WORKING PAPERS

N° 125

The Deep Roots of Inequality

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Draft Date: November 2021

Abstract

This paper uses a new dataset of Japanese village censuses, 1637-1872, to measure inequality in landownership. Surprisingly, lands were relatively equally distributed, and most peasants were de-facto landowners. Further, there was no trend in wealth inequality. This contrasts with Western Europe where wealth inequality was high and increasing. To explain this, I use a linked multi-generational dataset of village censuses to study land transmissions. I find that Japanese households differed from Europeans due to widespread adoption of male heirs when reproduction failed. As non-marginal landowners almost always had an heir, lands were kept in the family. In contrast, elite English male lines failed 25% of the time leading to a highly unequal redistribution of their lands via will or marriage of heiresses. Finally, the institutional differences in adoption had roots in church policy in the 4th century and this may partially explain why Western Europe was more unequal by 1800.

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†The research leading to this article has received funding from the European Research Council under the European Union's Horizon 2020 Framework Program/ERC Grant agreement No. 725687, SMITE-Social Mobility and Inequality across Italy and Europe, 1300-1800. Yuzuru Kumon acknowledges IAST funding from the French National Research Agency (ANR) under grant ANR-17-EURE-0010 (Investissements d'Avenir program). I thank Satomi Kurosu and Hiroshi Kawaguchi for giving me access to their data.

Wealth was highly concentrated in much of Western Europe by the eve of the industrial revolution. This was due to a gradual concentration of wealth that may stem back to the 14th century (Alfani, 2015; Alfani and Ryckbosch, 2016; Alfani and Ammannati, 2017; Bengtsson et al., 2018; Alfani et al., 2020). Only the catastrophic shocks of the black death, and world wars allowed wealth inequality to decline (Piketty et al., 2006; Roine and Waldenström, 2009; Alfani, 2015; Saez and Zucman, 2016; Scheidel, 2017; Alvaredo et al., 2018). Such evidence has given rise to a narrative of inevitable wealth concentration over the very long-run in the absence of catastrophic shocks although the mechanism remains unclear (Scheidel, 2017). However, the evidence is overwhelmingly from Western societies so we cannot be sure whether this is a Western or a universal phenomenon.

This paper measures long-run inequality in landownership in pre-industrial rural Japan, 1640-1870, using new data from 586 villages. I primarily focus on the distribution of lands because it was by far the most important form of wealth in the pre-industrial context. Surprisingly, lands were highly equally distributed with an average Gini coefficient of 0.57. Furthermore, 84% of households owned some land. Japan had a society of landowning peasants. The differing methodologies and sources mean some caution is required for international comparisons. However, the most comparable village-level data from pre-industrial Italy and England show substantially higher Gini-coefficients of 0.7-0.9 (Alfani, 2015; Alfani and Ammannati, 2017; Kumon, 2021). Although less comparable, data from other Western European societies show similarly high inequality in land and other forms of wealth (Alfani and Ryckbosch, 2016; Bengtsson et al., 2018) while evidence from China suggests similarly low landownership inequality (Buck, 1937). Additionally, I find landownership inequality in Japan was steady unlike Western Europe where inequality was gradually increasing. These findings suggest a regional divergence whereby Western Europe converged towards societies of landless laborers while East Asia converged towards landowning peasant societies.

How did Japanese villages manage to keep land distributions so equal? I use linked household landownership data across multiple generations to further study how lands were being transmitted across generations. The striking finding is that very few male lines owning land were failing. This was not due to differences in fertility. The data shows child-birth was similarly unreliable in securing male heirship in pre-industrial Japanese villages or contemporary England due to high child mortality.

Instead, I find evidence that the demographic institution of adoption, which was common in East Asia but not in Western Europe, was used to secure heirship when biological reproduction failed. I first show that adoptions were causally motivated by the desire to secure a male heir by using the sex of the first child as an instrumental variable. Therefore, adoption functioned as an insurance against the uncertainties of fertility and child morality.

This contrasts with the adoptions motivated by child welfare in Western societies today. I then show household extinctions were negatively correlated with landownership. This is not driven by the gradual selling of lands by households that were planning to go extinct as I get similar results when I instrument landownership with landownership lagged by 20 years. Additionally, I show households with more than the mean amount of land almost never went extinct despite having a 20% chance of having no male biological heir. Poorer households holding marginal amounts of land did go extinct but this never composed a large share of lands. Therefore, the lands largely remained within the male-line across generations.

In contrast, the extreme rarity of adoptions in Western Europe greatly increased household extinctions. For instance, the male lines of the English elite went extinct at least 25% per generation, 1200-1800.[1] A consequence of high extinction rates was that social institutions, such as wills or marriages by heiresses, had a large impact on land distributions (Habakkuk, 1994). These institutions tended to redistribute lands highly unequally, usually to a few households who already had their own lands, leading to land concentration. One illustrative example comes from the Earls Cowper in the 18th century who went from modest landowners to real affluence due to the first two earls marrying women who became heiresses (Clay, 1968). Given the large number of male line extinctions in England, land worth 75% of total land value must have been inherited and concentrated in other male lines over 3 generations in pre-modern England.

Importantly, the institutional differences in adoption were not due to fundamental long-run differences between these societies. Preceding the 4th century, adoption was practiced across Eurasia as a means of insuring against the significant pre-industrial risk of biological reproduction. However, the church began preaching against adoptions in the 4th century. The institutional change was gradual but effective and the use of adoption beyond the early middle ages became rarities in most of Western Europe. This led household extinctions to play a major role in land distributions in Western Europe. This finding is consistent with the higher inequality in Western Europe relative to East Asia. This novel institutional mechanism is therefore a plausible partial explanation of the observed divergence in land inequality between East Asia and Western Europe.

A contribution of this paper is to show a long-run regional divergence in inequality which had roots in church preaching in the 4th century. The past literature had mostly focused on the 18th century onward in the case of Asia. Milanovic (2018) found cross-country evidence of pre-industrial *income* inequality being lower in Asian societies after the 18th century which is consistent with my findings.[2] Scheidel (2017) also attempted to look at a longer

[1] The figures are for childlessness among the English peers from Gobbi and Goñi (2018) and for the royal tenants from (Russell, 1948). I assume 3-4 generations per century.

[2] Income inequality is measured using social tables, which exploits estimated differences in inequality be-

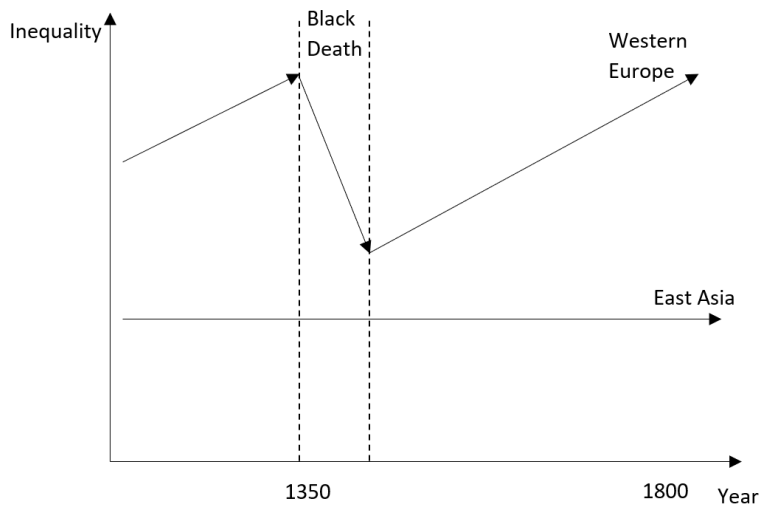


Figure 1: A Conjecture of Long-run Landownership Inequality

time scale with more fragmentary data but he concluded that all societies were converging towards high inequality in the absence of catastrophic shocks such as the world wars and the black death. However, I show evidence for an alternative path of stable equality in Japan and perhaps China (see figure 1). This newly documented dimension of divergence in landownership inequality also adds to the well known case of divergence in living standards across East Asia and Western Europe.

A second contribution is to show a novel mechanism that can explain differing wealth inequality outcomes across countries. Although my paper focuses on lands, one category of wealth, the findings are likely to translate to wealth in general. I add to a literature that has attempted to explain inequality through three approaches. At the macro level, studies have shown the importance of capital and its inheritance as a mechanism that generates inequality (Piketty, 2011, 2014; Saez and Zucman, 2016). At the micro level, studies using detailed micro-data have identified potential explanations such as differential returns on wealth (Bach et al., 2020), taxation (Jakobsen et al., 2020), tax evasion (Alstadsæter et al., 2019), genetics (Barth et al., 2020), or inheritance (Boserup et al., 2016; Elinder et al., 2018; Adermon et al., 2018). Another strand of theoretical literature has utilized simulations to show the how demographic institutions affect inequality (Kremer and Chen, 2002; De Nardi, 2004; Moav, 2005). I add to this literature by showing how differences in institutions can lead to cross-regional differences in inequality outcomes.

An implication of this paper is that religious institutions impacted economic develop-

tween typical social classes. Milanovic (2018) finds income inequality is positively correlated with population density. The regions with high population density were predominantly Asian, where rice production allowed for more people to subsist per area.

ment through its effect on inequality. This is a novel channel in a longstanding literature linking religion to economic development since the seminal book by Weber (1930). The past literature had argued religion played a major role in economic development through its effect on human behavior (Becker and Woessmann, 2009; Schulz, 2019; Henrich, 2020), social organization (Greif and Tabellini, 2017), or its effect on resource allocation (Cantoni et al., 2018). This paper suggests the church reforms also affected economic development through landownership inequality. Therefore, the church may have been a major unintentional actor placing Western Europe on its unique path of economic development.

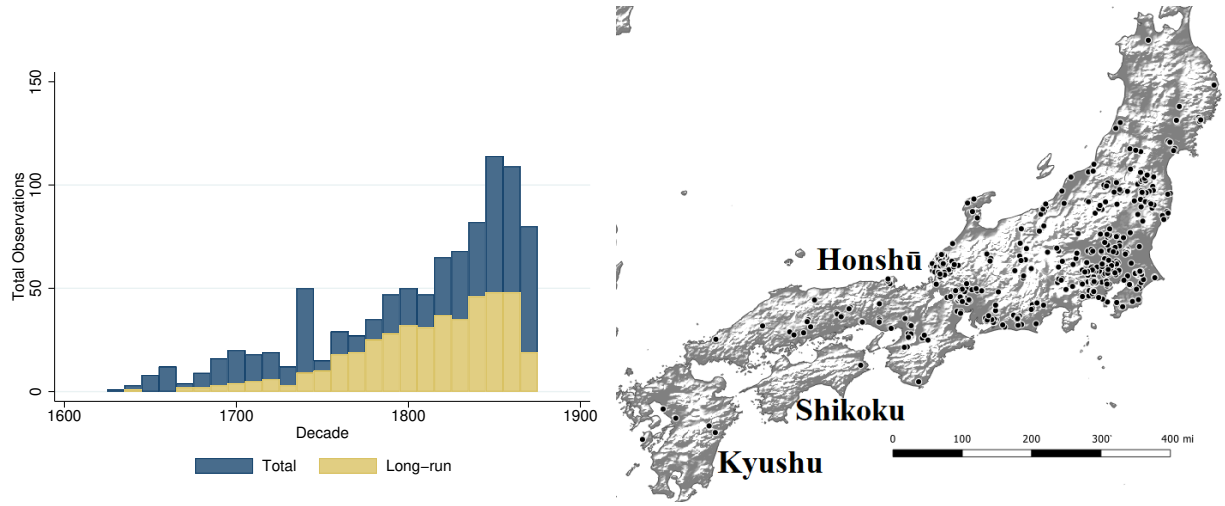
Data

My main data source are the Japanese village population censuses (*Shumon Ninbetsu Aratame Cho*) from 586 villages with sporadic observations in between 1634-1872. The population censuses were annually compiled by all villages in Japan by order of the lords. The original motive was to enforce a ban on Christians by the Tokugawa shogunate. The censuses included the names, ages, household compositions, and a declaration of religion as a means of weeding out Christians. Despite Christianity being an extreme minority in Japan by the 18th century, the surveys continued until 1870 by taking on new administrative roles. Many of these censuses began listing information on household landholdings which was the main source of wealth at these times. Importantly, I also observe landless households which are often never registered in tax registers as they were not taxable.

From the perspective of economists, landholdings can be interpreted as landownership because peasants had well-established rights to sell, rent, use, and inherit their lands. The lords owned land by law but in effect only taxed lands. Further, the samurai class lived in urban areas and did not individually own lands due to the institution of *hēnōbunri*. Instead, they earned a salary from the lords. This contrasts with the landed aristocracy of contemporary Europe. The samurai class are therefore not included in this analysis of landownership inequality as they were earning wages. An analysis including the samurai requires studying income inequality and a past study has shown the samurai were surprisingly poor and earned only 20% more income than the average peasant (Saito, 2015). The remainder of this paper will use the term landownership to refer to what has traditionally been labelled landholdings.

I collected population censuses from three sources. The first are data published in local histories which I digitized.[3] The second is the"Population and Family History Project"

[3]This data includes other village level administrative sources such as the "goningumi mochidaka chō" that list all households by the five household group who were jointly held responsible for certain problems caused by other group members. This source occasionally includes information on landownership by households.



(a) Observations by Decade **(b) Observations Across Space**

Figure 2: Observations Across Space and Time

Source: Japanese inequality data

database at Reitaku university. The third is the onlined database of Hiroshi Kawaguchi entitled DANJURO. To focus on land inequality in an agricultural setting, I drop all observations from cities, post stations, and coastal villages where non-agricultural activities were common. This leaves 2,476 village-year observations from 586 villages which I refer to as the Japanese inequality data.[4] There are unsurprisingly less observations for earlier years, due to survival bias with a dip in the 1870s when the censuses ended (see figure 2a). I also observe 84 villages over the long-run, defined as multiple observations spanning more than two decades. I use this long-run data to investigate time trends. Unfortunately, the data is highly sporadic so that villages can reappear in my sample after being missing for decades. For econometric purposes, this precludes the use of many time series techniques that require complete time series.

