.8
Standard deviation of DV	23.6	23.6	23.6	23.6
Observations	2,034	2,034	2,034	2,034

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the percentage of allotments titled by 1911. Standard errors clustered at the level of villages in parentheses. Bootstrapped standard errors reported in Columns (4) and (5).

*p<0.1; **p<0.05; ***p<0.01

obtained using the 2SLS and Poisson QMLE estimators in Columns (1) and (2) and Columns (3) and (4) respectively. Following the recommendations by Lal, Lockhart, Xu and Zu (2024), I report effective first-stage F -statistics that account for village-level clustering, along with the Anderson-Rubin test and confidence intervals that are robust to weak instruments.

The instrumental variable approach confirms my earlier estimates. Drought intensity appears to be a strong instrument for the choice of a repartition rule; the effective first-stage F -statistics equals to 32.4, well above the conventional threshold of 10. In contrast, it is only 0.5 for the placebo instrument. The Anderson-Rubin test rejects the null hypothesis of no reduced-form effect at the 5% significance level for the average drought intensity but fails to do so for the placebo instrument. According to the estimates reported in Column (3), adopting a male repartition rule appears to reduce land titling rates by 75% on average compared to adopting a revision repartition rule, conditional on practicing repartitions.³⁰ In contrast, instrumenting *Male Repartition Rule* with placebo climatic shocks fails to uncover any effect with an unbounded AR confidence interval.

Figure B.8 in the Appendix offers an alternative interpretation of the magnitude of the

³⁰The magnitude has been calculated as $100 \times (\exp(\hat{\beta}_1) - 1)$, which is the implied estimate of the proportional treatment effect (Chen and Roth, 2024).

treatment effects. It presents the estimates of the effect of *Male Repartition Rule*, instrumented with average drought intensity, on the probability that more than $\alpha\%$ of allotments were titled in a commune. The thresholds α correspond to percentiles of the titling rates distribution, ranging from the 25th percentile of 0% to the 90th percentile of 52% with a 5 percentage-point increment. The strongest effect is attained at the median of the titling rate distribution; the probability that more than 7% of allotments are titled in a commune decreases by 0.9 if the commune employs a male repartition rule.

6.3 Alternative Explanations

Prior research has argued that the demand for formal titles depends on the supply of titling and the popular perception thereof — specifically, depends on the enforcement capacity of the state and the level of public trust in it. In the case of the land reform of 1906 in the Russian Empire, the overburdening of land captains — local bureaucrats responsible for implementing the reform — has been shown to slow down the titling process (Dower and Markevich, 2018b). In addition, contemporaneous sources have documented instances of peasant distrust in the security of issued titles (Chernyshov, 1917a). To test the robustness of my results to the supply-side explanations of land titling, I have collected data on land captain turnover as a measure of bureaucratic capacity and sentences for peasant unrest between 1906 and 1911 as a measure of trust in the state.

Table A.7 in the Appendix reports the results. In Column (1), I control for a dummy variable indicating whether a land captain office overseeing a commune had been recorded as vacant at least once between 1907 and 1912. In Column (2), I control for the number of distinct land captains overseeing a commune between 1907 and 1912 — ranging from one to three, with one serving as a baseline. In Column (3), I include the logarithm of the total number of criminal convicts from a village between 1906 and 1911, normalized by the village population. In Column (4), I focus specifically on convictions for peasant unrest and crimes against local landowners such as murders or estate arson.

I find that both explanations — bureaucratic capacity and trust in the state — appeared to have played a role in shaping the process of the reform implementation. The lack of personnel and more frequent land captain turnover are both negatively and significantly associated with lower land titling. Similarly, a higher number of local convicts seems to be negatively associated with the adoption of the reform. However, both repartitional variables — *Male repartition rule* and *No repartitions* — remain robust to the new controls and retain their signs, magnitudes, and significance.

7 Mechanisms

7.1 Land Market

In the absence of a formal market, agricultural land often ends up being inefficiently allocated across farmers (Chen, Restuccia and Santaaulalia-Llopis, 2023). To improve the efficiency of land allocation, peasants in Russia developed two major mechanisms: labor-contingent repartitions and land rentals. Under labor-contingent repartitions, communes used observable family labor resources as a signal of unobserved agricultural productivity. Alternatively, peasants could enter the rental market — leasing land either from private noble and merchant landowners or from fellow peasants.

In theory, repartitions and rentals were not mutually exclusive. In a study of Moscow

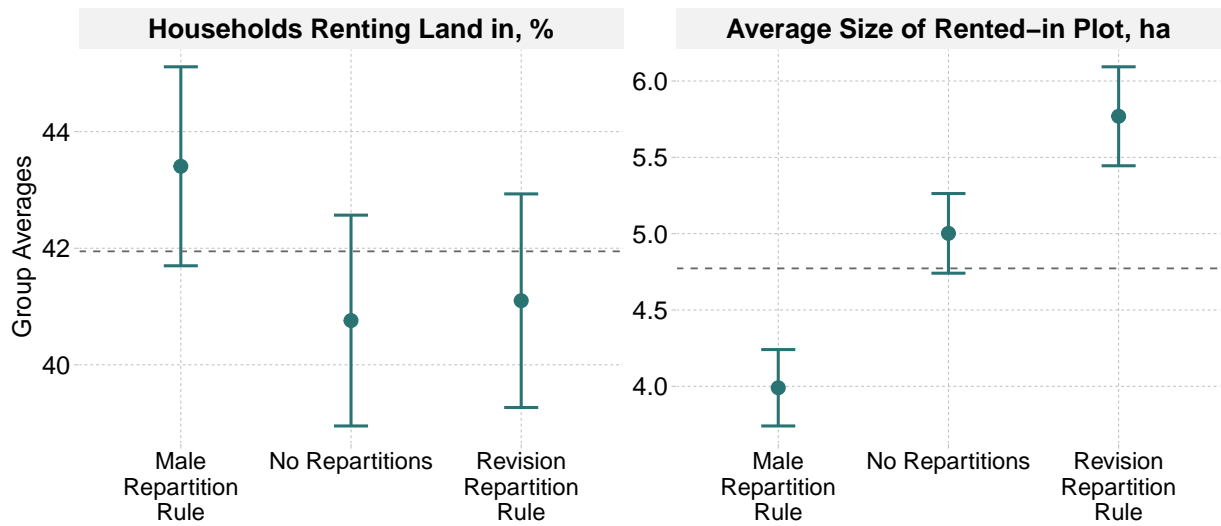


Figure 5: Rental market in Simbirsk province

Notes: Averages with 95% confidence intervals grouped by a land repartition rule across the communes of Simbirsk province. The dashed gray line represents the sample averages of 42% for the percentage of household renting land in and 4.77 ha for the average area of a land plot rented in on the entire sample. For the left panel, the sample consists of 2,514 observations, and for the right panel of 2,413 — excluding communes with zero rented-in land.

province, Nafziger (2016) has documented that peasants often resorted to small-scale rental transactions to adjust land allocation between major repartitions. Peasants in communes without active repartitioning, however, had no choice but to rely on land rentals. This suggests that the extent of rental market participation could serve as an indicator of the efficiency of communal institutions in managing land allocation. If labor-contingent repartitioning functioned relatively well in substituting for a formal land market, one would expect communes employing a male repartition rule to rely less on the rental market compared to other types of communes, holding other factors, such as land endowment and incomes, constant.

Figure 5 shows unconditional differences in the average level of rental market participation across three groups of communes. Land rentals were relatively widespread in Simbirsk province. On average, 42% of households reported having rented some land in, with group averages statistically indistinguishable from the province average.³¹ At the same time, there are considerable differences in *how much land* was rented in across the three groups. Communes with a male repartition rule rented in the smallest plots, with an average size of 4 hectares (or 9.8 acres) — supporting the idea that rental transactions served as a tool for implementing marginal adjustments to land allocation between repartitions. In contrast, communes with a revision repartition rule rented in the largest plots, with an average size of around 6 hectares (or 14.8 acres).

It appears that communes that did not end up adopting a male repartition rule resorted to land rentals in order to mitigate inefficiencies in land allocation. Peasants in these communes not only rented in more land on average, but also rented more land than they were allotted by the commune, with the ratio of the average communal plot to the average rented-in plot being approximately 1.1. In contrast, in communes with a male repartition rule, the average rented-in plot was smaller than the average communal plot, with the ratio amounting to around 0.69.

³¹Only 4% of all communes in Simbirsk province had no rented-in land.

These differences, however, could also have been driven by other factors, such as land endowment or soil quality. To account for this, I estimate a regression controlling for the logarithms of total communal land and labor endowments, the average size of a family plot, the shares of migrants and households without working males, a dummy variable for fertile chernozem soil, average ruggedness, and the share of forest landcover to account for soil quality, and the distance to the nearest railroad to approximate land prices. As a dependent variable, I use the logarithm of the average size of a rented-in plot, since the distribution of this variable is highly right-skewed, as demonstrated in Figure B.9 in the Appendix.

Table A.8 in the Appendix reports the results. The coefficient on *Male Repartition Rule* remains negative and highly significant across all the specification. Although the coefficient on *No repartitions* is also negative and significant in the baseline specification reported in Column (1), its magnitude decreases, and it loses significance once control variables are included. These results suggest that labor-contingent repartitions were more successful in mitigating land misallocation than all other communal arrangements. According to the estimates reported in Column (4), the average rented-in plot size was 13% smaller in communes employing a male repartition rule compared to all other communes.

Therefore, it appears that labor-contingent repartitions and rentals offered fundamentally different solutions to the problem of land allocation. Peasants living in communes that did not employ a male repartition rule had to engage in the rental market, which presumably made the transition to formalized private property under the reform of 1906 less costly. In contrast, communes that used a male repartition rule managed to partially overcome the problem of the absence of the well-functioning land market.

7.2 Land Access

As argued in Section 5.2, labor-contingent repartitioning evolved in response to uneven and abrupt demographic shocks. By accounting for family structure, this system likely generated lower inequalities in land distribution across households than other communal arrangements, thereby further diminishing the benefits of land titling for peasants. However, improved access to land has been shown to inefficiently retain labor in agriculture (Zhao, 2020). In this section, I examine whether the adoption of a male repartition rule was associated with a lower share of landless households.

As the outcome variable, I use the percentage of households that were not allotted any communal land in the most recent repartition. The set of controls follows that used in Section 7.1. I include the logarithms of communal land area and population and the average size of a family plot. I further control for the shares of migrant households and households with no working males, as communes often redistributed the land of migrants and widows among resident households. Additional controls include a dummy for chernozem soil, average terrain ruggedness, the share of forest land cover, and the distance the nearest railroad.