The geographic breadth of the data is rich and representative of the main island of Honshu, with approximately 80% of the population (see figure 2b). The topographic map (with white shade indicating higher elevations) shows how mountains dominate much of the landscape, amounting to approximately two thirds of land area. Unsurprisingly, there are few observations from mountainous terrain which only had small pockets of habitable areas. On the other hand, there are many observations in the plains where population was concentrated. The sampling for the islands of Kyushu and Shikoku in the southwest are poor and results from these areas must be interpreted with caution.

[4] I have dropped multiple observations in a decade by keeping the year closest to the middle of the decade. A detailed list of source material are available in appendix I.

The village censuses contained information on landownership that were expressed in outdated value of the yield, most often from cadastral surveys in the late 16th to early 17th century, in units of *koku* (volume of rice grain equivalent) or mon (bronze coins) and in some rare cases in area. These "official yields" were simply copied from past cadastral surveys and were never updated to account for increased plot size or increased productivity. They also did not include landownership outside the village. Thus, there are sources of measurement error but how far can they affect a measure of inequality at the village level?

Ideally, I want landownership to be in the value of land rent net of tax. The land rent net of tax in each year is a function of official yields as in equation 1.

$$land\ rent\ net\ of\ tax_{i,t} = yield_{i,0}(\Delta prod_{i,t} \times land\ rental\ rate_{i,t} - tax\ rate_{v,t})\alpha_{i,t} \quad (1)$$

The left hand side refers to the land rent net of tax which is the economic value of owning the land. Yield is the value of the yield in period 0 (or the official yield) when yields were measured. $\Delta Prod_{i,t}$ is the change in productivity since the measurement of yield and period t. $\alpha_{i,t}$ captures other factors which cannot be controlled but affects land prices such as yield risk. This would include any investments or depreciation on the plot that affects the value. The land rental rate is the implicit or explicit share of yield being awarded to the landowner in return for his rights. Finally, tax rate is what was paid by the landowner to the lord in proportion to the official yield.[5] As I am computing inequality measures that rely on landownership relative to total land owned, such as Gini coefficients, there is no problem if relative value is a function of the official yields multiplied by a constant or

$$\begin{aligned}\frac{land\ rent\ net\ of\ tax_{i,t}}{total\ land\ rent\ net\ of\ tax} &= \frac{yield_{i,0}(\Delta prod_{i,t} \times land\ rental\ rate_{i,t} - tax\ rate_{v,t})}{\sum_{i=1}^{N} yield_{i,0}(\Delta prod_{i,t} \times land\ rental\ rate_{i,t} - tax\ rate_{v,t})} \\ &= \gamma_{v,t} \times yield_{i,0}\end{aligned}$$

where $\gamma_{v,t}$ is constant within a village-year. This would hold if changes in productivity, land rental rates, and tax rates were uniform within the village. It is not possible to make the stronger assumption that $\gamma_{v,t}$ is constant across villages in a given year due to widely differing tax rates which precludes inequality measures beyond the village level.

The weaker assumption that $\gamma_{v,t}$ is constant within the village raises two concerns. First, did the land rent per official yield ($\Delta prod_{i,t} \times land\ rental\ rate_{i,t}$) vary across plots? Second, did tax rates per official yield vary across plots?

[5] The burden of tax went to the landowner due to the highly inelastic supply of land rental. The inelasticity was due to laborers having limits to the area he/she could cultivate.

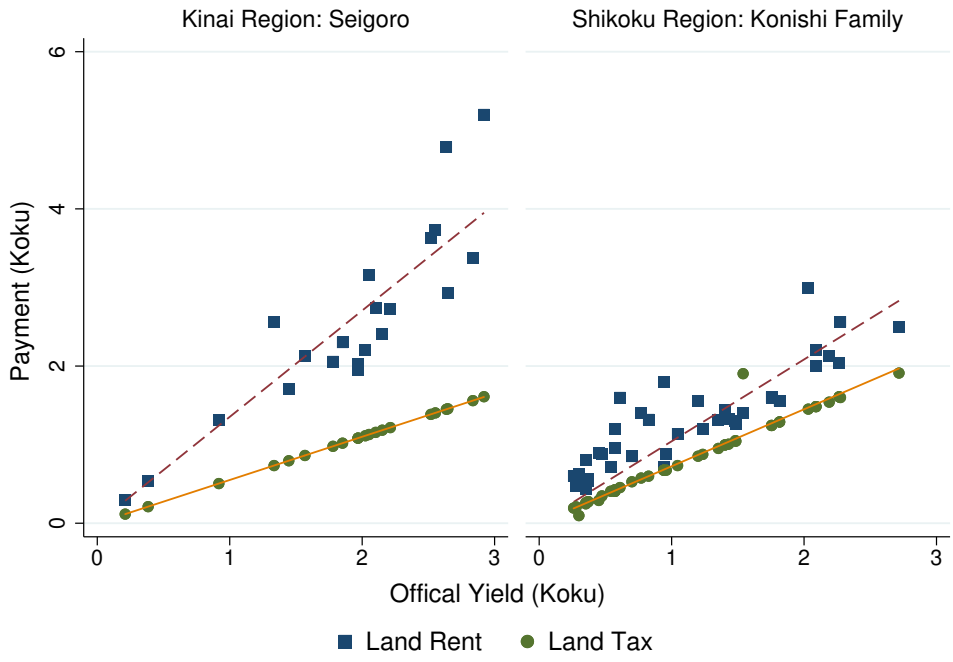


Figure 3: Land Rents and Land Tax Relative to Official Yields

Source: Takeyasu (1966) and Shoji (1986)

I can test these assumptions using land records from large landowners who recorded the land rent, land tax, and official yield of their plots. These records were made for the purposes of land rental and land sales for which this information was required. I use records that were transcribed in Takeyasu (1966) and Shoji (1986) which come from the regions of the Kinai (centered around Osaka) and the island of Shikoku in the 19th century. Although the data is from a limited number of villages, the basic institutions were largely similar across Japan, so these can be considered as representative case studies. There are 64 records that have all variables while another 63 have all data except the land tax. There are two caveats. First the village in which the plot is located is unclear. Although most plots would have been held within the village of residence, a few plots may have been outside the village resulting in variation in the tax rate. Second, there is some variation in the year of the record resulting in some time variation. Both factors will upwardly bias the detected measurement error.

Figure 3 shows both the land rent and land tax for plots of land owned by two landowners. It is immediately clear that the land tax was almost perfectly correlated with the official yield.[6] The few outliers are almost certainly due to the plot being located in another village.

[6]These findings are not entirely trivial because it was not individual plots but the aggregate village holdings that were taxed by the lord at this time in a system known as *muraukesei*. It was then the village's responsibility to distribute the tax burden across the plots. These findings confirm the individual tax burden

This confirms that the land tax was a fixed rate based on the official yield. Therefore, it is safe to assume the tax rate was constant within any village-year.

The land rental rates (gross of tax) relative to the official yield shows more variation. When I include data from the other villages, the coefficient of variation of land rents relative to the official yield is 0.3 (see appendix B.1). Therefore, the official yield is a decent proxy of true land incomes (especially when we consider this issue is shared by modern wealth data). Perhaps more importantly, land rental rates do not vary strongly with plot size in these two villages nor the other villages (see appendix B.1). Further, many households owned multiple plots of land and this will tend to further reduce measurement error following the law of large numbers. I am agnostic about the source of variation as I cannot differentiate it with this data and it is unimportant for estimating inequality.

A related concern is that productivity differences could exist across landowners. If large landowners had faster technological growth, this cannot be detected by the above exercise that focuses on single landowners. However, when true land values have been compared to the outdated official yield across landowners, such correlations are not observed (Takeyasu, 1966). There was little reason for productivity growth to be widely different within villages when available technologies were similar. Official plot yields were a very strong indicator of land values.

A final issue is that listed landownership only accounted for land within the village. This will tend to bias my inequality estimates downwards because it was large landowners who were most likely to have holdings in other villages. However, landownership outside the village would have been small due to a system of law that gave less protection to land rights outside of the village of residence (Nakabayashi, 2013). I can also estimate the extent of land owned in other villages by looking at the proportion of land owned by non-residents in 47 villages where such data is available. The average is 15%, a small proportion of land. I show that this causes a modest downward bias in my inequality estimates which does not affect my conclusions.

In the following sections I will compute the Gini coefficient, share landless, and the share of land held by the bottom 20%, bottom 40%, top 20%, and top 10% which are the standard inequality measures within the literature. They are all computed using standard formulae at the household level, the unit at which land was owned, inclusive of the landless. I focus on Gini coefficients when looking at time trends but this is to avoid repetition due to the high correlation of these measures (see appendix B.2). The observations will be weighted by total households-village-decade. The village-decade weight gives equal weight to each village-decade so that I better capture long-run fluctuations. The total household weight

was set based on the official yield of each plot.

Table 1: Long Run Trends by Region

			Japan				Italy	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All	West	Central	East	Northeast	Tuscany	Piedmont	Venice
Time	-0.038	0.012	0.044*	-0.005	-0.086*	0.069***	0.062***	0.076**
(Century)	(0.032)	(0.039)	(0.024)	(0.035)	(0.049)	(0.006)	(0.014)	(0.027)
Preblack						0.110***		
						(0.034)		
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1861	458	282	387	734	99	27	26
Adj-R^2	0.913	0.981	0.941	0.804	0.849	0.646	0.840	0.589

Standard errors are in parenthesis and clustered by village.
$*p < 0.1, **p < 0.05, ***p < 0.01$
Source: Japanese inequality data

gives higher weight to larger villages although I show the results do not change when I weight each village equally.

Inequality Estimates

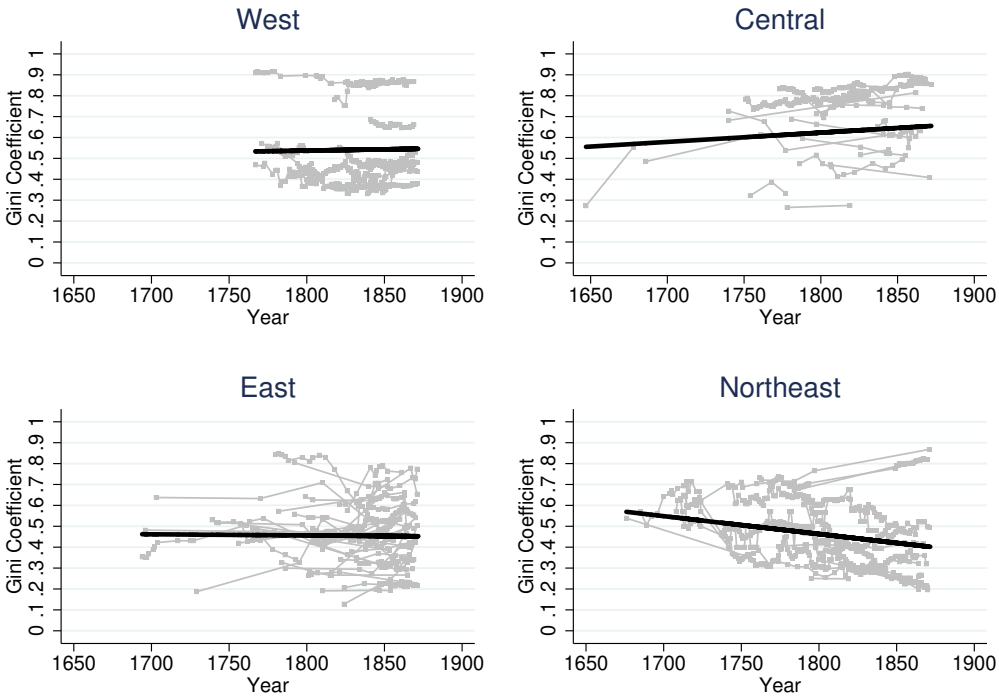
Time Trends

I first estimate time-trends in inequality using long-run data from 76 Japanese villages, 1647-1872. I estimate a linear time trend using village fixed effects.[7] As there is potential regional heterogeneity, I estimate both in aggregate and by region as defined in appendix A1.

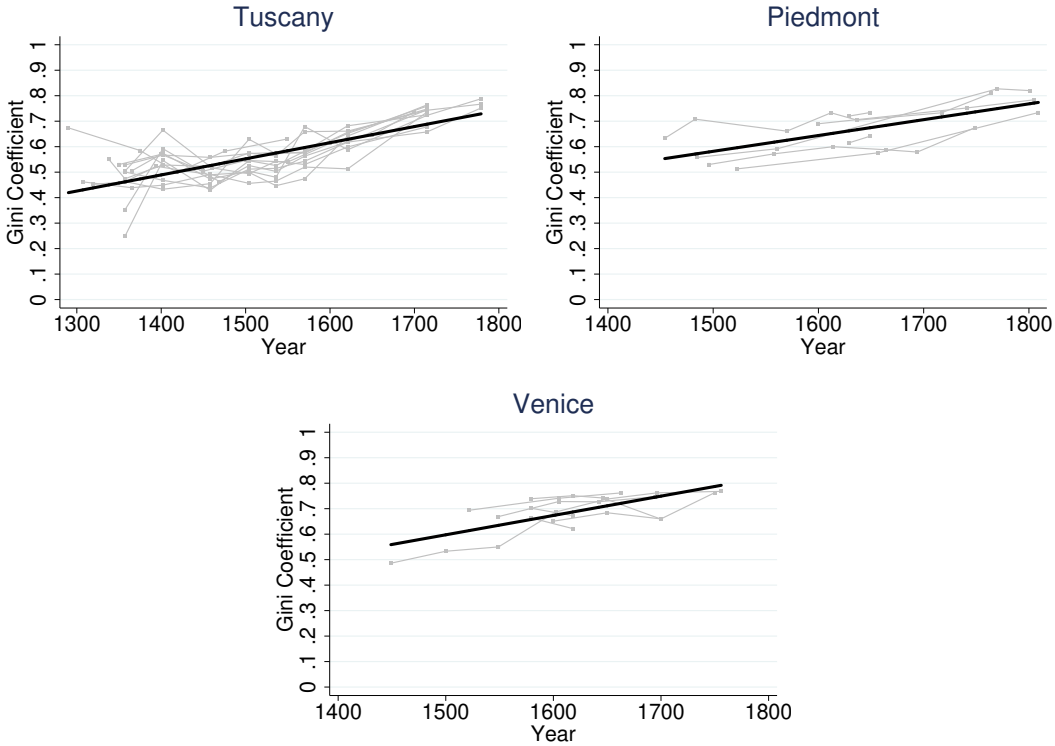
Figure 4a plots the data with the regression prediction by region. It shows there is much heterogeneity in inequality trends by village possibly due to local phenomena. However, there is no clear trend in aggregate. The regions of the west and east have almost zero trend, while central has increasing inequality and the northeast has decreasing inequality. This is confirmed in the regression as shown in table 1. I find the coefficient is negative but insignificant in aggregate. When splitting the sample by region, the central and northeast regions have marginal significance but with opposite trends.