Table A.9 in the Appendix reports the results. Across all specifications, the coefficient on *Male Repartition Rule* is negative and highly significant, whereas the coefficient on *No Repartitions* loses significance once the full set of controls is included. In the full specification, reported in Column (4), the share of households without communal land was approximately 6 percentage points lower in communes that employed a male repartition rule compared to all other types of communes. In terms of real measures, the coefficient roughly corresponds to the difference between the 10% percentile of the outcome variable's distribution, which is equal to 0%, and the 40% percentile, which is equal to around 7%.

Even though I cannot directly examine differences in land distribution across households in

with different repartition rules due to the absence of commune-level data, the results suggest that communes employing a male repartition rule did provide their members with better access to land, likely making peasants more reluctant to give it up under the reform of 1906. However, by keeping labor in agriculture, labor-contingent repartitions trapped communes in a less efficient equilibrium.

8 Conclusion

Around the globe, formal institutions widely coexist and often compete with traditional institutions. In some parts of the world, modernizing reforms, such as the introduction of land titles, often face only moderate demand (Vendryes, 2014). Addressing this puzzle, scholars have focused on the nature of formal institutions, suggesting that individuals are more likely to prefer traditional institutions when the alternative is a weak or corrupt state, or when the state might threaten the customary privileges enforced by traditional institutions (Honig, 2017; Lazarev, 2019; Winters and Conroy-Krutz, 2021). In this paper, relying on the historical case of the 1906 land titling reform in the Russian Empire, I argue that the success of modernizing reforms depends on the nature of pre-existing traditional institutions and their performance relative to the alternative being offered.

Prior to the reform, agricultural land in the Russian Empire was owned collectively by the institution of peasant commune and, in some regions, legally subject to periodic reallocation across households, restricting labor mobility and discouraging investment in land improvement. The reform provided peasants with a legal right to title land plots they were farming, securing land from a future reallocation and enabling peasants to collateralize or sell their land. Relying on newly digitized commune-level data from the province of Simbirsk in the southeastern part of European Russia in 1910–11, I uncover dramatic variation in the structure of traditional institutions that governed landownership. Communes that practiced land reallocation differed with respect to a reallocation rule they employed, whereas around one third of all communes did not conduct land reallocations at all.

I find that the demand for the land reform was lowest in the communes where land reallocations acted as a substitute for factor markets. Different approaches to land allocation created opposing incentive structures, which, in turn, implied differential benefits and costs associated with transitioning to formalized property rights. I document that communes which reallocated land based on the number of working family members relied less on the rental market compared to other types of communes, holding factors such as land endowment and incomes equal. They also had the lowest share of households with no access to communal land.

This suggests that labor-contingent allocation effectively substituted for a formal land market. This substitution proved especially important in the times of demographic shocks and economic uncertainty. Lending support to this explanation, Dower and Markevich (2018a) find that mass mobilization during the World War I affected agricultural production on communal land to a lesser extent than on private farms. When communal arrangements fell short of the market mechanisms, the demand for land titling increased.

When deciding upon land titling, peasants weighed benefits of a new institutional arrangement against the costs of losing access to the old one. Holding constant the availability of non-agricultural employment, both the benefits and costs of acquiring a land title seem low in communes with land-contingent land reallocations. In such communes, peasants could have potentially derived high benefits from securing land against future reallocation by acquiring a title. This, however, would entail a high cost of giving up access to the mechanism

that corrected for land misallocation and ensured access to land for its members. Communes that practiced land reallocations but did not adjust land holdings for family structure, in contrast, did not substitute for a formal market but still imposed an expropriation threat, making benefits of land titling outweigh its costs.

Disregarding local institutional contexts when designing and implementing modernizing reforms can lead to unexpected results or even misleading conclusions when assessing their success. For example, in Cameroon, although a large percentage of the population did not end up claiming a formal title under the 1974 land reform, **Firmin-Sellers and Sellers (1999)** demonstrate that the reform nevertheless increased the security of farmers' property rights by invoking customary laws that regulated land tenure. Similarly, I argue that variation in the practice of land repartitioning, overlooked by the designers of the 1906 reform, conditioned peasants' incentives to claim a land title.

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Appendix

A Additional Tables

Table A.1: Translation of Historical Terms

Term in Russian	Term in English	Description
<i>Gubernia</i>	Province	Principal administrative unit in the Russian Empire
<i>Uezd</i>	District	Administrative subunit of a province
<i>Volost'</i>	Township	Administrative subunit of a district; encompassed only peasant population
<i>Obschina</i> (also <i>mir</i>)	Commune	Peasant self-government institution; usually comprised one large village or several smaller ones
<i>Selsky skhod</i>	Communal assembly	Assembly of household heads in a commune
<i>Selsky starosta</i>	Communal headman	Primary communal official
<i>Zemsky nachalnik</i>	Land captain	Governmental official responsible for interacting with peasant communes; usually oversaw multiple townships
<i>Uezdny syezd</i>	District assembly	District peasant administration overseeing land capitains
<i>Zemstvo</i>	Local self-government	Elected assembly with the power to assess taxes and allocate revenues to fund public goods; established in 1864
<i>Peredel</i>	Repartition	Redistribution of land allotments among households of a commune
<i>Dusha</i> (<i>dushi</i> , pl.)	Soul	Before the abolition of serfdom, a taxable male; afterwards, a unit of land repartition
<i>Reviziya</i>	Revision	Before the abolition of serfdom, a tax census conducted to establish the sum of per capita peasant taxes

Table A.2: Summary Statistics

Variable	Mean	Std. Dev.	Med	Min	Max	N
Titling Rates, %	17.6	24.3	5.9	0	100	2,520
Male Repartition Rule	0.4	0.5	0	0	1	2,521
No Repartitions	0.3	0.5	0	0	1	2514
Years since the Last Repartition	23.2	19.5	14	0	108	2,514
Average Allotment, ha	3.4	3	3	0.1	60.3	2,521
Average Family Size	5.6	0.9	5.5	1	12	2,521
Population, households	126.8	163.3	69	1	1270	2,521
Migrant Households, %	13.4	12.1	10.7	0	100	2,521
No Working Males, %	8.4	7.4	7.5	0	100	2,521
Literacy, %	14.8	8.1	14.7	0	73	2,521
Ethnic Russians	0.8	0.4	1	0	1	2,521
Former Serfs	0.6	0.5	1	0	1	2,521
Chernozem	0.2	0.4	0	0	1	2,521
Average Ruggedness	47.7	11.3	46.6	19.1	122	2,487
Forest Landcover, %	25.1	19.5	18.8	0	87.2	2,487
Distance to Township Center, km	7.2	5.5	6.4	0	42.7	2,500
Distance to District Town, km	51.9	27.2	49.9	0	121.1	2,487
Distance to Railroad, km	28.9	21.5	25.1	0	95.2	2,487
Households without Land, %	13.1	13.2	10	0	89.9	2,515
Average Family Plot, ha	6.3	3.6	5.9	0.2	45.5	2,521
Total Land, ha	735.3	1,124.9	320.5	1.1	11,259	2,521
Artisans, %	11.9	7.2	11.2	0	75.2	2,521
Vacant land captain office	0.2	0.4	0	0	1	2,487
Land Captains, 1907–12	1.9	0.8	2	1	3	2,487
Sentences for Peasant Unrest	0.6	3.5	0	0	31	2,521
Households Renting Land in, %	41.9	26.5	38.3	0	100	2,519
Average Size of Rented-in Plot, ha	4.8	4	4	0.2	100.5	2,420
Sold Allotments, % of Titled	14.5	26.3	0	0	100	1,779

Notes: The unit of analysis is a commune of Simbirsk province.

Table A.3: Communes by Year of Last Repartition

	(1)	(2)
	Number of communes	% of communes
No repartitions since 1861	808	32.1
1862–1871	9	0.4
1872–1881	29	1.2
1882–1891	120	4.8
1892–1901	779	30.9
1902–1911	769	30.5
Sum	2,514	99.7
Year unknown	7	0.3
Total	2,521	100

Notes: Data come from [Simbirsk Provincial Zemstvo \(1913\)](#).

Table A.4: Comparison of Communes with Post-Reform and Pre-Reform Repartitions

	(1) Pre-Reform Mean	(2) Post-Reform Mean	(3) Difference
Titling rates, %	17.79 (0.517)	16.43 (1.363)	-1.36
Male repartition rule	0.36 (0.01)	0.71 (0.023)	0.35***
Average allotment, ha	3.46 (0.069)	2.93 (0.082)	-0.54***
Average family size	5.61 (0.021)	5.45 (0.039)	-0.17***
No working males, %	8.43 (0.169)	8.27 (0.269)	-0.16
Population, households	119.37 (3.423)	167.61 (9.382)	48.24***
Migrant households, %	13.36 (0.266)	13.79 (0.557)	0.43
Literacy, %	14.89 (0.177)	14.23 (0.393)	-0.66
Ethnic Russians	0.81 (0.009)	0.71 (0.023)	-0.10***
Former serfs	0.63 (0.01)	0.56 (0.025)	-0.07***
Chernozem	0.18 (0.008)	0.10 (0.015)	-0.08***
Average ruggedness	47.69 (0.243)	47.81 (0.605)	0.12
Forest landcover, %	25.35 (0.431)	23.86 (0.958)	-1.50
Distance to district town, km	52.08 (0.597)	51.50 (1.35)	-0.58
Distance to railroad, km	28.23 (0.467)	33.05 (1.107)	4.83***
Households without land, %	13.37 (0.292)	11.51 (0.577)	-1.8***

Notes: The unit of analysis is a commune of Simbirsk province. Column (1) computes the averages on the subsample of communes that had their last repartition prior to 1907; Column (2) computes the averages on the subsample of communes that had their last repartition between 1907 and 1911. Column (3) reports the difference in means with a significance level of a t -statistic.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table A.5: Land Titling and Repartitioning Practices

	<i>Dependent variable:</i>			
	Titling Rates, %			
	(1)	(2)	(3)	(4)
Male Repartition Rule	−11.006*** (1.942)	−7.141*** (1.996)	−7.441*** (1.886)	−0.430*** (0.096)
No Repartitions	−5.247** (2.142)	−4.928** (1.985)	−4.084** (1.951)	−0.189** (0.092)
Average Allotment, ha		1.562*** (0.433)	1.437*** (0.419)	0.035*** (0.009)
Average Family Size		−0.142 (0.731)	0.302 (0.789)	0.023 (0.041)
Population, households		−0.002 (0.003)	−0.005 (0.003)	−0.0002 (0.0002)
Migrant Households, %		0.137** (0.061)	0.153** (0.065)	0.007** (0.003)
No Working Males, %		0.044 (0.082)	0.058 (0.083)	0.003 (0.004)
Literacy, %		0.156* (0.089)	0.136 (0.087)	0.007 (0.004)
Ethnic Russians		3.548* (2.009)	1.613 (2.066)	0.201 (0.149)
Former Serfs		−1.840 (1.795)	−2.628 (1.810)	−0.161* (0.084)
Chernozem		0.851 (1.655)	3.326* (1.868)	0.233** (0.110)
Average Ruggedness		−0.174*** (0.063)	−0.137* (0.075)	−0.007 (0.004)
Forest Landcover, %		−0.181*** (0.036)	−0.166*** (0.042)	−0.010*** (0.003)
Distance to Railroad, km		−0.100*** (0.032)	−0.029 (0.042)	−0.0005 (0.002)
Distance to District Town, km		−0.010 (0.025)	−0.045 (0.031)	−0.002 (0.002)
Distance to Township Center, km		−0.007 (0.112)	−0.034 (0.111)	−0.002 (0.006)
District Fixed Effects			✓	✓
Estimator	OLS	OLS	OLS	Poisson QMLE
Mean of DV	17.8	17.8	17.8	17.8
Standard deviation of DV	23.6	23.6	23.6	23.6
Observations	2,034	2,034	2,034	2,034
Adjusted R ²	0.033	0.109	0.122	

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the percentage of allotments titled by 1911. Standard errors, adjusted to spatial correlation within 10 km following [Conley \(1999\)](#), in parentheses.