There are a number of concerns with this analysis. First, there may be non-linear trends in the data that are hidden when only looking for linear trends. In particular, the major famines of the 1780s and 1830s may have functioned like a "catastrophic shock" that reduced

[7] Specifically, I estimate $ineq_{v,t} = \alpha_v + \beta year_t + \epsilon_{v,t}$



(a) Japan



(b) Italy

Figure 4: Pre-industrial Rural Wealth Inequality Dynamics

inequality and counteracted an overall increase. Although figure 4a shows no sign of this, I formally test this in appendix C.1. I show the famine years in the 1780s coincided with decreased inequality while the famine in the 1830s had no effect. However, this did not mask a general positive trend in other decades.

Second, villagers could be increasing landownership outside the village that are not included in the village census. I test this in appendix C.2 where I proxy external holdings using the total land owned in each village. The total land owned is the sum of all within-village landownership by residents. The remainder of the lands were either abandoned due to depopulation/environmental reasons or were owned by non-residents. Therefore, decreasing total landownership could reflect increasing external holdings in the region. However, I find no evidence for increasing external holdings over time.

For the purposes of comparison, I can conduct similar analysis as above in the case of 18 rural Italian villages, 1307-1809, which were collected from tax records and made available in (Alfani, 2015; Alfani and Ammannati, 2017). I refer to the original articles for a detailed description of the data. For the purposes of measuring village-level wealth inequality, many aspects of the data are comparable. The Italian data is based on real estate at the household level. The inequality measures are also at the village level. However, there are some comparability issues. First, the Italian data is inclusive of housing. The distribution of housing is unknown for Italy but a detailed study from 18th century Spain by Nicolini and Ramos Palencia (2016) showed non-land properties were more equally distributed than agricultural lands. Further, non-land assets were only 12% of the value of real estate. If these societies were similar, the Italian measures underestimate land inequality and most of the inequality will be generated by lands. Second, the propertyless are not included which will decrease inequality measures although the available evidence suggests the bias are small (Alfani, 2015; Alfani and Ammannati, 2017; Alfani and Di Tullio, 2019). This will also downwardly attenuate trends if the share landless and gini coefficients are correlated.

The differences in wealth inequality trends between the two regions in figure 4 are striking. All villages are generally trending upwards after the black death. The rate of increase was also very high with a 0.07 increase in gini points per century (table 1). Italian villages clearly had very different dynamics to Japan.

Inequality Levels

I next estimate inequality levels for Japan as a whole while assuming stable inequality during the period. The main issue is the lack of observations, mainly in regions outside the main island of Honshu, combined with potential regional heterogeneity. In order to

Table 2: Inequality Estimates for Villages in Tokugawa Japan

Region	Gini	Share Landless	Wealth Owned by Bottom 40%	Top 20%	Top 10%
Kyushu	0.58	0.18	0.06	0.63	0.44
Shikoku	0.60	0.17	0.06	0.64	0.45
Chugoku	0.53	0.13	0.08	0.57	0.39
Kinai	0.65	0.22	0.03	0.68	0.49
Tokai	0.52	0.10	0.08	0.55	0.37
Tosanchubu	0.60	0.16	0.06	0.64	0.46
Hokuriku	0.65	0.20	0.03	0.69	0.50
Kanto	0.50	0.07	0.10	0.55	0.38
Tohoku	0.57	0.19	0.07	0.60	0.42
Japan	0.57	0.16	0.07	0.61	0.43

All prefectures are weighted by rural population in the 1870s in order to calculate overall inequality.
Source: Japanese inequality data

account for unobserved areas, I predict inequality by assuming persistence in land ownership inequality between the Tokugawa period, 1647-1872, and the modern era, 1883-1895. This assumption is reasonable due to the slow moving nature of wealth inequality combined with their being less than two decades between the two points of observation.

For modern Japan, I use prefectural level data on the share of farmlands under tenancy as a proxy for landownership inequality. This data was originally recorded in prefectural statistic books and later compiled by Arimoto et al. (1984). The share of land under tenancy records the area of plots farmed by tenants divided by the total area. This is a measure of inequality because lands that could not be cultivated by household members were generally rented out.

This estimation procedure is known as "backward projection" in the literature and is conducted in two steps. First, I estimate an OLS regression of inequality measures in the two periods. Second, I predict inequality in regions with few observations. I summarize the important parts of this process here and provide further details in appendix D.

In the first step, I coded all village locations into modern prefectures and estimated the corrletion in inequality between the two periods.[8] I unsurprisingly found a very strong correlation between various inequality measures and the share of land under tenancy in the late 19th century. In the second step, I estimated landownership inequality in Japan as a whole by "predicting" inequality in prefectures with less than 3 villages worth of observations.

The resulting estimates are presented in table 2. The gini coefficient is only 0.57 which is

[8]Specifically, I estimate $Modern\ inequality_i = \alpha + \beta Tokugawa\ inequality_i + \epsilon_i$

surprisingly low considering lands tends to be highly unequally distributed. The share of land owned by each class of peasant sheds light on the structure of landownership. The bottom 16% were landless and the next 24% owned 7% of the land and were small landowners who would need to rent large amounts of land to utilize their labor. The middle class peasants, from the 5th to the 8th decile of landownership, owned 32% of the land and would have been less reliant on tenancy. Finally, the top 20% were the upper class who owned 60% of the land making them the landowning class who could rent out their lands to the lower classes within the village. Despite this being an unequal distribution of land, it is surprising that a large share of the population owned significant amounts of land. Moreover, 84% of peasants were landowners showing Japan was a society of landowning peasants.

The regional estimates show there was some regional variation. Gini coefficients varied from 0.5 to 0.65 with the most equal areas being the Kanto region surrounding Edo (current day Tokyo) and the coastal prefectures to the west of it. In contrast, the most unequal areas was the Kinai region surrounding Osaka and Kyoto and the northern coastal regions. Importantly, I show later that even the most unequal regions in Japan were more equal than the typical Western European village by 1800.

There are a number of concerns with the methodology that are addressed in detail in appendix D. First, the weighting could be changed to give equal weight to each village. However, re-estimating inequality using this method only changes the Gini coefficient to 0.58 and is not driving the results. Second, I use village inequality levels as the prefectural inequality level if I observe more than 3 villages. This could lead to inaccuracy. However, using only predicted inequality from the backward projection leads to a lower inequality estimate of 0.54. My estimates are also higher but close to the sample averages by region of inequality within villages which had a gini coefficient of 0.53. All of these alternative estimates suggest my preferred estimates are robust to changes in the methodology.

Another concern is the lack of observations of landownership outside the village, which leads to a downward bias. I can estimate an extreme upper bound for inequality by assuming the richest person owned all of the land outside the village. Assuming such land amounted to 18% of within-village landownership values, as implied by the available data, the implied upper bound Gini coefficient will be 0.64. The reality have likely been less extreme and closer to 0.6 which remains highly equal.

International Comparisons

Table 3 compares a cross-section of inequality across societies as they approached industrialization. Some caution is required in interpreting these differences as they come from

Table 3: Wealth Inequality in Pre-industrial Societies

Country	Year	Type	Unit	Gini	Landless %
East Asia					
Philippines	1903	Land	Rural Households		19
China	1930s	Land	Rural Households	0.35–0.43	17–33
Japan*	1647-1872	Land	Rural Households	0.57	16
Western Europe					
England	1720-1850	Land	Rural Adult Males	0.7-0.9	40-60
France+	1825	Land	Rural Households	0.71	
Germany+*	1800	Real Estate	Rural Households	0.53	
Sweden	1750	Wealth	Rural Households	0.72	20
Denmark	1789	Wealth	Rural Households	0.87	59
Finland	1800	Wealth	Rural Adult Males	0.87	71
Northern Spain	1749-59	Land	All Households	0.87	
NW. Italy+*	1700-99	Real Estate	Rural Households	0.77	
NE. Italy+*	1750	Real Estate	Rural Households	0.79	
Central Italy+*	1700-99	Real Estate	Rural Households	0.75	

+ indicates propertyless are excluded. * indicates village-level estimates. The Philippines estimate is the share of farms cultivated by tenants which likely results in an overestimate. Chinese estimates from the 1930s use figures for North China and South China to get a range of Gini coefficient. The proportion landless is from two different estimates for all of China in Buck (1937). English estimates are based on land areas rather than values. French estimates are based on tabulated data from Heywood (1981) as described in appendix E. Northern Spain's estimates are from Palencia, Northwest Italy estimates are from Piedmont, Northeast Italy estimates are from the Republic of Venice, and Central Italy estimates are from Tuscany.
Sources: Sanger (1905), Buck (1937), Soltow (1979), Heywood (1981), Soltow (1981), Brandt and Sands (1990), Kung et al. (2012) , Alfani (2015), Nicolini and Ramos Palencia (2016), Alfani and Ammannati (2017), Bengtsson et al. (2018), Alfani and Di Tullio (2019), Kumon (2021)

limited source material from a wide range of studies.

The most comparable data come from Germany, Italy, Japan and England which are measured at the village-level and wealth is mostly in the form of land.[9] However, the measures for Germany and Italy do not include propertyless people (indicated by a "+" on the table) leading to a downward bias. However, in the cases where the share of propertyless can be estimated in Italy and Germany, the downward biases were mostly small and changed the Gini by a few percentage points. The other measures were made at the national level. As the village-level inequality does not account for between-village inequality, it underestimates national level inequality. One measure that is robust to this issue is the proportion of landless households.

[9]Germany and Italy uses property tax records, which was essentially a tax on real estate.

Other more minor issues include the type of wealth and unit of measurement. Some Western European studies measured real estate in general while others only measure land. However, as stated earlier, Nicolini and Ramos Palencia (2016) showed that lands were 88% of the value of real estate in 18th century Spain. Further, lands were more unequally distributed than non-land properties. If these societies were similar to Spain, the bias due to this difference is downward. Finally, the unit of measurement also differed with a few measuring adult males instead of households. The direction of this bias is unclear although most adult men would have had their own household and biases are likely to be minor.

Despite these limitation, the evidence strongly suggests East Asian societies were more equal than those in Western Europe.[10] Gini coefficients in Western Europe are generally close to 0.8 while that in East Asia are below 0.6. As shown earlier, an upper bound estimate of Japanese village-level inequality would suggest a Gini coefficient of 0.64 which is still far lower than the Gini coefficient of Western Europe which are mostly under-estimated.

Another interesting feature is the differences in the shape of the distribution with larger shares of landless in Europe (with perhaps the exception of Sweden). These measures match the wider historiography such as the idea popularized by Marx (1867) of the emergence of the proletariat in 18th century Europe, although more recent studies have shown they emerged much earlier than Marx hypothesized (Shaw-Taylor, 2001). This also applies to other countries such as 16th century Holland. Van Bavel (2005) shows that up to 60% of the rural population in Holland were reliant on wage labor. In contrast, the East Asian literature has often focused on the landowning peasant (Smith et al., 1959; Huang, 1990).

Could this result be due to differences in measurement? The potential biases, due to the exclusion of the propertyless and the inclusion of real estate in general, work against my conclusions. However, could this finding be due to my measurement of Japanese inequality at the village-level? When I focus on the village-level studies, Japanese inequality remains lower than England and Italy. Only Germany has comparable inequality but this is explained by the catastrophic shocks that decreased inequality, as I will explain below. Another reassuring finding is that measures of income inequality, which should be highly correlated with wealth inequality, also sketch out similar patterns (Milanovic et al., 2010). Finally, the magnitude of differences also suggest minor measurement errors cannot overturn the results.

Are these results driven by the timing of observations? Western Europe was about to start an industrial revolution, and a symptom may have been growing inequality. I show the longer-run trends where available in figure 5. It shows the trends in inequality in Italy were upward long before industrialization. The same is true for Germany, although

[10] Eastern Europe may have been more unequal as demesnes, farms that were owned and managed by lords, dominated the lands and this limiting peasant holdings (Cerman, 2012).

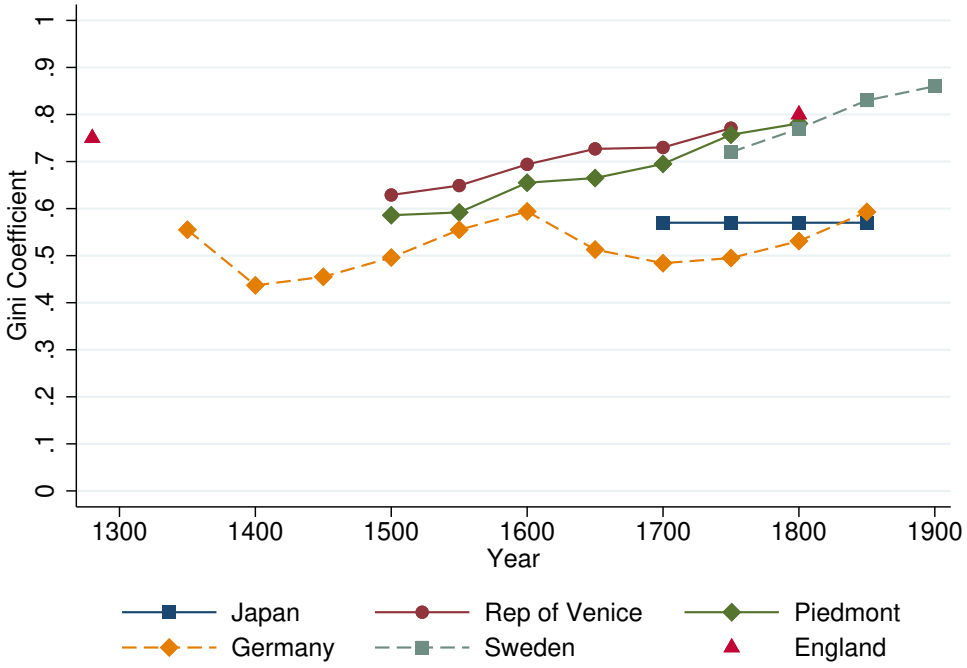


Figure 5: International Trends in Rural Wealth Inequality

Sources: Japanese inequality data, Alfani (2015), Bengtsson et al. (2018), Alfani and Di Tullio (2019) Alfani et al. (2020), Kumon (2021)

the catastrophic shocks of the thirty years war, 1618-1648, in addition to the black death temporarily reduced wealth inequality (Alfani et al., 2020). Further, similar findings emerge based on urban inequality estimates as documented extensively by Scheidel (2017). This contrasts with the stable trend I found for Japan.

It is also unlikely that Western Europe was similar to East Asia in the more distant past. Although the data is more limited, we know that inequality was significantly higher in German and Italian villages preceding the black death. For the case of medieval England, Campbell (2008) suggests 47% of the rural population were landless laborers in 1290 and other data from the hundred rolls in 1280 suggests land ownership inequality among peasants had a gini coefficient of roughly 0.75.[11] Western Europe seems to already have had high inequality in the medieval period.

In contrast, the available evidence from Japan and China suggest a history of equality. China introduced the equal fields system in 485 that was continued up to 780. Each man of age 15-59 was theoretically allocated 100 *mu* of lands although the reality was less equality due to land scarcity (Mitani, 2015). This was also inherited by Japan via the *Handen* system

[11]Medieval English peasants did not own lands by law but had many land rights which can be considered land ownership in the economic sense.

from the 7-10th centuries (Iyanaga, 1980). Although we know little of the context of these policies, it is likely that these policies accepted realities of relatively equal landownership rather than being a radical redistribution imposed by the state.[12]

Overall, the available evidence suggests these two regions appear to have been on divergent paths of inequality over the very long-run. East Asia had stable equality while Western Europe was converging towards higher inequality. These patterns also precede the black death. Any explanation for these differing outcomes must therefore have persistence over one millennium.

Explaining Inequality

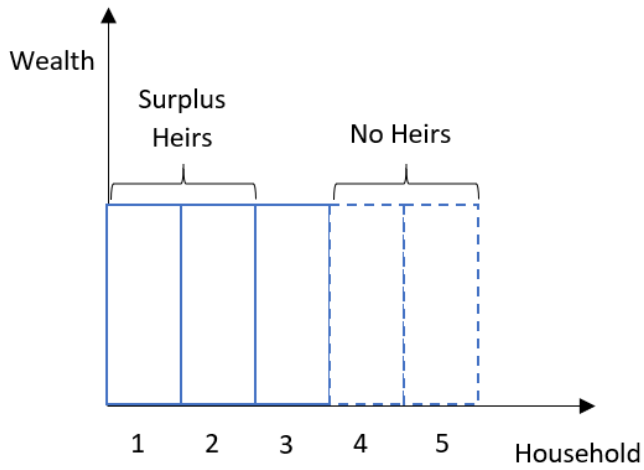
How can we explain the lower landownership inequality in East Asia relative to Western Europe over the very long-run? I suggest a new hypothesis that the widespread use of adoption as heirship strategy in East Asia but not in Western Europe can partially explain this regional difference. Adoption is where a person becomes the legal parent of an adoptee and the adoptee gains the rights associated with being a biological child. Adoption affects land distributions because it gives the adoptee rights over wealth inheritance. Unlike in the modern era, where adoption is mostly about the welfare of the adoptee, most adoptions in the pre-industrial era was about the continuation of male lines. Therefore, adoption was a strategy of heir-ship when biological heirs were lacking, allowing lands to be retained within the male line.

The implications of adoption on land distributions can be captured in a simple example. Suppose a society where land is passed down a single male line (impartible inheritance) with no social mobility.[13] In the case that the male line fails (household extinction), suppose household lands are redistributed to another household with a surviving heir. This is consistent with the European system in which lands enters other male lines by will or the marriage of heiresses.

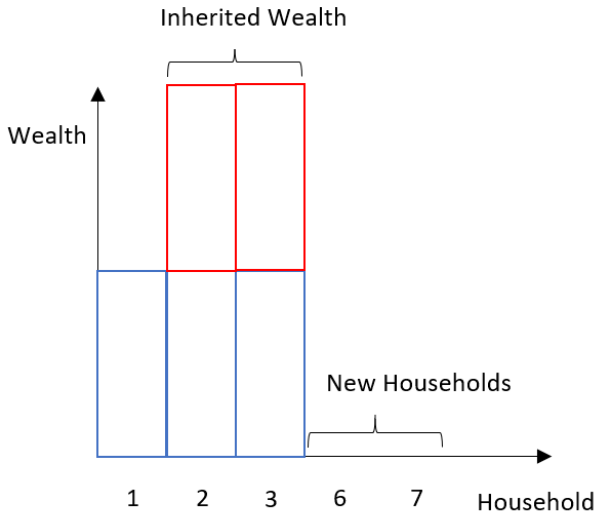
Figure 6 shows what can happen over two generations in a society which initially has an equal distribution of land. In the first generation (figure 6a), two households have surplus heirs and two households have no heirs. In a society without adoption (figure 6b), the households without heirs go extinct and its land is passed onto other households. As a result, households 2 and 3 become relatively rich. The surplus heirs form new households but get no land in a society with impartible inheritance. There is therefore a tendency for

[12]More details are available in appendix F.

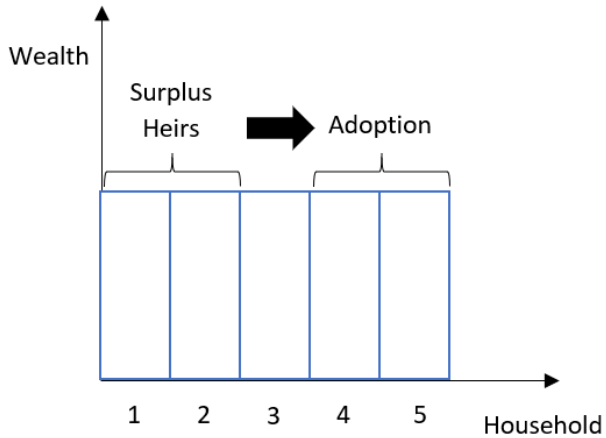
[13]Impartible inheritance was common in pre-industrial societies for land assets in particular. This was because splitting lands could lead to lands that were too small. Also, management of lands was easier when it was consolidated. The same was not true for most move-able assets.



(a) First Generation



(b) Second Generation: No Adoption



(c) Second Generation: Adoption

Figure 6: Land Distribution Across Two Generations

the emergence of a landless class. Overall, having too many or too few children makes the second generation more unequal in a society without adoption.

In contrast, a society with adoption will have the surplus heirs redistributed to the households without heirs and there is no change in land distribution. Also, the adopted heirs forfeited their land inheritance from their biological parents meaning they only inherit land from one set of parents. Adoption therefore functions as an insurance on heirship. For a non-adoption society to have a similar outcome, it requires each household to have exactly one male heir which was impossible due to randomness in child sex, high variance in fertility, and high child mortality. The overall effect of adoption was to redistribute heirs and shut down the gradual concentration of land due to household extinctions.

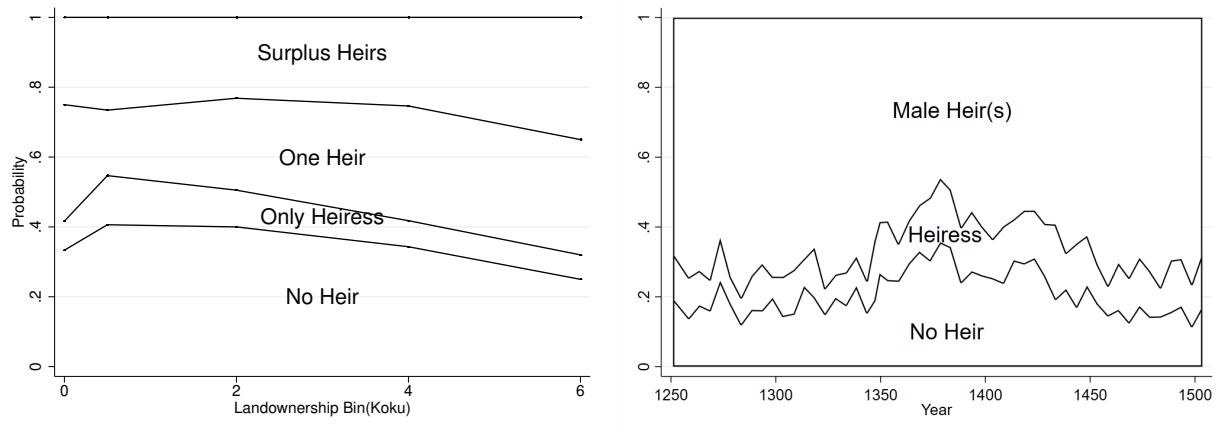
The intuition also holds if I change the assumptions. If the society has partible inheritance, greater inequality will still be generated in the case without adoption. However, it is to a lesser degree because there will be no landless households. A further extension is a case where there is initially some inequality. In such a case, adoption does not have to occur perfectly, whereby each household gets one heir, in order to reduce inequality. Among households that are landless, who have no land to inherit, the extinction of the household only decreases landownership inequality. More specifically, if there is a correlation between adoption and landownership, adoption will reduce landownership inequality.

To summarize, adoption can reduce inequality in a society if two features are present. First, there must be uncertainty in heirship. Having too many heirs or no heir will lead to inequality. Second, adoption must be correlated with landownership of the household so that the rich households are less likely to go extinct.

Empirical Evidence: Adoption and Inequality

I use evidence from three Japanese villages where the censuses have continuously survived allowing for the construction of annual panel data. The data includes information on landownership, household composition, the relationship of each member to the household head, and the names and ages of all individuals over many generations. The use of annual observations is important for identifying adoption. Household members are recorded as adopted when they enter the household but lose this distinction if they become the household head, as they often did. The annual data also allows me to observe households that go extinct due to the lack of heirs.

I would ideally observe all births and deaths by generations so that I can observe whether households had male heirs. However, there are two issues. First, births and deaths are recorded only for those resident who were present in the village during any survey. Missing



(a) Japanese Heirship by Landownership **(b) English Elite Heirship over Time**

Figure 7: Share of Households by Biological Heirship

Note: I use the number of biological heirs listed in the sources at the end or reproduction (Japan) or at the point of death (England).
Source: Japanese inequality data, Russell (1948)

births is not a major issue since I am interested in the net effect of fertility on heir-ship. The other issue is the potential for heirs to leave the village and remain unobserved. In such a case, households could disappear from the census but actually be intact in another village. However, it was rare for households to move due to the regulations for migration at the time. Nevertheless, I account for this in a robustness test. A second issue is that I do not observe all outcomes for those who out-migrate. Within the recorded sample, 57% left the village as adoptees which is consistent with my narrative. However, the remaining 43% may have also eventually been adopted after leaving the village for other reasons. It is therefore difficult to study adoption from the perspective of children born in the village. Instead, I look at adoption by households within the village which was accurately recorded by the censuses.

Due to the need for detailed data, this is also a limited sample. Two villages, Ishifushi village, with observation from 1752-1812, and Tonosu village, with observation from 1790-1859, are from the current region of Fukuoka in northeast Japan while Hanakuma village, with observation from 1789-1869, is from the current region of Hyōgo. However, less detailed indicators from other regions suggest it is representative of land inheritance and adoption in Japan as a whole with the possible exception of Western Japan where adoption remains understudied (see appendix G).

I first show how Japanese households performed at biologically producing male heirs. I take each household-generation and plot the number of surviving heirs at the end of their

reproductive cycle against landownership in bins in figure 7a.[14] The data shows that the land poor class, with less than 1 koku of holdings, had a 34% chance of having no male heir while the land rich had a slightly lower chance of 24%. Therefore, landownership could increase fertility and lessen the probability of having no heir but this also had its limits.

Producing heirs was not a unique problem for the rural elite of Japan. This was equally true for other societies, including the elite of England as shown in figure 7b.[15] I find that 28% of English elite households had no male heir during normal years, and an even larger 42% failed to have a male heir during the century after the black death when mortality rates rose. This relationship was highly stable over many centuries and we know the later elites did no better at securing heirs (Gobbi and Goñi, 2018). Therefore the securing of male heirs was a common issue for these societies due to 1) half of children being female and 2) the high mortality rate during this era meant approximately one third of children died before adulthood (Wrigley et al., 1997).

Adoption was an institution that could resolve the issue of heirship. The Japanese peasants often adopted adult men to marry into their household. The adoptee would usually be the surplus sons of other peasants, who were not in line to inherit lands. They did not have to be nephews, as in other societies, and could be strangers. Adopting adults had the advantage of reducing risk associated with mortality at younger ages. The preferred form of adoption was for adopted sons to marry daughters but the next generation could be composed of total strangers if the parents had no surviving children (Kurosu and Ochiai, 1995).

Unlike the modern Western style adoption where child welfare is a key motive, the Japanese adopted in order to preserve the male line. I can causally show this by testing whether parents had adopted a male heir by the end of their reproduction conditional on their success at biologically producing male heirs as shown in equation 2.

$$Adopted\ Male\ Heir_i = \alpha_v + \beta_1 Biological\ Male\ Heir_i + \beta_2 landownership_i + \epsilon_i \quad (2)$$

The dependent variable is a dummy for whether the parents adopted a son by the end of their reproductive cycle. This will capture a subset of adoptions that eventually occurred. The key independent variable is either a dummy of whether a male heir exists or the number

[14]The end of reproduction was usually when the wife was age 45 but could be earlier due to mortality of one member of the couple. The average landownership was 4 *koku* (a local unit measuring value in volume of rice). The bins are 0, 0 to 1, 1-3, 3-5, 5+ in koku units. Those below 1 koku can be considered land poor and those within the 6 koku bin can be considered land rich.