*p<0.1; **p<0.05; ***p<0.01

Table A.6: Instrumenting Repartition Rule with Climatic Shocks

	(1) 50 years	(2) 25 years	(3) 10 years	(4) 5 years
<i>Panel A: First Stage</i>				
	<i>Dependent variable:</i>			
	Male Repartition Rule			
Drought Intensity	0.300*** (0.068)	0.199*** (0.035)	0.050*** (0.017)	−0.007 (0.016)
Mean of DV	0.37	0.37	0.37	0.37
Standard deviation of DV	0.48	0.48	0.48	0.48
Effective F	19.64	32.40	8.73	0.18
<i>Panel B: Reduced Form</i>				
	<i>Dependent variable:</i>			
	Titling Rates, %			
Drought Intensity	−5.715 (3.956)	−3.958** (1.901)	−0.932 (0.84)	−0.292 (0.761)
Mean of DV	17.8	17.8	17.8	17.8
Standard deviation of DV	23.6	23.6	23.6	23.6
<i>Panel C: Two-Stages Least Squares</i>				
	<i>Dependent variable:</i>			
	Titling Rates, %			
Male Repartition Rule	−19.047 (13.305)	−19.935** (10.091)	−18.805 (17.908)	42.861 (129.6)
Mean of DV	17.8	17.8	17.8	17.8
Standard deviation of DV	23.6	23.6	23.6	23.6
Anderson-Rubin Test	2.11	4.39**	1.24	0.15
Anderson-Rubin CI	[−50.71; 7.03]	[−43.35; −1.37]	[−79.31; 16.3]	[−∞; ∞]
Controls	✓	✓	✓	✓
District Fixed Effects	✓	✓	✓	✓
Observations	2,034	2,034	2,034	2,034

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the percentage of allotments titled by 1911. The set of controls includes average allotment size, average family size, communal population, the percentage of migrants, the percentage of households with no working males, literacy rates, dummy variables for former serfs, ethnic Russians, and chernozem soil, average ruggedness, the share of forest landcover, and distances to the township center, the district administrative center, and the nearest railroad. Standard errors clustered at the village level in parentheses. Effective F -statistic and Anderson-Rubin CI calculated using the `ivDiag` package (Lal et al., 2024).

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table A.7: Robustness to Alternative Explanations

	<i>Dependent variable:</i>			
	Titling Rates, %			
	(1)	(2)	(3)	(4)
Male repartition rule	−7.310*** (1.881)	−7.441*** (1.895)	−7.930*** (1.887)	−7.609*** (1.874)
No repartitions	−3.975** (1.948)	−4.117** (1.957)	−3.685* (1.945)	−3.922** (1.938)
Vacant land captain office, 1907–12	−2.945* (1.540)			
Two land captains, 1907–12		1.482 (1.672)		
Three land captains, 1907–12		−4.425** (1.829)		
Log Sentences, 1906–11			−1.706*** (0.414)	
Log Sentences for peasant unrest, 1906–11				−1.354** (0.542)
Controls	✓	✓	✓	✓
District Fixed Effects	✓	✓	✓	✓
Mean of DV	17.8	17.8	17.8	17.8
Standard deviation of DV	23.6	23.6	23.6	23.6
Observations	2,034	2,034	2,034	2,034
Adjusted R ²	0.124	0.128	0.132	0.124

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the percentage of allotments titled by 1911. The set of controls includes average allotment size, average family size, communal population, the percentage of migrants, the percentage of households with no working males, literacy rates, dummy variables for former serfs, ethnic Russians, and chernozem soil, average ruggedness, the share of forest landcover, and distances to the township center, the district administrative center, and the nearest railroad. Both Sentences and Sentences for peasant unrest variables are measured at the level of villages and normalized by the village population. Standard errors adjusted to spatial correlation within 10 km following [Conley \(1999\)](#) in parentheses.

*p<0.1; **p<0.05; ***p<0.01

Table A.8: Rental Market and Repartitioning Practices

	<i>Dependent variable:</i>			
	Log Average Size of Rented-in Plot, ha			
	(1)	(2)	(3)	(4)
Male Repartition Rule	−0.446*** (0.053)	−0.371*** (0.052)	−0.257*** (0.046)	−0.142*** (0.045)
No Repartitions	−0.166*** (0.048)	−0.151*** (0.046)	−0.104** (0.046)	0.010 (0.046)
Log Total Land, ha		−0.310*** (0.054)	−0.291*** (0.053)	−0.240*** (0.048)
Log Population		0.301*** (0.060)	0.285*** (0.058)	0.229*** (0.053)
Average Family Plot, ha		0.074*** (0.011)	0.064*** (0.010)	0.051*** (0.009)
Migrants, %			0.010*** (0.002)	0.007*** (0.001)
No Working Males, %			0.007*** (0.002)	0.005** (0.002)
Chernozem			−0.067 (0.051)	0.090* (0.053)
Average Ruggedness			0.001 (0.001)	−0.001 (0.002)
Forest Landcover, %			−0.003*** (0.001)	−0.003*** (0.001)
Distance to Railroad, km			−0.005*** (0.001)	−0.002* (0.001)
District Fixed Effects				✓
Mean of dependent variable	1.34	1.34	1.34	1.34
SD of dependent variable	0.69	0.69	0.69	0.69
Observations	2,338	2,338	2,338	2,338
Adjusted R ²	0.072	0.111	0.175	0.220

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the average size of a rented-in plot per household in 1911. The sample excludes communes with zero rented-in land. Standard errors, adjusted to spatial correlation within 10 km following [Conley \(1999\)](#), in parentheses.

*p<0.1; **p<0.05; ***p<0.01

Table A.9: Land Access and Repartitioning Practices

	<i>Dependent variable:</i>			
	Households without Land, %			
	(1)	(2)	(3)	(4)
Male Repartition Rule	−12.726*** (0.868)	−9.943*** (0.855)	−7.181*** (0.711)	−5.829*** (0.704)
No Repartitions	−1.814* (1.028)	−2.523*** (0.876)	−1.675** (0.747)	−0.321 (0.756)
Log Total Land, ha		−14.591*** (1.246)	−14.484*** (1.230)	−14.058*** (1.235)
Log Population		14.548*** (1.238)	14.937*** (1.248)	14.487*** (1.254)
Average Family Plot, ha		2.291*** (0.250)	2.152*** (0.234)	1.989*** (0.226)
Migrants, %			0.407*** (0.031)	0.385*** (0.033)
No Working Males, %			0.233*** (0.049)	0.211*** (0.047)
Chernozem			−0.310 (0.757)	1.060 (0.730)
Average Ruggedness			0.006 (0.028)	−0.019 (0.026)
Forest Landcover, %			0.066*** (0.013)	0.049*** (0.013)
Distance to Railroad, km			−0.043*** (0.013)	−0.020 (0.015)
District Fixed Effects				✓
Mean of dependent variable	13.3	13.3	13.3	13.3
SD of dependent variable	13.2	13.2	13.2	13.2
Observations	2,034	2,034	2,034	2,034
Adjusted R ²	0.184	0.340	0.499	0.518

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the share of households that did not have any allotted land in 1911. Standard errors, adjusted to spatial correlation within 10 km following [Conley \(1999\)](#), in parentheses.

*p<0.1; **p<0.05; ***p<0.01

B Additional Figures



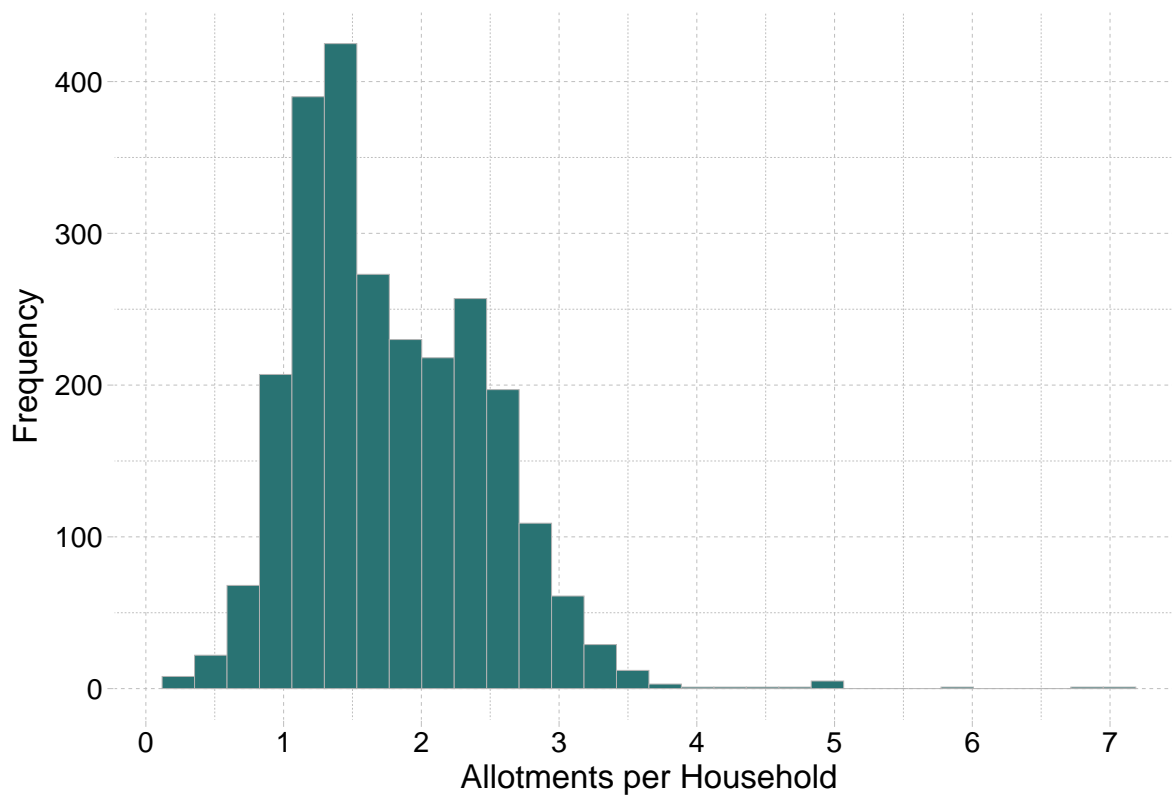
Figure B.1: Simbirsk province within the Russian Empire

Notes: Map shows the boundaries of 50 provinces in the European part of the Russian Empire. Black triangles denote St. Petersburg, the capital of the Russian Empire, Moscow, the second biggest city, and Simbirsk, the provincial center of Simbirsk province. Simbirsk province colored with yellow.