[15]I use data from the inquisition post mortem as collected by Russell (1948) to plot the number of male heirs who inherited the land upon the death of an elite class, the tenant in chief, who held feudal land tenure from the king. Only single male heirs were recorded, and if none existed, all female heiresses were recorded.

Table 4: Adoption and Male Heirship

		(1)			(2)	
	OLS	1st Stage	2nd Stage	OLS	1st Stage	2nd Stage
=1 if No Bio. Heir	0.231***		0.443**			
	(0.044)		(0.196)			
Number of Heirs				-0.107***		-0.201**
				(0.019)		(0.095)
Landownership (Koku)	0.002	-0.000	-0.001	0.002	0.006	0.000
	(0.003)	(0.009)	(0.005)	(0.003)	(0.019)	(0.006)
=1 if First Child Male		-0.201***			0.444***	
		(0.062)			(0.131)	
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	350	177	177	350	177	177
Adj-R^2	0.103	0.060	0.149	0.077	0.047	0.032
First Stage F-stat			10.674			11.478

Huber-White robust standard errors in parentheses.
$*p < 0.1, **p < 0.05, ***p < 0.01$
The dependent variable is whether there is an adopted heir within the household at the end of reproduction. Heir refers specifically to male heirs. Koku is a local unit measuring value in volume of rice.
Source: DANJURO database

of male heirs. I instrument this with the sex of the child for the first observed birth which is exogenous.[16] As controls, I use village dummies and the quantity of landownership.

Table 4 shows the instrument of the sex of the first child is highly correlated with male heir-ship. Using the instrument, I show that the lack of heir increased the chance of adoption by 0.44 which is much higher than the OLS based estimate. I get a similar result if I change the independent variable to the number of heirs. I can also account for the ages of the children and their chances of survival to adulthood or whether any sons had left the village but the results remain the same (see appendix H). The magnitude of these results show the lack of male heirship was the key driver of adoption in Japan at this time.

How did this affect household extinctions? To answer this, I reorganize the data and take one observation at the point of household succession (when the household head changes) or extinction. I estimate how landownership affected household disappearances and extinctions.

$$Extinction_i = \alpha_v + \beta_1 landownership_i + \epsilon_i \tag{3}$$

[16] Although infanticide was common at the time, it would have been extremely rare for this to occur on the first birth. Moreover, there was not sex-bias in infanticide but instead there was sex-balancing (Drixler, 2013). In line with this, 82 of 177 observed first births were male which is slightly less that 50%.

Table 5: Landownership and Extinction

	(1) Household Disappearances			(2) Household Extinctions		
	OLS	1st Stage	2nd Stage	OLS	1st Stage	2nd Stage
Landownership	-0.022***		-0.022***	-0.007***		-0.009***
	(0.004)		(0.005)	(0.003)		(0.003)
20 YR Lagged Landownership		0.871***			0.871***	
		(0.049)			(0.049)	
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	336	336	336	336	336	336
Adj-R^2	0.113	0.655	0.113	0.018	0.655	0.016
First Stage F-stat			321.655			321.655

Huber-White robust standard errors in parentheses.
$*p < 0.1, **p < 0.05, ***p < 0.01$
The dependent variable is whether there is an adopted heir within the household at the end of reproduction. Heir refers specifically to male heirs. Koku is a local unit measuring value in volume of rice.
Source: DANJURO database

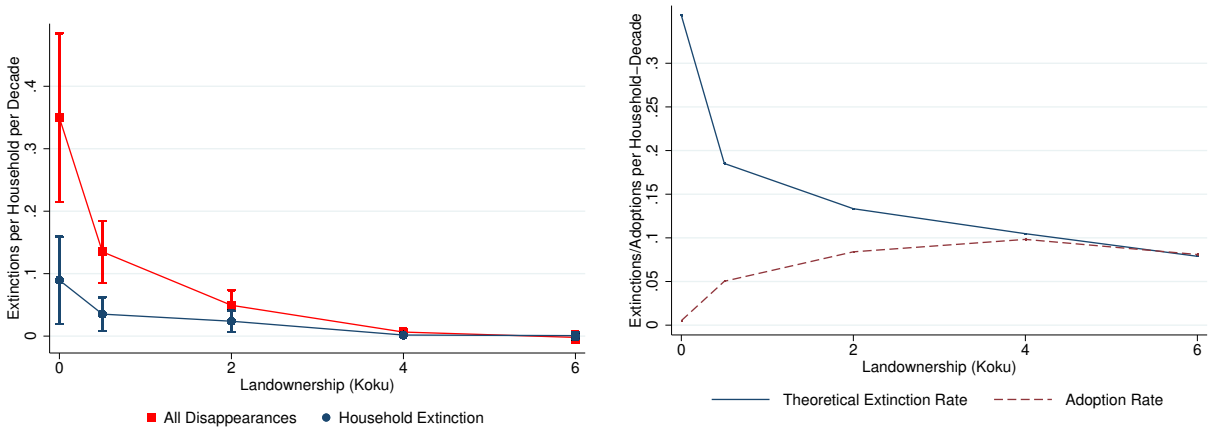
The dependent variable is household extinctions. As household extinctions are not explicitly mentioned in the census, it can be liberally defined as cases in which households disappear from the village census. However, this definition may also capture migration (although household migration was rare) so I also make a conservative definition based on households that both disappear and have no potential heirs. The main explanatory variable is landownership and I use village dummies to control for village heterogeneity.

One concern is that households deciding to go extinct may have slowly sold off their lands leading to reverse causality. I therefore instrument landownership with a 20 year lagged landownership which should precede the decision to sell off lands and address reverse causality.

I find that regardless of the definition of household extinction, landownership had a strong negative effect. The magnitude appears small but this is because only 14% of households disappeared and only 4% went extinct per generation. Therefore, the estimates suggest owning lands quickly reduced the probability of extinction to zero. As explained earlier, the negative correlation between household extinction and landownership should theoretically have decreased landownership inequality.

Another way of addressing the effect of adoption is to look at the rate of adoption/extinction. To do this, I take each household-year as an observation and estimate the effect of landownership on extinction which I show in figure 8a.[17] Consistent with the earlier analysis, those

[17] I use village fixed effects and landownership bins of 0, 0-1, 1-3, 3-5, and 5+. The average landownership was 3.5-4 *koku* of land.



(a) Extinction Rates

(b) Adoption and Theoretical Extinction Rates

Figure 8: Rates of Extinction and Adoption per Decade by landownership

households that had landownership close to or above the average of 3.5-4 *koku* were not going extinct. This was clearly driven by adoption, defined as the number cases where an adoptee succeeded the household as plotted in figure 8b. Adoption rates were much higher among the rich and functioned close to its theoretical ideal of preventing all household extinctions. This is not surprising as both the adopter and adoptee had much to gain from the relationship. Adoption also functioned, but to a lesser degree, among poorer households. Most notably, it was land poor households with lands worth less than 1 *koku* or those that were landless that had the highest rate of extinction. However, the extinction of the landless must have been increasing equality as the poor households tended to disappear, decreasing the share of the poor within villages.

Finally, how effectively did adoption insulate lands from being redistributed via social mechanisms? One measure of this is the share of lands owned by households that went extinct. I find extinctions led to only 10% of lands being redistributed per century. Such lands were taken by relatives or passed to village organizations who at times found families to take over the land (Okada, 2006). This contrasts with the English data in figure 7b where 20-30% of the richest male lines were going extinct per generation suggesting 60-90% of lands would have been transmitted to other male lines within three generations or approximately one century. Although there is no comparable data to track landownership in England, there is no shortage of documented cases of households becoming rich due to marriages to heiresses (Clay, 1968; Habakkuk, 1994; Payling, 2001; Broad, 2004).[18] This land redistribution via

[18]For example, Broad (2004) documents the rise of the Verney family from the 17th century as a consequence of three generations of eldest sons marrying substantial heiresses with no evidence of initial sentimental attachment.

social mechanism led to greater concentrations of land among the lucky few.

Discussion

How plausible is adoption as a mechanism for explaining inequality beyond Japan? Specifically, can it explain why East Asia became peasant societies with equal and widespread landownership relative to Western Europe? The uncertainties in biological heirship certainly existed throughout the pre-industrial world, due to high mortality, resulting in the problem of heirless households. Fertility could partially but not fully resolve the problem. Moreover, the Malthusian logic assured living standards were low over the long-run (Clark, 2008). Consequently, fertility was close to net zero meaning each household had just over two children make it to adulthood. Given randomness in sex, the vast masses would often not have a biological male heir.

Perhaps the more substantial issue is where adoption was practiced and why the differences emerged. Surprisingly, adoption was widely practiced across Eurasia during ancient times. In East Asia, the practice began by the Han period in China, 206 BCE-220 CE, the Nara period in Japan, 710-794, and the early Chosun dynasty in Korea, 1392-1910, as seen by genealogies or law codes (Hayashi, 1988; Brown and de Crespigny, 2009; Peterson, 1996). The institution of adoption continued to be widely practiced into the 18th century. In particular, adoption is well-studied for the elite class and adoption rates were as high as 8% in China, 1750-1849, 21% in Korea, 1750-1849, and 37% in Japan, 1700-1799. (Moore, 1970; Feng and Lee, 1998; Kim and Park, 2010).[19] Importantly, adoption was motivated by the desire to secure an heir (Feng and Lee, 1998; Kim and Park, 2010) and it reduced household extinctions.[20]

Beyond East Asia, it was also common in the ancient Near East and Mediterranean, such as in Babylonia, Middle Assyria, Greek and Roman Egypt, Greece and Rome (Hübner, 2013).[21] In fact, the term "adoption" originated in ancient Rome (Goody, 1969; Corbier, 1991).[22] The most convincing evidence for its widespread use in ancient Europe comes from a Roman census list of 1450 individuals. For those over age 50, almost all households had a male heir which could only have been possible with adoption in an ancient mortality regime

[19]The Chinese case is from the Qing nobility, the Korean case is from the *Bulcheonwye* families, and the Japanese case is from the samurai of a small sample of lords.

[20]The motive of securing heirship can be seen in East Asian societies where adoption increased when birth rates fell.

[21]The evidence is mainly from law codes, such as the code of Hammurabi (1792BCE-1750BCE) or the middle Assyrian law code (1450-1250BCE), or from adoption contracts such as those from Roman Egypt.

[22]The practice of adoption was also seen in areas practicing Hinduism but not in places practicing Islam (Leonard, 2011).

Table 6: Years when Adoption was allowed in Western Europe

Country	Adult Adoption	Simple Child Adoption	Full Child Adoption
(West) Germany	1900	1900	1977
Sweden	1917	1917	1959
France	1804	1923	1939
England-Wales	Never acknowledged		1927
Italy	1865	1942	1967

Note: Simple and full adoption is distinguished by whether the ties with blood parents are cut (full) or not (simple). The table is taken from Mignot (2019) 335.

(Huebner, 2013).[23] This also confirms the people of ancient Rome were using adoption as a means of securing heirs. Such practices survived into the middle ages, where Germanic and Frankish people are known to have had various rituals for adoptions (Lynch, 2019).

Unlike East Asia, Western Europe began its general abandonment of adoption in the fourth century when the church made concerted efforts to discourage the institution. The institutional change was gradual but effective and the use of adoption beyond the early middle ages became rare in most regions.[24] It was only in the 19th century that laws began to accept adoption which was motivated by child welfare (see table 6). Thus, the two regions had very similar adoption institutions until a policy shock led to differences emerging by the medieval period.

The reasons for the institutional change has been a matter of conjecture. One is a theological argument against the motive behind adoption. Contemporaries argued that adoption can overshadow "divine adoption" and "inherited salvation" through baptism.[25] Also, the church discouraged emphasis on earthly concerns through adoption of "offspring of perjury". One fifth century priest, Salvian, made this point by stating that through adoption, "some very wretched and most unholy people, who are not bound by the bonds of children, nevertheless provide for themselves chains with which to bind the unfortunate necks of their own souls".[26] Despite the bible including a few cases of adoption, such as that of Moses, the idea was that adoptions motivated by wealth inheritance were wrong.

[23]Beyond the census, there are also many famous cases of adoptions among Roman emperors, including the infamous Nero, when the male line failed.

[24]A few cases of adoption include that by Joanna II, queen of Naples, 1414-35, adopting heirs when she was childless. There were also documented cases of adoption in France and Spain (Vassberg, 1998; Gager, 2014). Yet, these cases are of little concern for my purposes as it was neither widely practiced or used as a means of securing heirship. The high rates of extinction, as observed in many royal or elite lines, suggest adoption was not widespread.

[25]Gager (2014) 44.

[26]Goody (1983) 101.

Alternatively, Goody (1983) argues that the change was motivated by the financial benefit of the church. The shift in policy happened after laws changed allowing the church to own property from the 4th century. This encouraged the church to increase its properties by accepting "god's share" of bequests from childless families who willed it to them.[27] Interestingly, both of the major explanations show there was little awareness of the potential consequences for inequality.

The consequence of this institutional change in Europe was the emergence and widespread use of institutions that redistributed the land of the extinct. These systems were also highly intuitive ways of reallocating the lands. The system of wills let the deceased choose the reallocation of wealth and this tended to redistribute land highly unequally. The inheritance by heiresses is also unsurprising from a biological perspective. Together with the lack of adoption, these institutions led to a system of greater inequality.

Unfortunately, there is little evidence for land inequality from Ancient Europe although what little is available seems consistent with low inequality.[28] However the discussion shows many of the required conditions existed for a divergence in wealth inequality to occur between the East and West. One implication of this mechanism is that high inequality in Western societies may have been an unintended consequence of church policy stemming from the 4th century.

Conclusion

This paper began by questioning whether high wealth inequality was a universal or Western phenomenon. I showed in the first section of the paper that high wealth inequality seems to have been a Western phenomenon. Detailed data from 586 villages in Japan, 1640-1870, showed no trend in land inequality. Moreover, an estimate of landownership inequality for Japan as a whole suggests low inequality with Gini coefficients of 0.57. This low landownership inequality seems to have not been limited to this time and place. Fragmentary evidence from over a millennia across East Asia is also consistent with a very long-run equilibrium of low inequality. This contrasts with the finding in the literature that Western Europe converged towards high inequality in landownership, with Gini coefficients above 0.7. This trend was also a long-run phenomenon that preceded the black death. The west converged

[27] This may have been a highly successful source of revenue as one estimate states one third of the productive land in France was owned by ecclesiastical hands by the end of the seventh century (Goody, 1983).