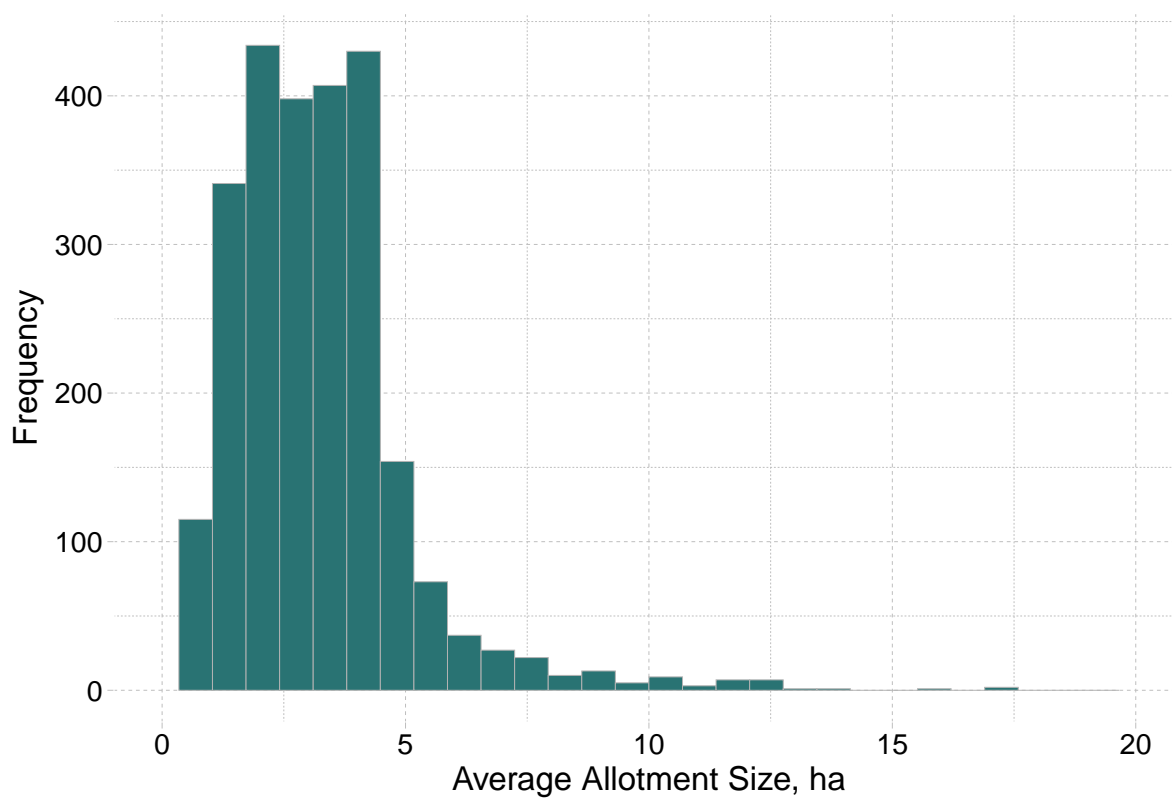


Figure B.2: Percentage of communes under repartitional land tenure in 1905
across provinces of the Russian Empire

Notes: Data on the percentage of repartitional communes among all communes across provinces of the Russian Empire come from [Central Statistical Committee \(1907\)](#). Black triangles show St. Petersburg, the capital of the Russian Empire, Moscow, the second biggest city, and Simbirsk, the administrative center of Simbirsk province.

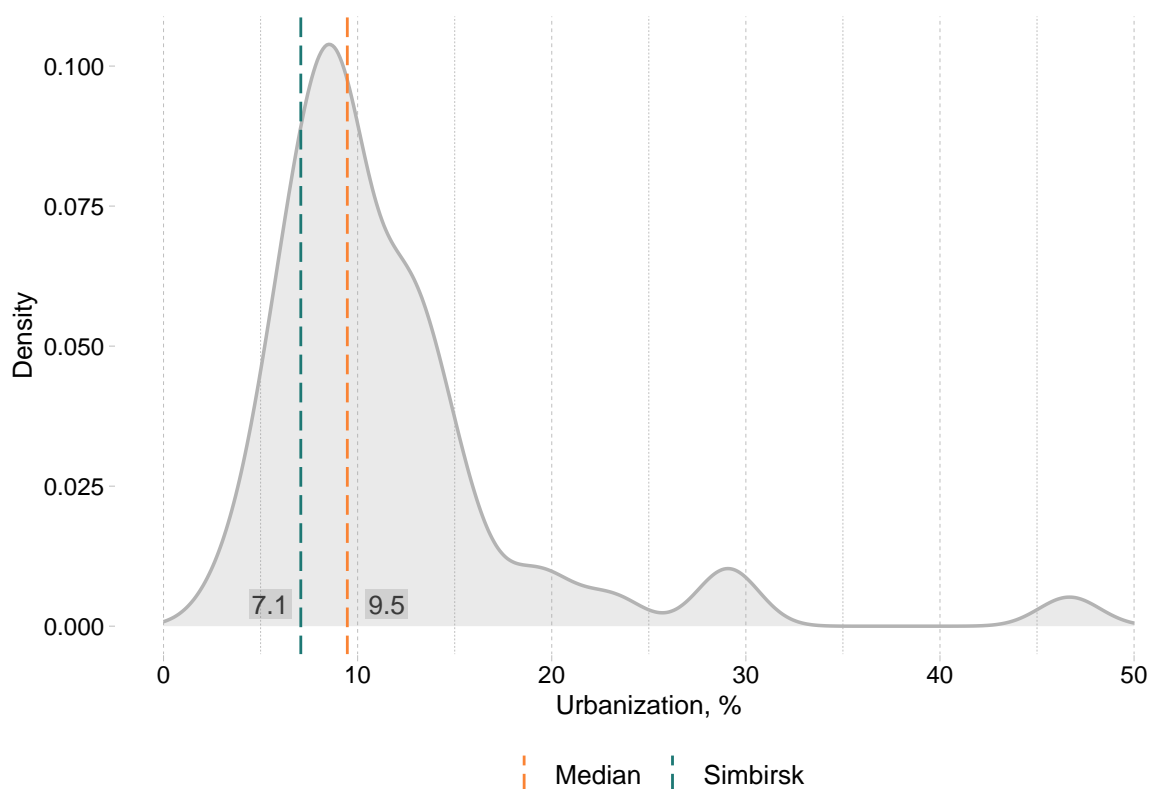


(a) Average number of allotments assigned to a peasant family

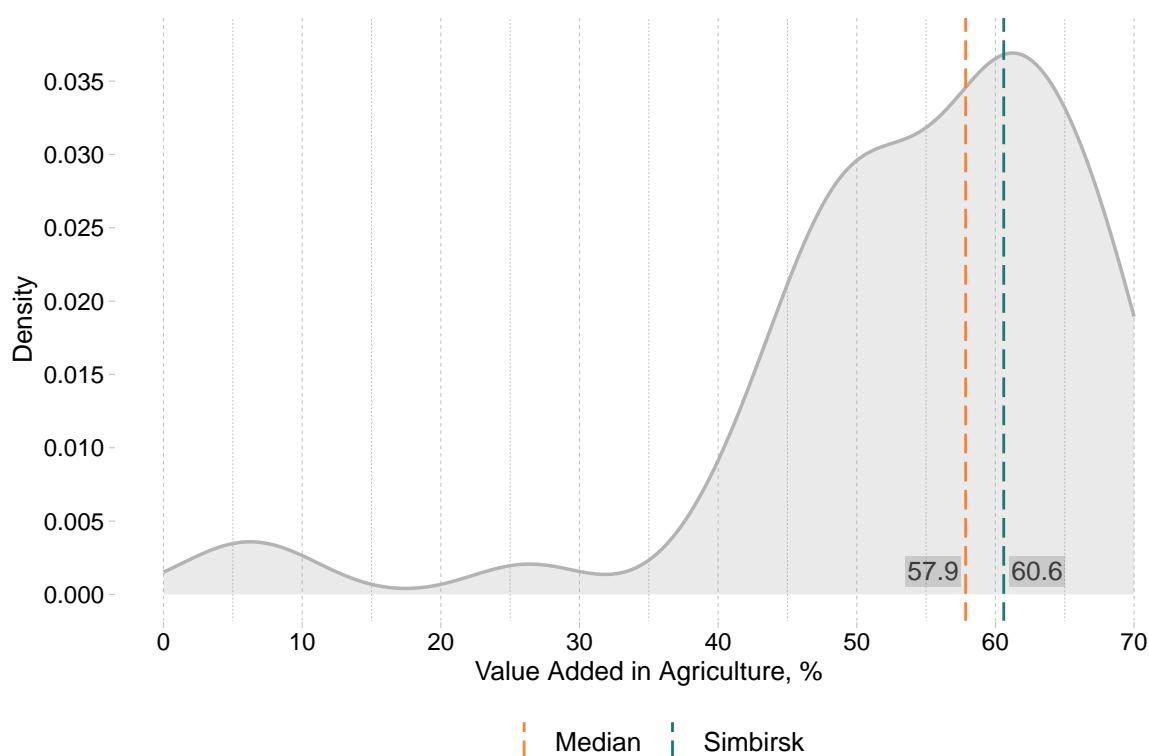


(b) Average allotment size per peasant family

Figure B.3: Peasant allotments across communes of Simbirsk province in 1910–11



(a) Urbanization rates in 1897



Source: Markevich (2019)

(b) Share of value added in agriculture in 1897 from Markevich (2019)

Figure B.4: Comparison between Simbirsk province and the Russian Empire

Notes: Figure demonstrates the distributions of urbanization rates and the agricultural sector sizes in 1897 across the provinces of the Russian Empire. Orange dashed line represents the median value across the entire sample. Green dashed line represents the value for Simbirsk.