[28] There is some data available from two rural village in Roman Egypt (Bagnall, 1992). The first is from 216 CE in the village of Philadelphia in the Fayum where the gini coefficient was 0.53 for private lands excluding the landless. The second is from 308/309 CE in the village of Karanis where the gini coefficient for private lands was 0.43 excluding the landless. These figures obviously cannot be assumed to have been typical but are consistent with low wealth inequality.

towards a society of landless laborers while the east converged towards a society of land-owning peasants.

I then attempted to explain why East Asian inequality was so different from Western Europe. I showed how adoption played a critical role in securing heirship and led to lands being kept in the male line in East Asian societies. In the particular case of Japan, I used a panel dataset of village censuses to show how adoptions led to a very different system of land transmissions across generations. I found that similar to Western Europe, households with all levels of wealth struggled to secure biological heirs. However, adoption was used as an heirship strategy in East Asia and it was clearly motivated by the lack of heirs. It also functioned very effectively at keeping land within the male line. Almost no households with more than the average level of land went extinct. It was only land poor and landless households, with marginal amounts of land, that went extinct.

In contrast, land transmissions were very different in Europe. Although similarly rich land data is not available, the genealogies of the rich suggest household extinction occurred in at least one quarter of cases per generation. Therefore, within a century, over three quarters of the lands must have been inherited outside the male line via social mechanisms, such as the marriage of an heiress or will. This led to a gradual wealth concentration as the wealth was highly unequally distributed upon a male line going extinct.

Finally I discussed the validity of this mechanism for explaining the different outcomes observed in Western Europe and East Asia. I show that institutions were actually very similar across Eurasia in ancient times. It was only due to the Christian church's teachings against adoption, beginning in the fourth century, that led to a gradual divergence in the use of adoption. By the early middle ages, adoption became rare in Western Europe while it continued to be practiced in East Asia. This mechanism places therefore places the decisions made by a small group of people in the church as the decisive turning point where Western Europe began its unintended transition into a high inequality region.

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Appendices

A Regional Composition of Edo Japan

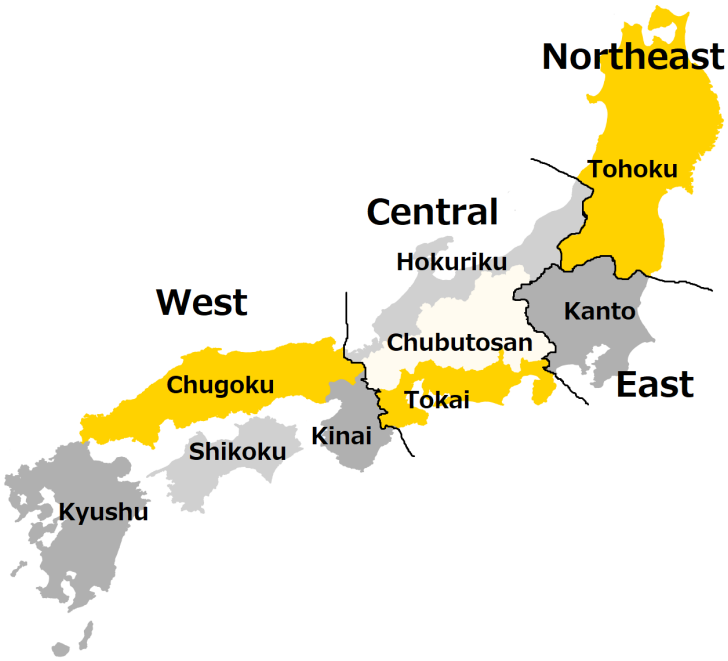

Figure A1: Defined Regions of Japan

The commonly used regional definition during the Edo period, the gokishichidō, were created based on roads stretching away from the former capital of Kyoto. This means the regions were not defined based on proximity which is desirable when grouping provinces. Therefore, I grouped provinces into region as defined by figure 2b which are closer to modern regional definitions.[29] These definitions make sense as they better adhere to natural or economic cohesion. For example, the Kinai region is centred around the Osaka plains and the Kanto region dominated by the Kanto plains, each of which are surrounded by mountainous terrain. On the other hand, other regions were less economically cohesive but were defined by features such as mountain ranges in the case of the Chubutosan region. These regions generally match the patterns in inequality making them useful geographic units. I also define larger geographical units, West, Central, East, and Northeast, but this is purely for purposes of presentation.

[29]There are a few notable tweaks. Chugoku refers to the combination of the *Saniin* and *Sanyō*. Kinai includes *Kii* province, which was traditionally grouped with Shikoku, to avoid complications in border. The Chubutosan region attempts to merge the current *Chubu* region with the traditional *Tosan* region. It attempts to capture the central mountain ranges so it notably includes *Kai* province.

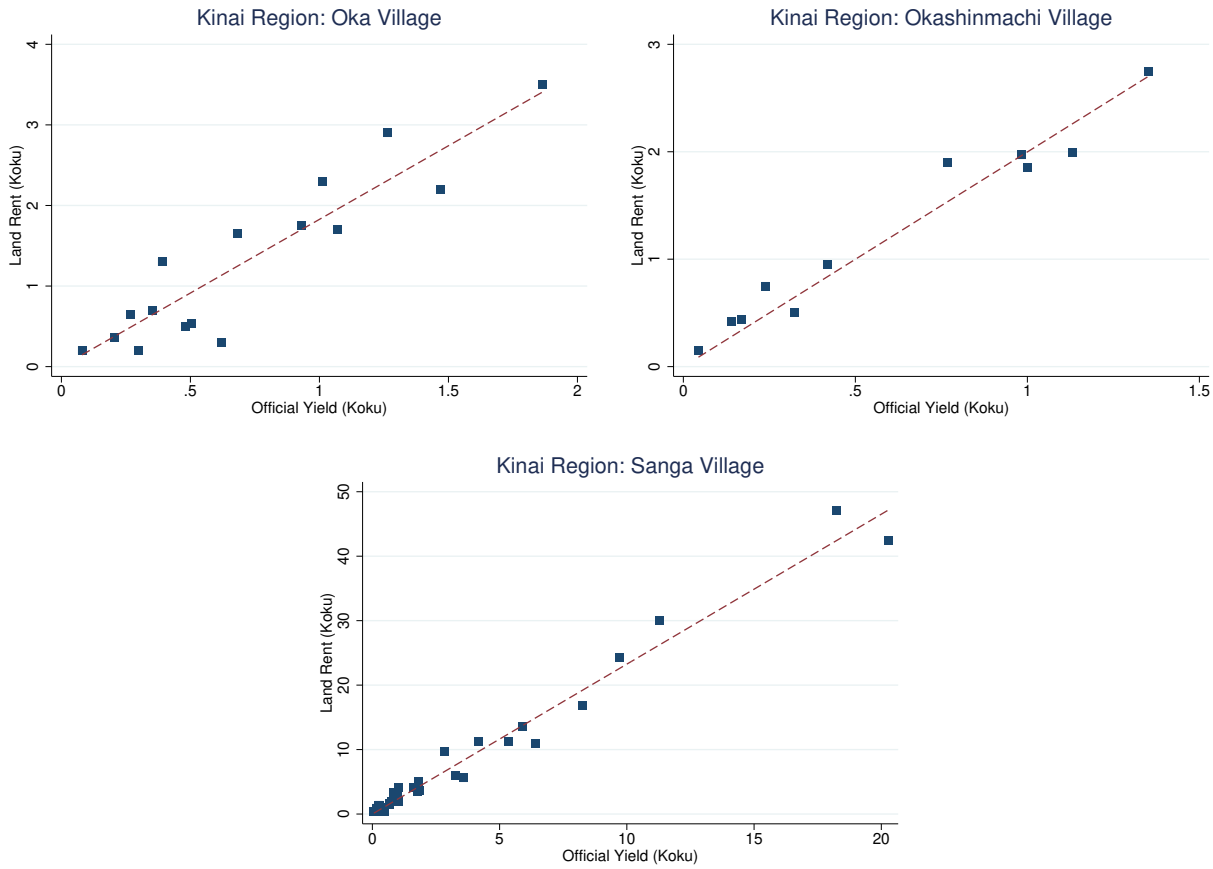

Figure A2: Rent by Land Plot

B Data

B.1 Testing the Accuracy of Official Yields as a Measure of Value

Figure A2 plots the observations from villages in which only land rent and official yields are available. The observed land rents adhere closely to the best linear fit that passes the origin. There is also no clear non-linear correlation between official landownership and true land rents.

B.2 Correlation of Inequality Measures

The main part of the analysis uses Gini coefficients due to the high correlation of all inequality measures as can be seen by the correlation matrix in table A1

Table A1: The Correlation of Inequality Measures

Gini	Prop. Landless	Share b20	Share b40	Share t20	Share t10
Prop. Landless	0.70				
Share b20	-0.79	-0.58			
Share b40	-0.92	-0.70	0.91		
Share t20	0.96	0.69	-0.68	-0.85	
Share t10	0.92	0.59	-0.59	-0.75	0.95

Source: Japanese inequality data

C Robustness of Trends

C.1 Non-linear Trends

One concern is that dynamics in inequality over time are not captured by a simple linear trend. In the case of Italy, the black death reduced inequality and broke the trend. In the case of Japan, major famines hit regions to various degrees in the 1730s, 1780s, and 1830s which could have impacted inequality. Could the noise caused by such events have concealed the underlying trend? To account for this, I attempt to capture how the slope of inequality trends were changing over time by estimating equation 4.

$$\frac{Gini_{v,d} - Gini_{v,d-k}}{k} = \sum_{d} \beta_d decade_d + \epsilon_{v,t} \tag{4}$$

I take one observation per village-decade by using the year closest to the middle of the decade. If there is an identical but changing trend among all villages, I should be able to detect patterns over time. I adjust for multiple testing using a Bonferroni correction.

Figure A3 graphically shows the results. No obvious pattern emerges with the slope meandering around zero change. The main concern, which was a hidden gradual increase in inequality, cannot be detected using this methodology.

C.2 Cross-Village Holdings

Another concern with the long-run estimates of village level inequality is that cross-village landownership may be increasing. This could result in increasing inequality because the rich tend to have more cross-village inequality. However, my data only includes land within the village held by villagers so this may not be detected in my measures of within-village inequality. One robustness test for this concern is to estimate the trend in the total land owned by residents of the village. If this is not increasing, this would suggest cross-village

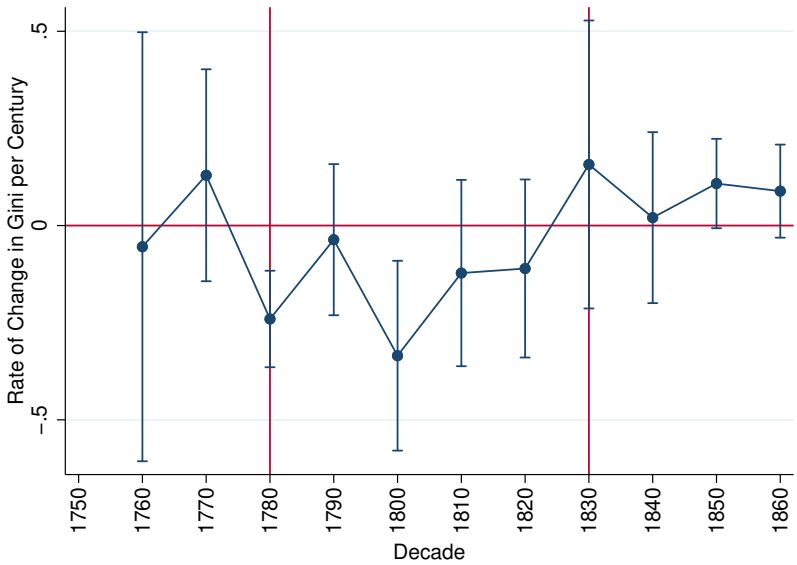

Figure A3: The Rate of Change in Gini in Japanese Villages

95% Confidence Interval plotted. Bonferoni adjusted standard errors. All observations weighted by village population. Vertilcal lines indicate the decade of famine.

holdings were not increasing. However, a negative effect in itself would not necessarily mean cross-village holdings were increasing. This could be driven by famines that are known to have depopulated the region and led to the abandonment of much land. Such a channel would also decrease total landownership among villagers but not increase cross-village holdings.

The results of a village fixed effect regression with the dependent variable being the total landownership are given in table A2. They show the lack of any statistically significant increase in cross-village holdings in Japan as a whole. The same can be said when I split the data by regions although the standard errors are much larger. There is no evidence that cross-village holdings are driving my results.

C.3 Weighting by Village-decade

I weight the data so that each village-decade gets the same weight. This does not change the results except to make the positive trend in central Japan insignificant.

Table A2: Trends in Total Land held by Villagers

	(1) All	(2) West	(3) Central	(4) East	(5) Northeast
Time	-0.036	0.023	-0.113	-0.068	-0.010
	(0.029)	(0.063)	(0.078)	(0.052)	(0.041)
Village FE	Yes	Yes	Yes	Yes	Yes
Obs	1861	458	282	387	734
Adj-R^2	0.479	0.322	0.305	0.548	0.270

The dependent variable is total land as a share of the maximum observed land. Standard errors are clustered by village. Observations are weighted by village-decade-total households. Time is in unit of centuries.
Source: Japanese inequality data

Table A3: Long Run Trends by Region using Village-Decade weight

	(1) All	(2) West	(3) Central	(4) East	(5) Northeast
Time	-0.026	-0.005	0.028	0.003	-0.074*
	(0.023)	(0.033)	(0.030)	(0.033)	(0.038)
Village FE	Yes	Yes	Yes	Yes	Yes
Obs	1861	458	282	387	734
Adj-R^2	0.899	0.965	0.940	0.819	0.850

Standard errors are clustered by village. Observations are weighted by village-decade. Time is in unit of centuries.
Source: Japanese inequality data

Table A4: Sample Averages: Preferred Weighting

			Wealth Owned by		
	(1)	(2)	(3)	(4)	(5)
	Gini	Share Landless	Bottom 40%	Top 20%	Top 10%
Land under Tenacny (%)	0.369***	-0.107***	-0.172***	0.351***	0.299***
	(0.026)	(0.037)	(0.011)	(0.023)	(0.021)
Obs	584	584	584	584	584
Adj-R^2	0.143	0.004	0.159	0.156	0.149

All villages are weighted by the number of households by region.
Source: Japanese inequality data

D Estimating Inequality Levels

I estimate the following regression.

$$Modern\ inequality_i = \alpha + \beta Tokugawa\ inequality_i + \epsilon_i \tag{5}$$

The modern inequality data comes uses data on the share of land under tenancy, 1883-1895. As the data was not available in all years for all prefectures in the data by Arimoto et al. (1984), due to different years in which the prefectures started creating the data, I use the first year in which the data becomes available. This means most data is from 1883 or 1884 and the mean year is 1884. With the exception of one prefecture, Toyama prefecture which only has data from 1895, the observations are before 1888. The use of the first year available is due to the higher likelihood of correlation with past inequality. My alternative inequality being measured within two decades of the collapse of the Tokugawa regime suggests the correlation is strong as landownership inequality changes very slowly.

For calculating the Tokugawa inequality variable, I first take sample averages of village inequality (doing all variables separately) while weighting data from each decade equally. This can be considered the general level of inequality in the village during this period if I assume inequality was stable. I then take the average of inequality of all villages in each prefecture using the weight of the average number of households in each village. Through this process, I calculate one inequality level per prefecture for areas where data is available.

The results of the regression are presented in table A4. I find a very strong statistical correlation between the two measures of inequality across time. This is unsurprising due to the proximity of the two periods and the slow moving nature of landownership inequality.

Using these results, I then predict Tokugawa period inequality and backwardly project inequality levels for Japan as a whole. This process is important because there is clear

Table A5: Regression Predictions of Tokugawa Inequality

Region	Gini	Share Landless	Wealth Owned by Bottom 40%	Top 20%	Top 10%
Kyushu	0.55	0.17	0.07	0.61	0.43
Shikoku	0.57	0.17	0.06	0.63	0.45
Chugoku	0.54	0.12	0.07	0.59	0.39
Kinai	0.63	0.28	0.04	0.68	0.48
Tokai	0.49	0.10	0.09	0.54	0.35
Tosanchubu	0.58	0.17	0.06	0.62	0.44
Hokuriku	0.61	0.22	0.04	0.68	0.49
Kanto	0.48	0.06	0.11	0.55	0.38
Tohoku	0.50	0.16	0.10	0.56	0.38
Japan	0.54	0.15	0.07	0.60	0.41

Source: Japanese inequality data

regional heterogeneity. Finally, I calculate the estimated inequality where I take the observed village averages as the inequality level if I have more than 3 observations. This number is arbitrary but using pure predictions (table A5) nor the averages of observed village inequality (table A6) nor weighting villages equally (table A7) leads to different conclusions suggesting this process is robust.

Table A6: Sample Averages

Region	Gini	Share Landless	Wealth Owned by Bottom 40%	Top 20%	Top 10%	Villages
Kyushu	0.54	0.08	0.08	0.60	0.42	5
Shikoku	0.35	0.00	0.15	0.51	0.29	1
Chugoku	0.52	0.11	0.07	0.58	0.38	26
Kinai	0.63	0.26	0.04	0.68	0.49	14
Tokai	0.49	0.08	0.10	0.55	0.37	40
Tosanchubu	0.61	0.21	0.05	0.65	0.47	59
Hokuriku	0.64	0.36	0.03	0.70	0.50	154
Kanto	0.50	0.06	0.10	0.57	0.39	193
Tohoku	0.44	0.12	0.12	0.51	0.34	94
Japan	0.53	0.13	0.08	0.59	0.40	586

All villages are weighted equally for regional averages. For the overall average, I weigh the regional average by population in 1798.
Source: Japanese inequality data

Table A7: Estimated Tokugawa Inequality: Alternative Weighting

Region	Gini	Share Landless	Wealth Owned by Bottom 40%	Top 20%	Top 10%
Kyushu	0.58	0.18	0.06	0.63	0.44
Shikoku	0.60	0.17	0.06	0.64	0.45
Chugoku	0.59	0.17	0.06	0.64	0.45
Kinai	0.59	0.17	0.06	0.64	0.45
Tokai	0.59	0.18	0.06	0.63	0.45
Tosanchubu	0.58	0.18	0.07	0.62	0.44
Hokuriku	0.61	0.17	0.05	0.65	0.46
Kanto	0.58	0.18	0.06	0.62	0.44
Tohoku	0.54	0.19	0.08	0.58	0.41
Japan	0.58	0.18	0.06	0.63	0.44

All villages are weighted in the estimation process.
Source: Japanese inequality data

E Additional Wealth Inequality Estimate: France in 1825

I use data tabulated in Heywood (1981). This is a lower bound estimate because I assume no within group inequality. I assume the lowest bracket of people (0-20 Francs) owned 5 Francs worth of land. This is arbitrary but this is within a subset of numbers for the 0-20 Franc category that is consistent with the share of land value owned by each class.

F The Equal Field System and Beyond in East Asia

The earliest reliable evidence on wealth inequality in China comes from the equal fields system introduced in 485 by the Northern Wei then continued by the Sui and Tang dynasties up to the year 780. During the Tang period, land was distributed to males of age 15-59 with 80 *mu* of personal share lands and 20 *mu* of permanent tenure lands for 100 *mu* in total.[30] The personal share lands reverted to the state upon death while the permanent tenure lands could be inherited to heirs. The amount of allotments were never more than ideals and lands were never fully distributed to everyone due to land scarcity. However, the total allocation of 100 *mu* were also conceptualized as upper bound landownership for peasants and prevented the accumulation of landownership (Mitani, 2015). Overall, the system tended to keep society relatively equal.

The Japanese also adopted this system via the *Handen* system of the 7th to 10th centuries.[31] The allotted lands under this system, known as *kubunden*, were often paddy fields and distributed based on the peasant's age, sex, and class.[32] Specifically, were two classes of peasants; the *ryō* were standard peasant households and comprised the vast majority while the *sen* were the lower class who were similar to the unfree peasants of England. Males of the *ryō* class got 2 *tan* of land while females got two thirds of males. The *sen* class got one third of the *ryō* peasants in their respective age-sex category (see table A8). The maintenance of this system required large-scale population surveys that occurred every 6 years to register all people. Any deaths resulted in confiscation of land, while those who were turned older than 6 were allotted lands.[33] The system was far from perfect and there are known cases

[30] See Von Glahn (2016) 185

[31] The accurate dates of the policy remain unknown but the earliest date may be 652. The policy weakened in 806 and collapsed by the mid 10th century. See Mitani (2015).

[32] Paddy fields comprised perhaps 82% of cultivated land at this time (Takashima, 2016).

[33] As surveys occurred every 6 years, those who were older than 6 must be registered for the second time. This allowed the identification of such individuals. This also meant that some peasants got lands as early as 6 to as late as 11 years of age.

Table A8: The allotments under the *handen* system

Class	Sex	Age	Allotment	Estimated Yield net of tax and seed
Ryo	Male	6+	2 *tan*	2.25 *koku*
Ryo	Female	6+	$\frac{4}{3}$ *tan*	1.5 *koku*
Sen	Male	6+	$\frac{2}{3}$ *tan*	0.75 *koku*
Sen	Female	6+	$\frac{4}{9}$ *tan*	0.50 *koku*

Tan units are in Nara tan which are 20% larger than the current tan. Estimates of yield are in current koku units (a local unit measuring value in volume of rice) assuming 315 soku of yield per Nara cho, 15 soku of taxation per cho, and 20 soku of seed per cho.

where allotted lands were far away from the homes of residents (Iyanaga, 1980).[34] Moreover, land quality must have differed to some degree. Yet, the system did give all people rights to cultivate land.

How much land rent net of taxation could people earn from this system? There is some evidence from cases of land rental at this time. As government lands (*koden*) could be rented out in return for 20% of expected yields, similar rates of land rents must have been the norm in private fields (Iyanaga, 1980).[35] Taxes are estimated to have been perhaps 5-7% of yields so there would have been 13-15% of yield being earned by peasants from land rights (Sawada, 1972). Although these figures are rough estimates due to the limited nature of the sources, the clear finding is that equality in land distribution was a feature of Japan in the 7th-10th centuries. As it is unclear how lands were distributed preceding the *handen* system, it is unknown whether equality was driven by state policy or if policy simply acknowledged widespread equality.

What is the available evidence for land distributions between the equal field system and early modern time? In the case of China, most estimates were compiled in a study by Von Glahn (2016). Data from the household ranking system in the 11th century indicate only 33% of households were landless. In the period 1706–1771, the Gini coefficient of landownership in acreage in Huolu county, Hebei province, hovered around 0.6. This includes landless households who composed 16–26% of households at any time. There is no clear trend in inequality. By the republican period, there are a number of figures for landless ranging from 17% by Buck (1937) and 33% by agricultural surveys.[36] Estimates of the share of land under tenancy range from 29-42% which are low and comparable to Japan in the

[34] I emphasize that my argument rests on the right of the peasant to the land's share of income, rather than the legal definition for which there is considerable debate.

[35] The rent depended on the timing of payment in the system of *chiso*. If rent was paid before the harvest, the rent was 20% of yields. If paid after the harvest, an additional interest rate was collected.

[36] The figures by Buck are an under-estimate as they most likely over-surveyed literate peasant who tended to have land.

1880s (Esherick, 1981).[37] These estimates may over-estimate inequality because many are unlikely to account for the multilayered ownership of lands such as topsoil rights that were held be tenants. In terms of trends, Brandt and Sands (1990) investigates inequality in the republican period to find little change in inequality since the 1880s using the limited available data.

In the case of Japan, after the collapse of the *handen* system, a feudal system based on privately held estates (*shōen*) were established. Land rights were distributed according to various rights called *shiki*. The lord was on the top of the hierarchy of ownership, while peasants also held rights over surplus net of tax (as the *sakute*) or use rights (as the *sakunin*) (Inagaki, 1981; Nishitani, 2006). Unfortunately there are few sources to study land distribution beyond the top hierarchy of elites and temples until the 17th century. Yet, it remains the case that peasants held landownership rights within this system through which relative equality could have been sustained. Moreover, unskilled wages remained exceptionally low in this period at just 10 copper coins which could perhaps sustain 1-1.5 people in rice or perhaps double the number using inferior grains (Bassino et al., 2011). For the population to have been sustained under such a low wage environment, it seems likely that most peasants earned supplementary incomes in the form of landownership incomes as can be seen in subsequent periods (Kumon et al., 2020).

Overall, the available evidence from East Asia over the very long-run are weak but are consistent with the hypothesis that this region was equal relative to Western Europe.

G Adoption in Other Japanese Regions

This section attempts to show external validity of the findings on adoption within Japan. Table A9 shows the evidence on adoption in other Japanese villages within the secondary literature. I limit the figures to male heirs because female heirs were often temporary household heads until a male head was found. They show high adoption rates ranging 18-32%. Adoption rates were likely lower in central Japan due to higher birth rates meaning less need for adoption. The evidence is again rather limited due to the need for continuous linked series of censuses that are rare but adoption itself has been widely documented to the West of the Kansai region (the region with Kyoto and Osaka) and it likely functioned similarly here (Hayami, 1973; Kurosu and Ochiai, 1995; Toishi, 2016). One limitation is that little is

[37] Brandt and Sands (1990) computes the Gini coefficient for acreage including the 33% of landless households in the 1930s to have been 0.72. This estimate is an upper bound estimate of inequality levels as the country grew both wheat and rice with very different acreage requirements. Rice based lands could have more than triple the land value compared to wheat. Thus, even a perfectly equal distribution of land in value will have unequally distributed land acreage.

Table A9: Heirs by Region

Prefecture	Central Japan	Northeastern Japan			
	Gifu	Fukushima		Yamagata	
	Nishijo	Shimomoriya	Niita	Yoshikawa	Tsukanome
	1773-1870	1716-1869	1720-1870	1758-1845	1814-55
Male Heirs					
Biological son	75%	51%	53%	71%	67%
Adopted son	18%	32%	25%	23%	22%
Others	7%	17%	22%	5%	10%

Sources: (Ofuji, 1996; Okada, 2006)
Note: Two more villages from Yamagata are available on Ofuji (1996) but the numbers are similar. They have not been included for space limitations but adoption rates were 16% and 22%.

known about Western Japan, where birth rates were higher and adoptions may have consequently been less common, although the redistribution of children among families is known to have occurred (Ochiai, 2004; Ōnuma, 2018). Despite this limitation, it seems likely that the many, if not all, Japanese regions used adoption as an heirship strategy that helped retain lands within the male line.

H Adoption and Male Heirship

One issue with table 4 is that having male successors requires them to survive to adulthood. However, I do not control for child age. I construct alternative independent variable where I age adjust the number of male heirs by accounting for potential mortality using Life tables from Meiji Japan, 1891-98. I also cannot account for heirs who left the village and may be alive. However, I can add male heirs who may be potentially alive outside the village. I adjust for these in table A10 and find the results are the same.

Table A10: Alternative Specifications of Adoption and Male Heirship

		(1)			(2)	
	OLS	1st Stage	2nd Stage	OLS	1st Stage	2nd Stage
Age Adjusted Heirs	-0.126***		-0.209**			
	(0.021)		(0.098)			
Age + Leaver Adjusted Heirs				-0.089***		-0.162**
				(0.018)		(0.078)
Landholdings (Koku)	0.002	0.007	0.001	0.002	0.020	0.002
	(0.003)	(0.017)	(0.005)	(0.004)	(0.025)	(0.006)
=1 if First Child Male		0.425***			0.549***	
		(0.117)			(0.142)	
Village FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	350	177	177	347	177	177
Adj-R^2	0.086	0.055	0.069	0.054	0.064	0.006
First Stage F-stat			13.118			14.971

Huber-White robust standard errors are in parenthesis. $*p < 0.1, **p < 0.05, ***p < 0.01$
The dependent variable is whether there is an adopted heir within the household at the end of reproduction. Heir refers specifically to male heirs. Koku refers to the local unit in volume of rice.
Source: DANJURO database

I Sources

I use village census data collected by the Population and Family History Project at Reitaku University and the DANJURO database administered by Hiroshi Kawaguchi. In addition, I digitized data from the following local histories.