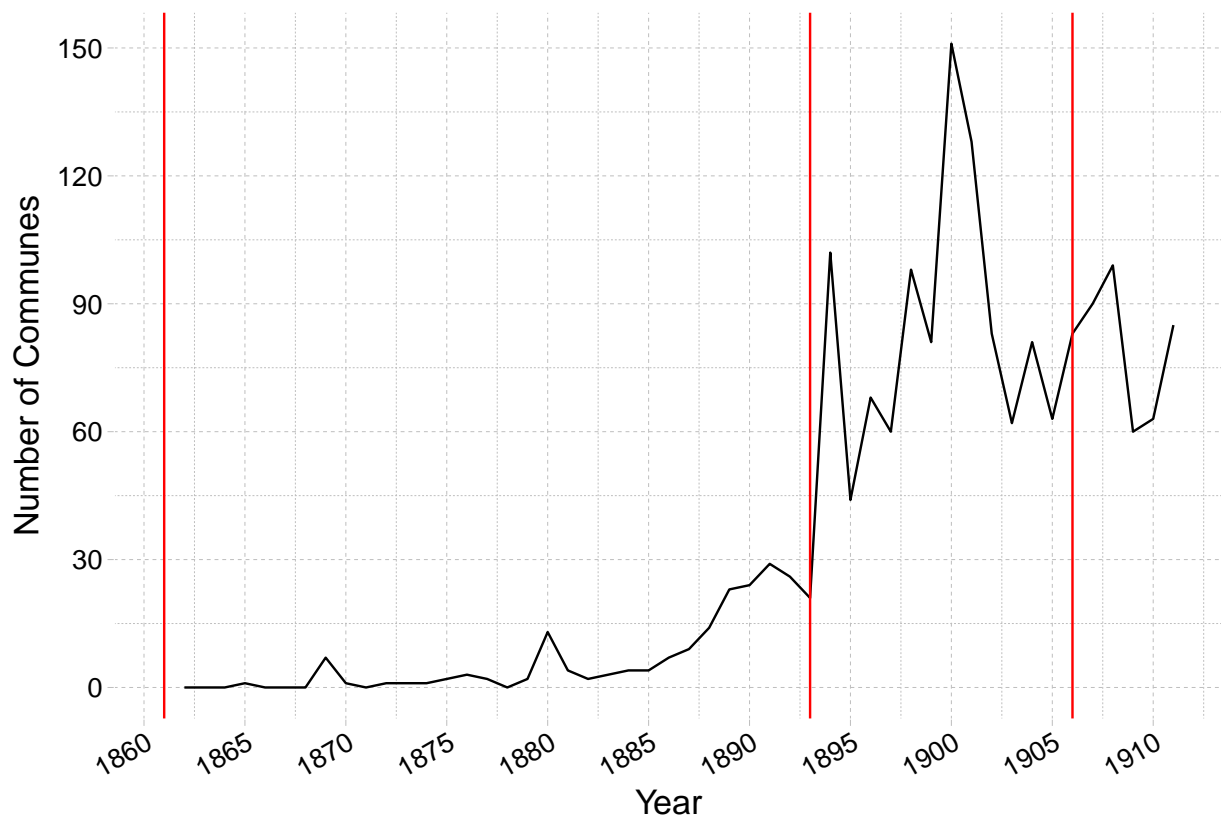


Figure B.5: Year of the last repartition

Notes: Figure demonstrates the number of communes that had their most recent repartition in a given year. Red vertical lines denote the abolition of serfdom in 1861, the peasant law of 1893, and the Stolypin reform of 1906. Note that the plot does not represent the dynamics of repartitioning; data come from a cross-section of communes collected in 1910–11.

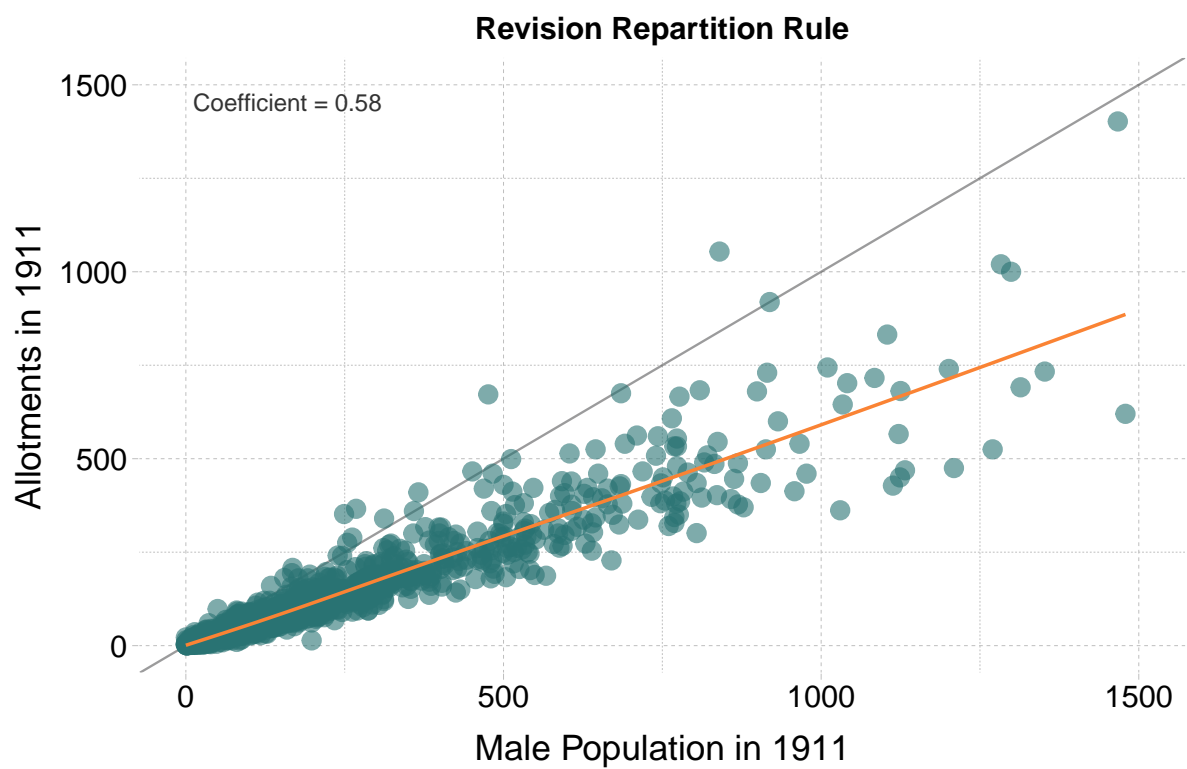
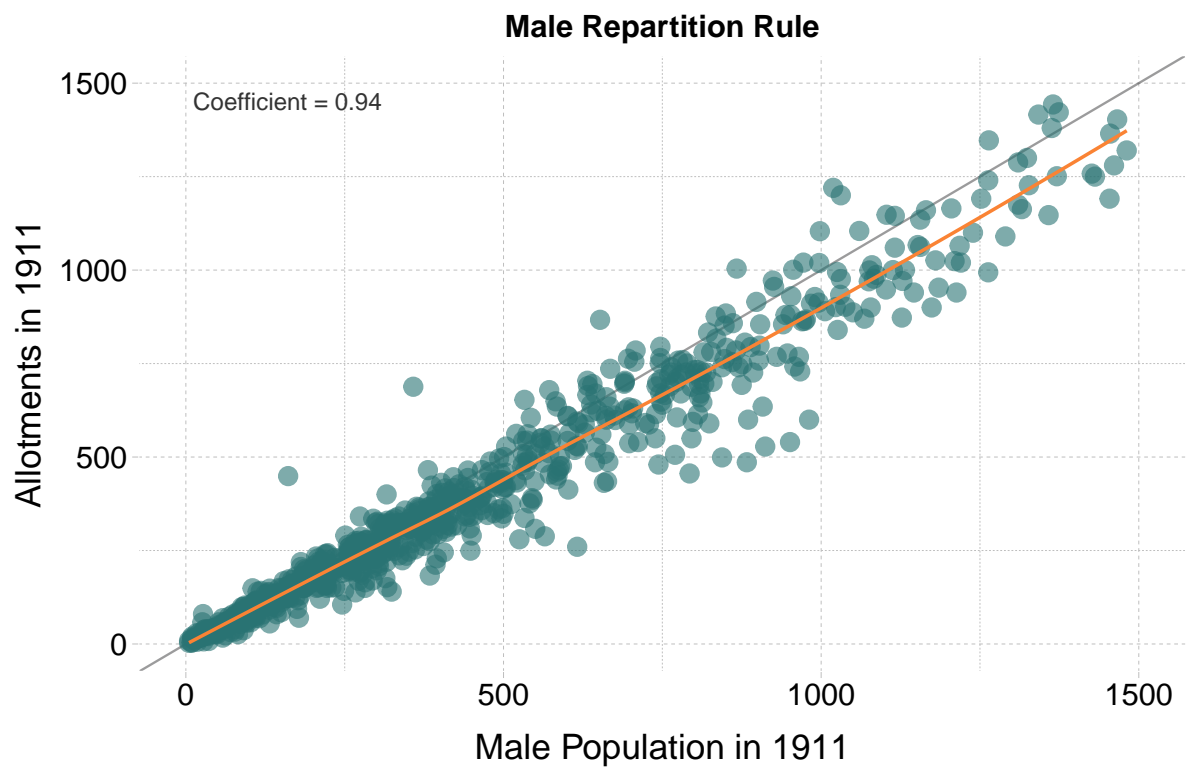
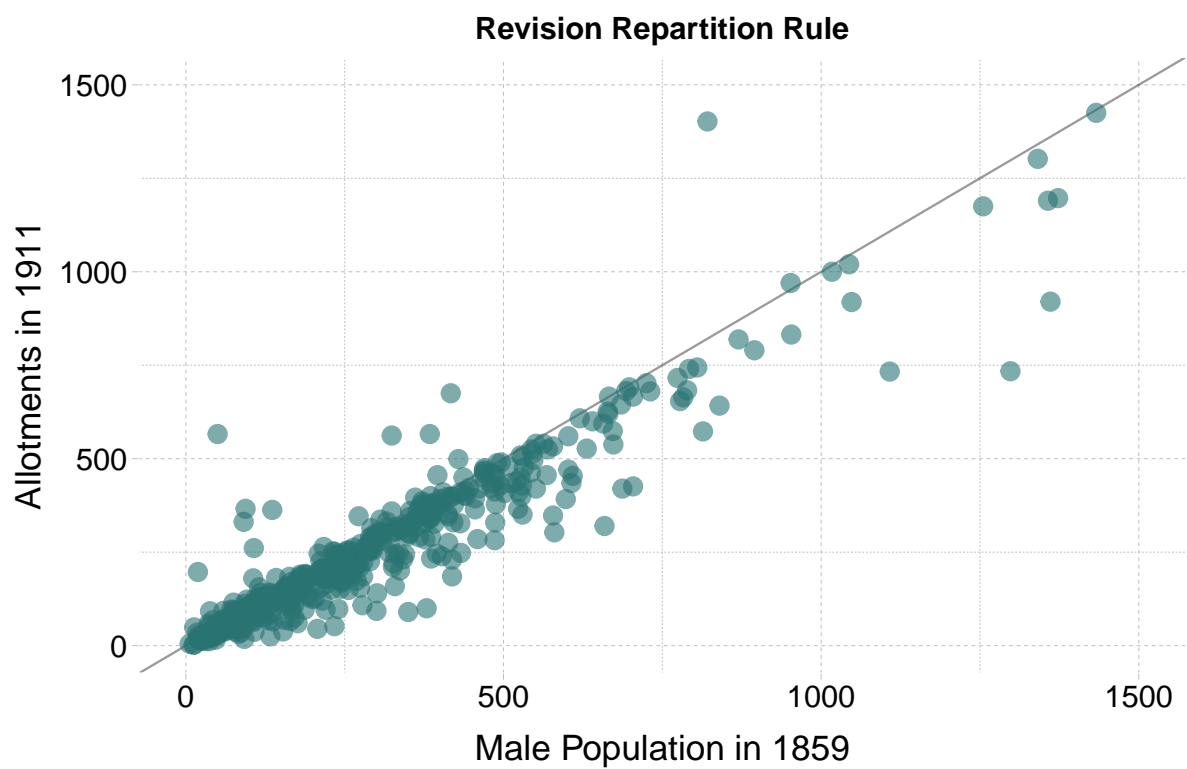


Figure B.6: Male population and the number of allotments in 1911 by repartition rule



(a) Communes that employed a male repartition rule in 1911



(b) Communes that employed a revision repartition rule in 1911

Figure B.7: Male population in 1859 and the number of allotments in 1911 by repartition rule

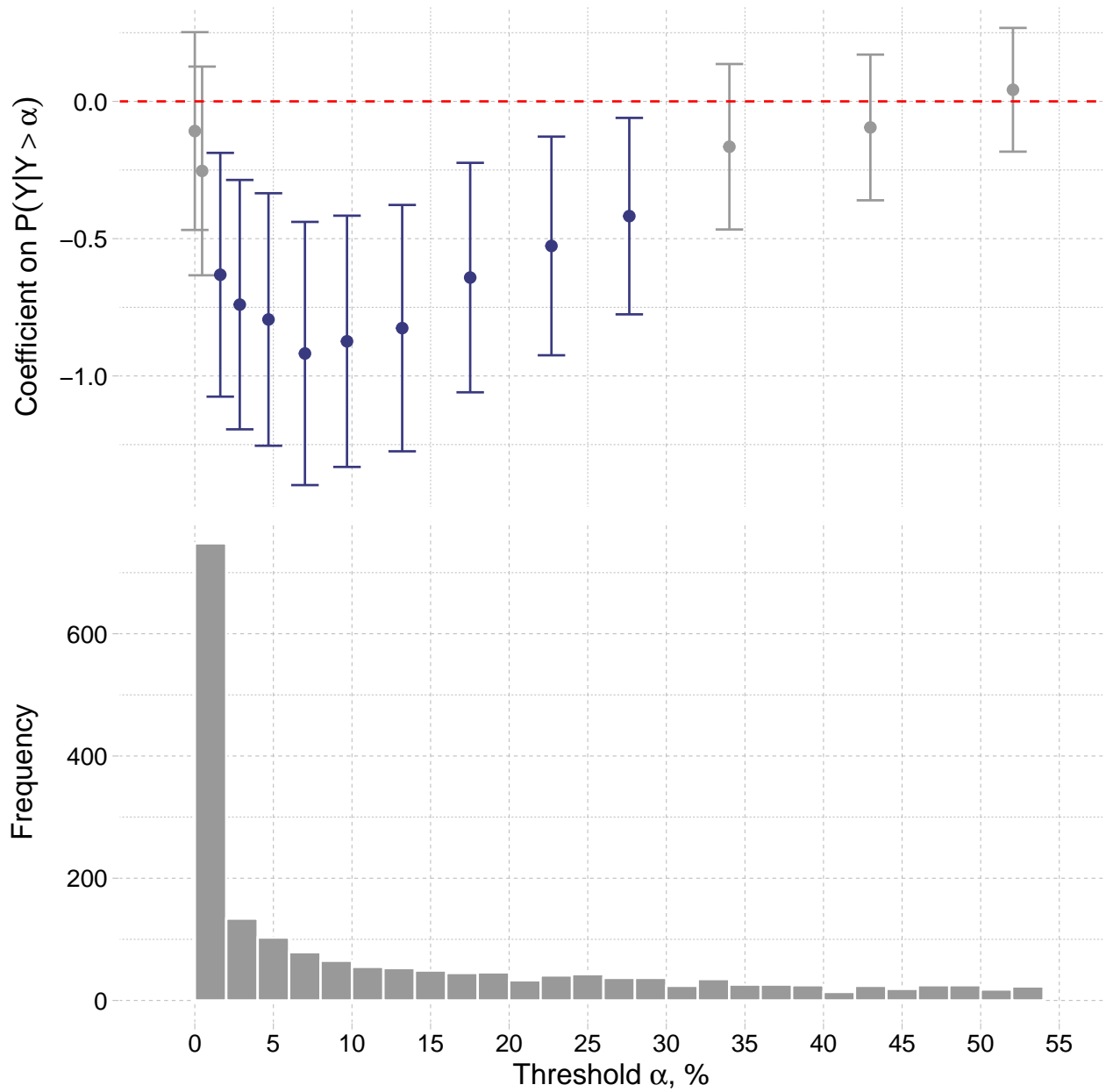


Figure B.8: Male Repartition Rule and Probability of Exceeding a Titling Rate

Notes: Figure reports the 2SLS coefficient estimates of the effect of *Male Repartition Rules*, instrumented with average drought intensity, on the probability that more than $\alpha\%$ of allotments were titled in a commune with 95% confidence intervals. The thresholds α correspond to percentiles of the titling rates distribution, ranging from the 25th percentile of 0% to the 90th percentile of 52% with a 5 percentage-point increment. Standard errors clustered at the village level.

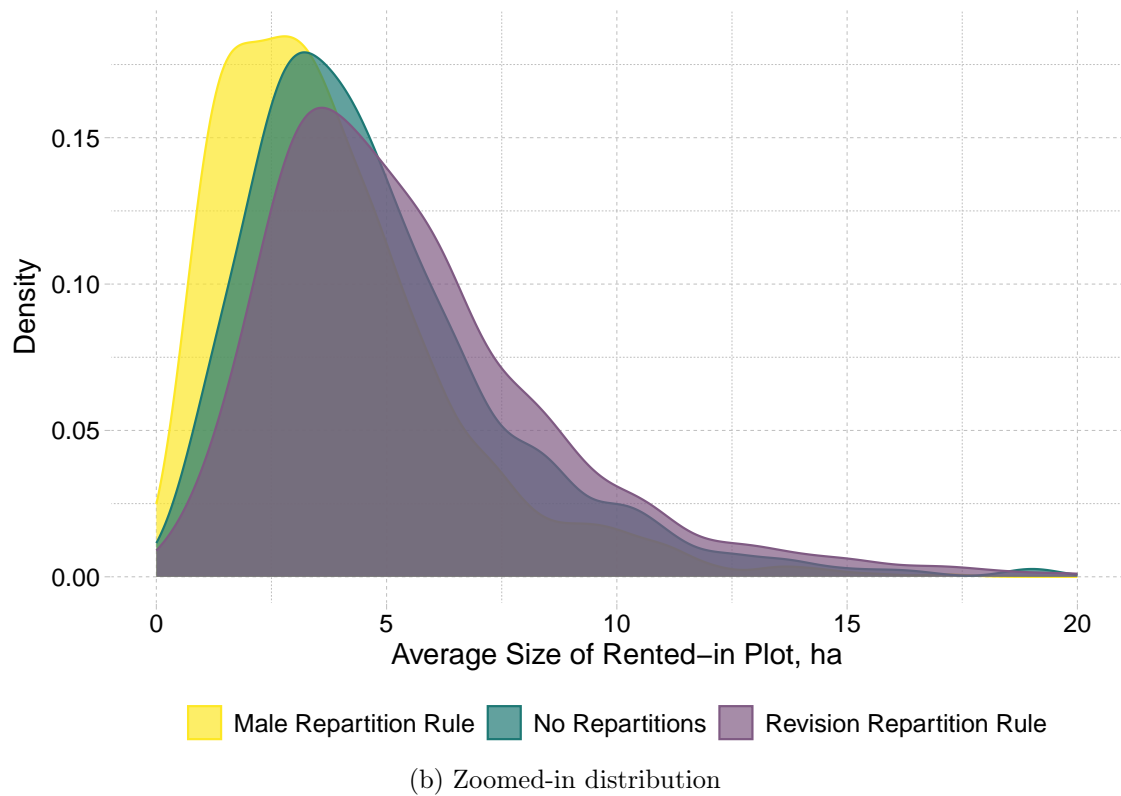


Figure B.9: Rental market in Simbirsk province

Notes: The distributions of rented-in plot sizes in hectares across the communes of Simbirsk province grouped by a land repartition rule across the communes of Simbirsk province. Panel (a) shows the entire distribution, and Panel (b) zooms in communes with rented-in plots under 20 ha (49.4 acres). The sample consists of 2,413 observations — excluding communes with zero rented-in land.

C Robustness to Spatial Dependence

According to Tobler’s first law of geography, closer objects tend to be more similar to each other than distant ones. In econometrics, spatial correlation across units may create geographic “clusters” and thereby inflate standard errors. In this section, I will assess whether spatial interdependence is present in my data and how it affects the results.

The common approach in the literature involves conducting Moran’s test for spatial interdependence in residuals. To compute the Moran’s I statistic, which relies on the correlation between a variable and its neighboring values, one must supply a neighborhood matrix. This, in turn, requires defining a distance cut-off for points to be considered neighbors. For example, when a distance of 10 km is used, all points within 10 km of point i are treated as i ’s neighbors. Below, I compute the Moran’s I statistics for different distance cut-offs ranging from 8 km – the average distance to a township center – to 30 km. Figure C.10 demonstrates that the null of no spatial autocorrelation gets rejected for all cut-offs under 25 km, indicating that spatial interdependence might be a problem for inference.

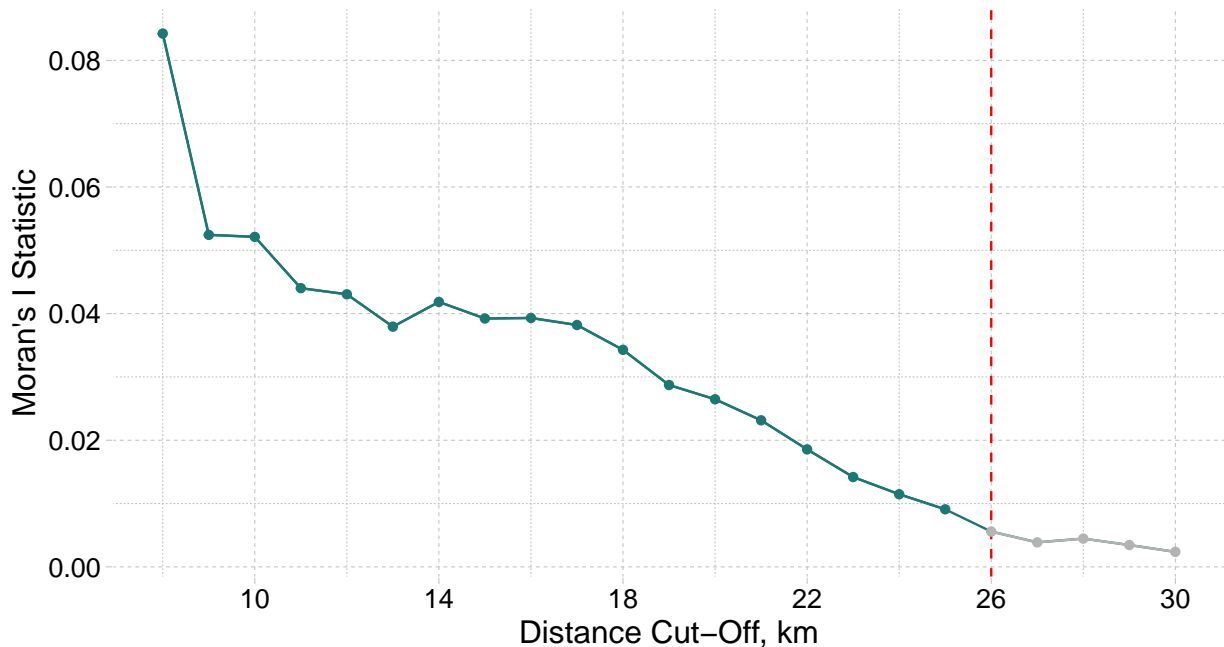
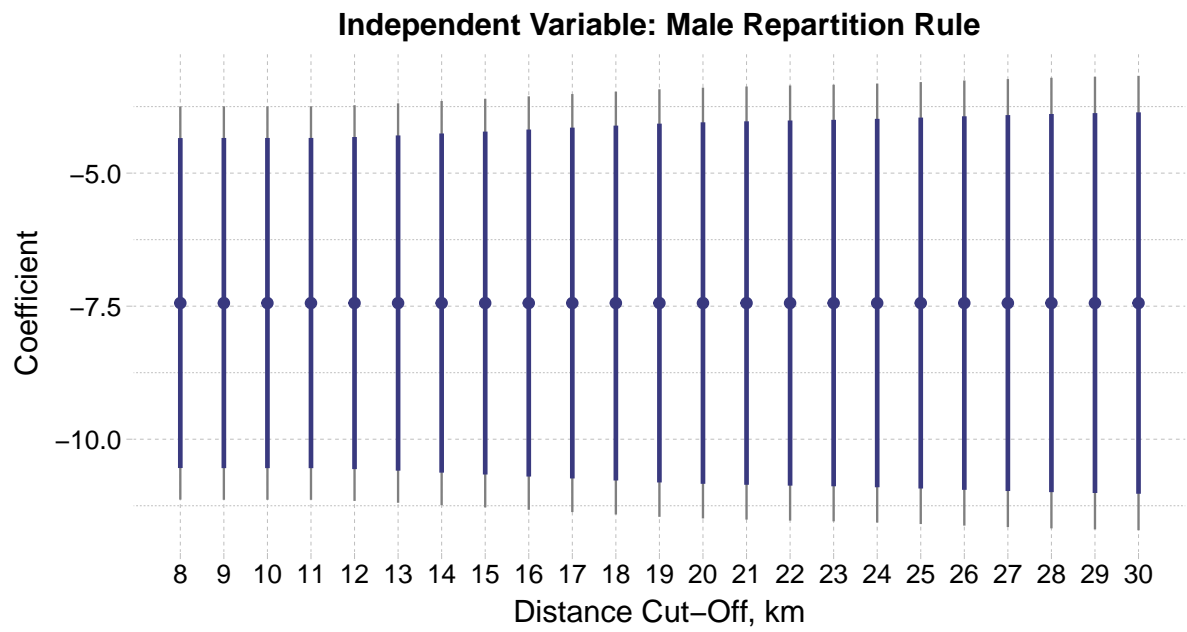


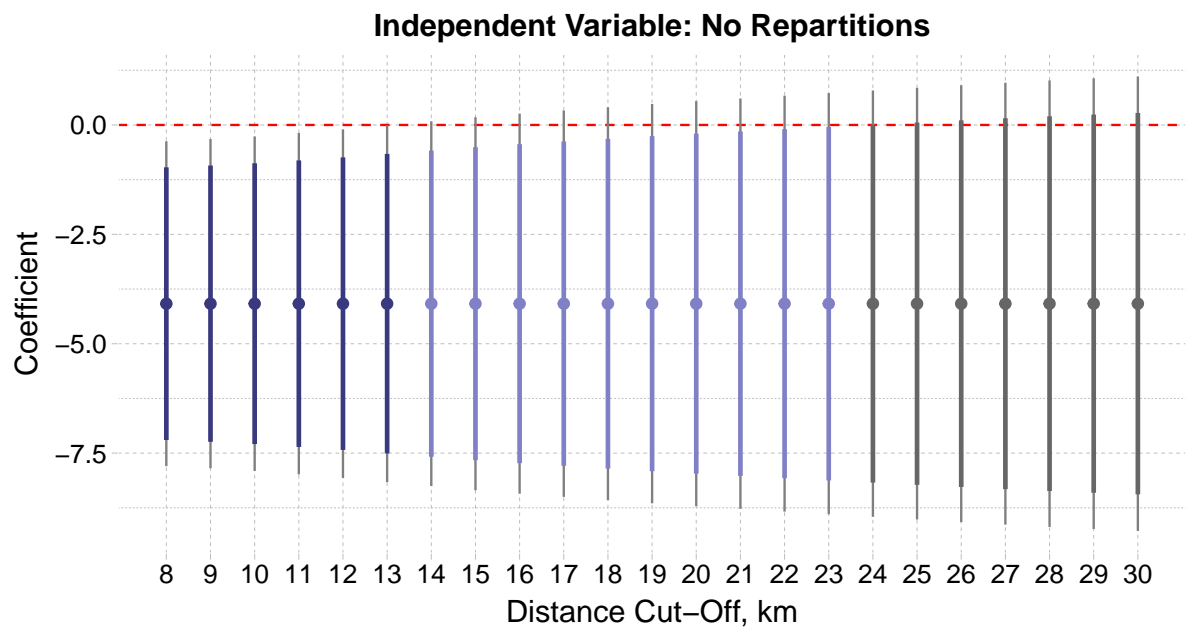
Figure C.10: Moran’s I

Notes: Figure plots Moran’s I statistic against the distance cut-off values used to compute the neighborhood matrix. For gray dots, the null hypothesis of no spatial autocorrelation cannot be rejected. Permutation inference has been used to compute p-values.

To assess the robustness of the results reported in Section 6.1, I computed standard errors adjusted to spatial autocorrelation within a radius ranging from 8 to 30 km following Conley (1999). Figures C.11a and C.11b report the set of confidence intervals for the estimated coefficients on *Male Repartition Rule* and *No Repartition* from Table 2. The coefficient *Male Repartition Rule*, the main explanatory variable of interest, remains robust to any value of the distance-cutoff. In contrast, the coefficient on *No Repartitions* is more sensitive to spatial autocorrelation, with the estimate being significant at the 10% level for distances between 14 and 24 km, and loses significance for larger distances. For comparison, the average distance to a district center is 43 km across the entire sample. Therefore, even under the most conservative standard errors, communes adopting a male repartition rule exhibit significantly lower titling rates than *all other types of communes*.



(a) Male Repartition Rule



(b) No Repartitions

Figure C.11: Inference Adjusted to Spatial Autocorrelation

Notes: Standard errors adjusted to spatial autocorrelation within a specified radius following [Conley \(1999\)](#). Coefficient estimates come from Table 2. Estimates significant at the 10% level in light purple and insignificant in gray.

D Economic Drivers of Land Titling

In this section, I discuss whether potential economic benefits from titling incentivized the participation in the reform. Figure D.12 reports the standardized coefficients from estimating Equation 1. The results suggest that titling rates were increasing with labor mobility, land availability, and more favorable climatic conditions.

First, land titling is positively and significantly associated with migration, which agrees with the recent findings by Chernina, Dower and Markevich (2014). A 10 percentage points increase in the share of migrant households is associated with a roughly 2 percentage points increase in titling rates. Although the available data do not allow me to distinguish between pre- and post-reform migrants, historical records indicate that both contributed to the demand for the reform, with earlier migrants seeking to claim and sell the land to which they were entitled and prospective migrants to accumulate resources and open a door for future migration. Table D.10 demonstrates that the share of privatized allotments sold after the start of the reform was higher in the communes with a larger migrant population.

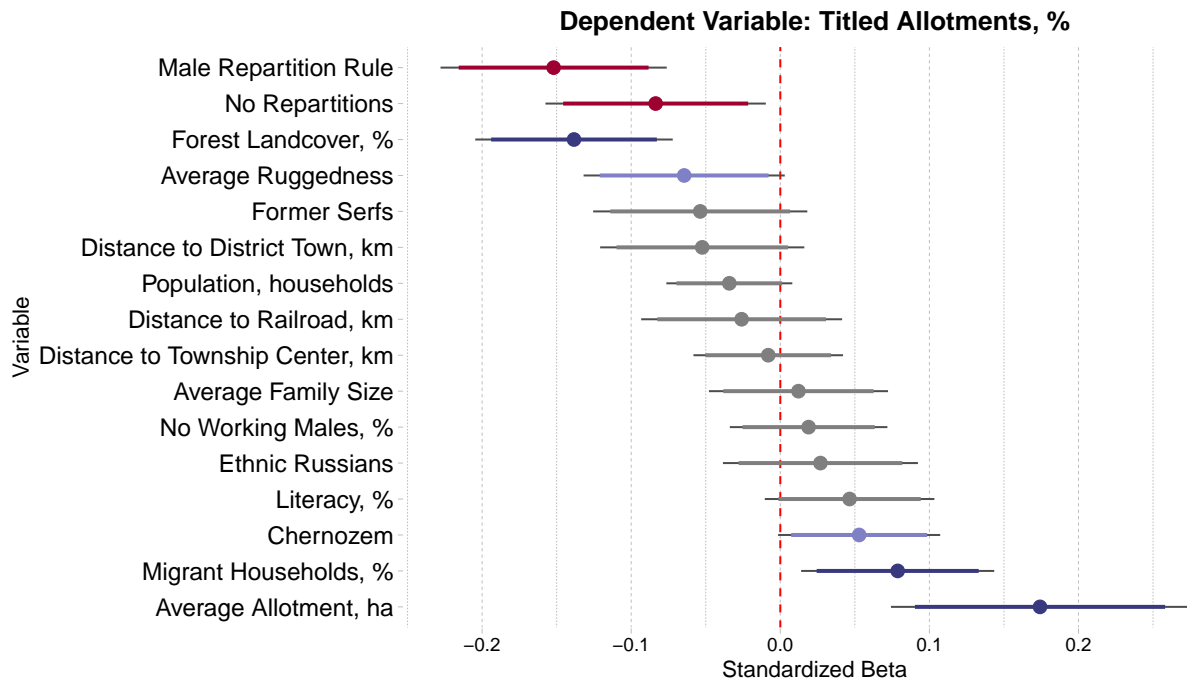


Figure D.12: Correlates of land titling in Simbirsk province

Notes: Standardized coefficients from Equation 1 with 95% and 90% confidence intervals (thick and thin lines respectively). Estimates significant at the 10% level in light purple. Standard errors adjusted to spatial correlation within 10 km following Conley (1999).

Land more suitable for agricultural production appears to have contributed to higher demand for land titling. Average allotment size is positively and strongly associated with the share of titled allotments; a one standard deviation increase in average allotment size is associated with a 4 percentage points increase in titling rates. In contrast, land that necessitated higher labor input was titled less frequently under the reform. The coefficients on *Forest Landcover* and *Average Ruggedness* are negative and statistically significant at the 1% and 10% levels, respectively. This negative association can be potentially attributed either to a higher importance of communal institutions to agricultural production in harsher environmental conditions or lower land prices. Finally, the coefficient on *Chernozem*, a dummy variable indicating the presence of the region's most fertile soil type, is positive and significant at the 10% level.

Table D.10: Land Sales and Migration

	<i>Dependent variable:</i>			
	Sold Allotments, %			
	(1)	(2)	(3)	(4)
Migrant Households, %	0.552*** (0.082)	0.551*** (0.082)	0.562*** (0.082)	0.431*** (0.079)
Literacy, %		0.215** (0.099)	0.207** (0.103)	0.234** (0.100)
Chernozem			4.087** (1.978)	6.030*** (2.233)
Average Ruggedness			0.038 (0.084)	−0.036 (0.076)
Forest Landcover, %			0.050 (0.043)	0.098** (0.045)
Distance to Railroad, km			−0.003 (0.046)	0.050 (0.051)
Titling Rates, %	✓	✓	✓	✓
District Fixed Effects				✓
Mean of dependent variable	14.6	14.6	14.6	14.6
SD of dependent variable	26.2	26.2	26.2	26.2
Observations	1,746	1,746	1,746	1,746
Adjusted R ²	0.071	0.074	0.076	0.106

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the share of titled allotments sold by 1911. Standard errors adjusted to spatial correlation within 10 km following [Conley \(1999\)](#) in parentheses.

*p<0.1; **p<0.05; ***p<0.01

E Titling Rates and a Threat of Redistribution

In this section, I examine the mechanisms underlying the negative association between the absence of repartitioning and lower demand for formal titles. The timing of the next repartition was largely unknown to individual peasants, introducing uncertainty about their land tenure. Even in communes that did not conduct a single repartition over fifty years, repartitioning remained a legal — though unlikely — possibility. In this way, longer tenure could indicate both increased and decreased tenure security from the peasant’s perspective (Jacoby et al., 2002).

To overcome this ambiguity, I take advantage of the 1893 law that restricted the frequency of repartitions to a minimum of twelve years and study whether titling rates were increasing around the twelve-year threshold. Comparing two communes — one that conducted a repartition four years ago and another fourteen years ago — we might expect that peasants in the latter would face a much higher perceived risk of land redistribution, as a new repartition could occur at any moment. If peasants anticipated an imminent repartition, they might have had stronger incentives to acquire land titles sooner rather than later. To illustrate the logic behind the empirical exercise that follows, Figure E.13 shows an unconditional scatter plot between the year of the most recent repartition and titling rates. The plot suggests that the share of titled allotments increases as communes approach the twelve-years threshold.

To test for this mechanism, I estimate the following equation:

$$\begin{aligned} \text{Titling Rates, } \%_{ij} = & \gamma_0 + \gamma_1 \text{Years since the Last Repartition}_{ij} + \\ & \gamma_2 \text{Less than } t \text{ Years Ago}_{ij} + \\ & \gamma_3 \text{Interaction}_{ij} + \mathbf{X}\boldsymbol{\Gamma} + \mu_j + \nu_{ij}, \quad (2) \end{aligned}$$

I first compute the difference, in years, between the year of the last repartition and 1911, which I denote as *Years since the Last Repartition*. Smaller values of the variable indicate that a commune conducted a repartition more recently. I then construct a dummy variable, *Less than t Years Ago*, that takes on a value of one if *Years since the Last Repartition* does not exceed t . When $t = 12$, *Less than t Years Ago* indicates whether a commune already acquired a legal right to conduct a new repartition and could potentially hold it at any moment. If the variable equals one, it means that commune did not yet cross the threshold and could not conduct a new repartition under the 1893 law.

If peasants did in fact perceived repartitions as a redistribution threat, titling rates can be expected to increase around the twelve-year threshold and decrease in both directions away from it. The interaction between the two variables allows the effect of time on titling rates to change around the threshold. The average marginal effect for the communes that did not yet cross the threshold (*Less than t Years Ago* = 1) must be negative, and for the communes that did positive. As a placebo test, I examine the alternative values of t . The set of controls \mathbf{X} follows Equation 1.

Table E.11 presents the results from estimating Equation 2. The first row reports the average marginal effect of time elapsed since the most recent repartition for communes that had conducted their last repartition more than twelve years ago, and the second row for communes that had conducted their last repartition less than twelve years ago. Column (1) employs the twelve-year threshold introduced by the 1893 law, whereas Columns (2) uses the threshold of $t = 8$ as a placebo test.

For communes that had conducted their last repartition more than twelve years ago, titling rates are increasing when communes approach the twelve-year threshold. The further a

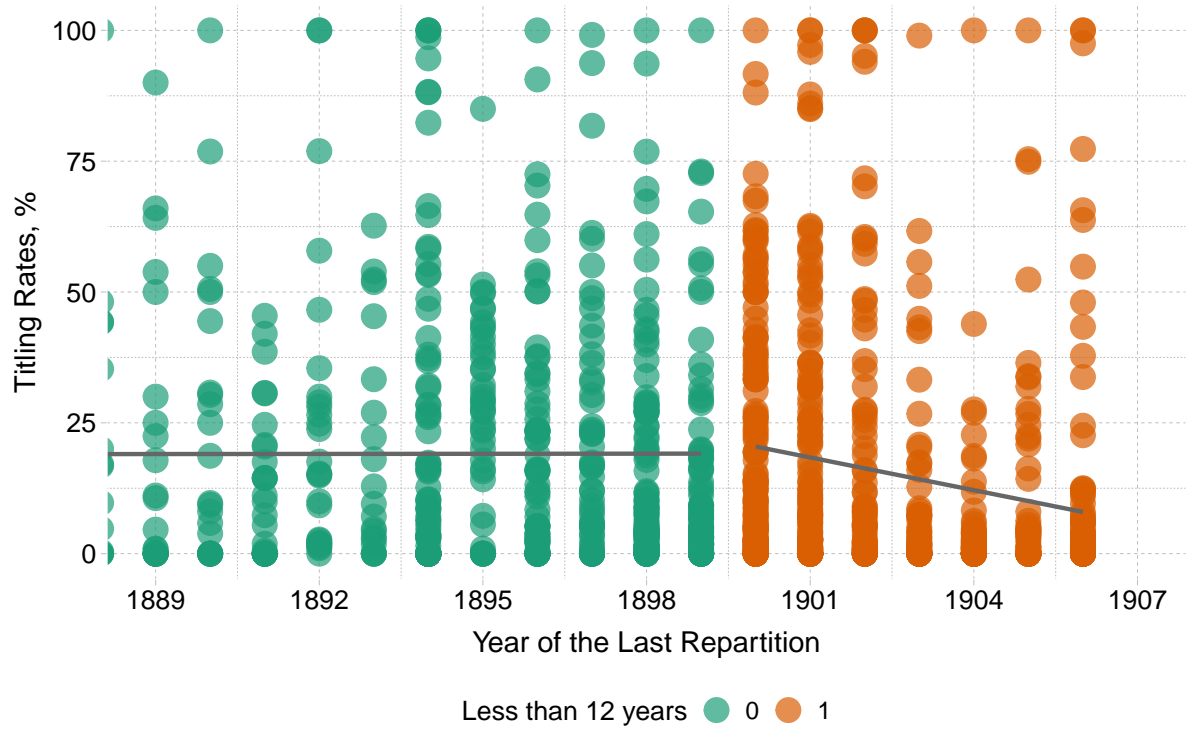


Figure E.13: Titling Rates and a Threat of Redistribution

Notes: Unconditional scatter plot between the share of titled allotments and the year of the last repartition. Orange dots represent communes that conducted their last repartition less than twelve years before 1911, while green dots represent those whose last repartition occurred more than twelve years earlier.

commune is from this threshold, the lower the titling rates tend to be. In contrast, for communes that had their last repartition less than twelve years, titling rates peak around the twelve-year threshold and decrease in communes with more recent repartitions. Taken together, these results suggest that the demand for land titling was lower when property rights were perceived as the most secure — either immediately after a repartition or in the communes that did not have a repartition for an extended period of time. I re-run the regressions excluding communes with annual repartitions (not reported), and the results do not change. The same patterns do not replicate, however, when I use the eight-year threshold.

Table E.11: Titling Rates and a Threat of Redistribution

	<i>Dependent variable:</i>	
	Titling Rates, %	
	$t = 12$ (1)	$t = 8$ (2)
Years since the last repartition & Last repartition <i>more</i> than t years ago	0.121** (0.058)	0.107* (0.055)
Years since the last repartition & Last repartition <i>less</i> than t years ago	-0.908** (0.442)	1.388 (1.387)
Controls	✓	✓
District fixed effects	✓	✓
Threshold Year	1899	1903
Mean of dependent variable	17.8	17.8
SD of dependent variable	23.6	23.6
Observations	2,034	2,034
Adjusted R ²	0.123	0.123

Notes: The unit of analysis is a commune of Simbirsk province. The dependent variable is the percentage of allotments titled by 1911. Standard errors adjusted to spatial correlation within 10 km following [Conley \(1999\)](#) in parentheses.

*p<0.1; **p<0.05; ***p<0.01