Anan shishi hensan iinkai (1989) "Anan shiryō hen kinsei" *Anan shi*

Atsugi shi kyōiku iinkai shōgai gakushūbu bunkazai hogoka (2009) "Atsugi shishi Kinsei shiryō hen 5" *Atsugi shi*

Bitchū chōshi henshū iinkai (1974) "Bitchū chōshi shiryō hen" *Bitchū chōshi kankō iinkai*

Chiba kenshi hensan shingikai (1969) "Chiba ken shiryou 2" *Chiba ken*

Chita shishi hensan iinkai (1984) "Chita shishi shiryōhen 4" *Chita shi*

Chiyoda chō (1990) "Chiyoda chōshi kinsei shiryōhen" *Chiyoda chō*

Ebina shi (1994) "Ebina shishi shiryō hen kinsei 1" *Ebina shi*

Ebina shi (1996) "Ebina shishi shiryō hen kinsei 1" *Ebina shi*

Enzan shishi hensan iinkai (1995) "Enzanshishi shiryōhen 2" *Enzan shi*

Fukukawa shishi hensan iinkai (2004) “Furukawa shishi 8” *Furukawashi*
Fuchū shi (1988) “Fuchū shishi shiryō hen 2” *Fuchū shi*
Fujimi shishi kyōiku iinkai (1990) “Fujimi shishi shiryōhen 4” *Fujimi shishi*
Fujino machi (1994) “Fujino machishi shiryō hen jyō” *Fujino machi*
Fujioka shishi hensan iinkai (1990) “Fujioka shishi shiryō hen kinse” *Fujioka shi*
Fukuroi shishi kyōiku iinkai (1975) “Fukuroi shishi shiryō 2” *Fukuroi shishi kyōiku iinkai*
Fukushima ken (1965) “Fukushima kenshi 8” *Rinsen shoten*
Fukushima ken (1985) “Fukushima kenshi 9” *Rinsen shoten*
Fukushima ken (1986) “Fukushima kenshi 10 jyō” *Rinsen shoten*
Fukushima ken (1986) “Fukushima kenshi 10 ge” *Rinsen shoten*
Fukushima shishi hensan iinkai (1968) “Fukushima shishi 8” *Fukushima shi kyōiku iinkai*
Fukushima shishi hensan iinkai (1971) “Fukushima shishi 9” *Fukushima shi kyōiku iinkai*
Fukushima shishi hensan iinkai (2000) “Fukushima shishi shiryō sōsho 76” *Fukushima shi kyōiku iinkai*
Fujiidera shi (1985) “Fujiidera shishi 7” *Fujiidera shi*
Fujiyoshida shishi hensan iinkai (1994) “Fujiyoshida shishi shiryōhen 4” *Fujiyoshida shi*
Fukui shi (2004) “Fukui shishi shiryōhen 8” *Fukui shi*
Futsu shishi hensan iinkai “Futsu shishi shiryō shū 1” *Futsu shi*
Gifu ken (1968) “Gifu kenshi shiryōhen kinsei 4” *Gifu ken*
Gifu shi (1978) “Gifu shishi shiryō hen kinsei 2” *Gifu shi*
Haibara chōshi hensan iinkai (1992) “Shizuoka ken Haibara chōshi shiryō 3 jyō” *Haibara chō kyōiku iinkai*
Handa shishi hensan iinkai “Handa shishi shiryō hen 5” *Handa shi*
Hanno shishi henshū iinkai (1984) “Hanno shishi shiryōhen 8” *Hanno shi*
Hasuda shishi kyōiku iinkai shakai kyōiku ka (2000) “Hasuda shishi kinsei shiryō hen 1” *Hasuda shishi kyōiku iinkai*
Hidaka shishi henshū iinkai (1996) “Hidaka shishi kinsei shiryō hen” *Hidaka shi*
Hiraizumi chōshi hensan iinkai “Hiraizumi chōshi shiryō hen 2” *Hiraizumi chō*
Hiratsuka shi (1983) “Hiratsuka shishi 3” *Hiratsuka shi*
Honkawane chōshi hensan iinkai (2000) “Honkawane chōshi shiryō hen 2” *Honkawane chō*
Ibaraki kenshi hensan kinsei shi daini bukai (1971) “Ibaraki ken shiryō kinsei shakai keizai hen 1” *Ibaraki ken*
Ibaraki kenshi hensan kinsei shi daini bukai (1976) “Ibaraki ken shiryō kinsei shakai keizai hen 2” *Ibaraki ken*
Ibigawa chō (1970) “Ibigawa chō shi shiryōhen” *Ibigawa chō*
Imaichi shishi hensan senmon iinkai (1973) “Imaichi shishi shiryō hen kinsei 1” *Imaichi-shi*

Ina sonshi hensan iinkai (2003) “Ina sonshi 3” *Inamura*
Inoue, Kazuo & Gotō, Kazuo (1986) “Mikawa no kuni Hoi chihō shumon ninbetsu aratamechō” *kokusho kankō kai*
Iruma shishi hensan shitsu (1986) “Iruma shishi kinsei shiryō hen ” *Iruma shi*
Iwaki-shishi hensan iinkai (1972) “Iwaki-shishi 9” *Iwaki-shi*
Iwatsuki shi (1982) “Iwatsuki shishi kinsei shiryō hen 4” *Iwatsuki shi*
Iwai shishi hensan iinkai (1994) “Iwaishishi shiryō hen kinsei” *Iwaishi*
Izumozaki chōshi hensan iinkai (1988) “Izumozaki chōshi shiryō hen 2” *izumozaki chō*
Kadoma shi (1997) “Kadoma shishi 3” *Kadoma shi*
Kaizu chō (1970) “Kaizu chōshi shiryōhen 2” *Kaizu chō*
Kami chōshi henshū iinkai “Kami chōshi shiryō hen” *Kami chō*
Kamifukuoka shishi hensan iinkai (1997) “Kamifukuoka shishi shiryōhen 2” *Kamifukuoka shi*
Kaminokawa chōshi hensan iinkai (1979) “Kaminokawa chōshi shiryōhen kinsei” *Kawanokawa chō*
Kamogawa shishi hensan iinkai (1991) “Kamogawa shishi shiryōhen kinsei 1” *Kamogawa shi*
Kanagawa ken kenminbu kenshi henshū shitsu (1983) “Kanagawa kenshi shiryōhen 4” *Kanagawa ken*
Kanagawa ken kenminbu kenshi henshū shitsu (1973) “Kanagawa kenshi shiryōhen 6” *Kanagawa ken*
Kanagawa ken kenminbu kenshi henshū shitsu (1976) “Kanagawa kenshi shiryōhen 8” *Kanagawa ken*
Kanagawa ken kenminbu kenshi henshū shitsu (1979) “Kanagawa kenshi shiryōhen 8 (2)” *Kanagawa ken*
Kanuma shishi hensan iinkai (2002) “Kanuma shi kinsei 2 bessatsu” *Kanuma shi*
Kariya shishi hensan henshū iinkai (1992) “Kariya shishi 6” *Kariya shi*
Katsuragi Chōshi henshū iinkai (1988) “Katsuragi chōshi kinsei shiryō hen” *Katsuragi chō*
Kawaguchi shi (1985) “Kawaguchi shishi kinsei shiryō 1” *Kawaguchi shi*
Kawajima chō (2005) “Kawajima chōshi shiryōhen kinsei 1” *Kawajima chō*
Kawakami sonshi kankōkai “Kawakami sonshi shiryōhen” *Kawakami murashi kankōkai*
Kawamata chō kyōiku iinkai “Kawamata chōshi shiryō 5” *Kawamata chō*
Kazo shishi hensanshitsu (1984) “Kazo shishi shiryōhen 1” *Kazo shi*
Kitakami shi (1983) “Kitakami shishi 9 ” *Kitakami shishi kankōkai*
Kohama shishi hensan iinkai (1981) “Kohama shishi shyoke monjyo hen 3” *Kohama shi*
Komae shi (1979) “Komae shi shiryōshū 9” *Komae shi*
Kōri chōshi hensan iinkai (1992) “Kōri chōshi 6” *Kōri chōshi shuppan iinkai*
Kōriyama shi (1981) “Kōriyama shishi 8” *Kōriyama shi*

Kosai shishi hensan iinkai (1979) “Kosai shishi shiryōhen 1” *Kosai shi*
Kosai shishi hensan iinkai (1986) “Kosai shishi shiryōhen 6” *Kosai shi*
Koshigaya shi (1974) “Koshigaya shishi 6” *Koshigaya shi*
Kōta chō kyōiku iinkai (1994) “Kota chōshi shiryōhen 1” *Kota chō*
Kozakawa chōshi hensan iinkai (2005) “Kozakawa chō shi Kinsei shiryō hen” *Kozakawa chō*
Kōzan chōshi hensan iinkai (2004) “Kōzan chōshi shiryōhen 2” *Kōzan chō*
Kuki shi kyōiku iinkai (2013) “Kuki shi Kurihashi chōshi” *Kuki shi kyōiku iinkai*
Kumamoto shishi hensan iinkai (1994) “Shin Kumamoto shishi shiryō hen 3” *Kumamoto shi*
Maihara chōshi hensan iinkai (1999) “Maihara chōshi shiryō hen” *Maihara chō*
Makabe machishi hensan iinkai (1990) “Makabemachi shiryō kinsei hen 3” *Makabe machi*
Matsubara shishi hensan iinkai (1974) “Matsubara shishi 4” *Matsubara shi*
Matsushima chōshi (1989) “Matsushima chōshi shiryō hen” *Matsushima chō*
Mino kashige shishi (1977) “Mino kashige shishi shiryō hen” *Mino kashige shi*
Minō shishi henshū iinkai (1970) “Minō shishi shiryō hen 4” *Minō shi*
Misato shishi hensan iinkai (1990) “Misato shishi 2” *Misato shi*
Miyama chōshi hensan iinkai (1973) “Miyama chōshi shiryōhen” *Miyama chō*
Miyamura shi henshū iinkai (2003) “Miyamura shi shiryōhen 1” *Miyamura*
Miyazaki ken (1994) “Miyazaki kenshi shiryōhen kinsei 3” *Miyazaki ken*
Monzen chōshi hensan senmon iinkai “Shinshū Monzen chōshi shiryō hen 3” *Ishikawa ken Monzen machi*
Motosu chō (1975) “Motosu chōshi shiryōhen” *Motosu chō*
Nagano ken (1973) “Nagano kenshi kinsei shiryō hen 5-1” *Nagano kenshi kankō iinkai*
Nagano ken (1975) “Nagano kenshi kinsei shiryō hen 8” *Nagano kenshi kankō iinkai*
Nagano ken (1977) “Nagano kenshi kinsei shiryō hen 4-1” *Nagano kenshi kankō iinkai*
Nagano ken (1978) “Nagano kenshi kinsei shiryō hen 2-1” *Nagano kenshi kankō iinkai*
Nagano ken (1981) “Nagano kenshi kinsei shiryō hen 7-1” *Nagano kenshi kankō iinkai*
Nagano ken (1989) “Nagano kenshi kinsei shiryō hen 6” *Nagano kenshi kankō iinkai*
Nagareyama shiritsu hakubutsukan (1987) “Nagareyama shishi kinsei shiryō hen 1” *Nagareyama shi*
Nagareyama shiritsu hakubutsukan (1988) “Nagareyama shishi kinsei shiryō hen 2” *Nagareyama shi*
Nakajima chōshi hensan senmon iinkai (1995) “Nakajima chō shi shiryō hen” *Nakajima chō*
Nakajyō chōshi hensan iinkai (1984) “Nakajyō chōshi shiryō hen 2” *Nakajyō chō*
Narashino shishi henshū iinkai (1986) “Narashino shishi 2” *Narashino shi*
Narita shishi hensan iinkai (1977) “Narita shishi kinsei hen shiryōshū 4 ge” *Narita shi*
Nariwa chōshi henshū iinkai (1994) “Nariwa chōshi shiryō hen” *Nariwa chō*

Nasu, Kokichi (2005) "Yoshikawa mura shūmon ninbetsu aratame chō Volumes 1-3" *Nishikawa chō*
Niigata ken (1981) "Niigata kenshi shiryōhen 6" *Niigata ken*
Niigata ken (1981) "Niigata kenshi shiryōhen 7" *Niigata ken*
Niigata shishi hensan kinseishi bukai (1993) "Niigata shishi shiryō hen 4" *Nigata shi*
Niitsu shishi hensan iinkai (1987) "Nitsu shishi shiryōhen 2" *Nitsu shi*
Nishiaizu machishi hensan iinkai (1994) "Nishiaizu machishi 4 jyō" *Nishiaizu machishi kankō iinkai*
Nitta chōshi hensanshitsu (1987) "Nitta chōshi 2" *Nitta chō*
Ōgaki shi (1968) "Shinshū Ōgaki shishi shiryō hen 1" *Ōgaki shi*
Ōgaki shi (2010) "Ōgaki shishi shiryōhen kinsei 2" *Ōgakishi*
Ogawa chō "Ogawa chō no rekishi shiryō hen 4" *Ogawa chō*
Oguchi sonshi hensan senmon iinkai (1978) "Oguchi sonshi 1" *Oguchi mura*
Ōhara chōshi hensan iinkai (1988) "Ōhara chōshi shiryōshū 1" *Ōhara chō*
Ōhara chōshi hensan iinkai (1989) "Ōhara chōshi shiryōshū 2" *Ōhara chō*
Ōhara chōshi henshū iinkai (2006) "Ōhara chōshi shiryōhen chū" *Mimasaka shi*
Ōimachi shi (1988) "Ōimachi shi shiryōhen 2" *Ōimachi*
Okegawa shi (1982) "Okegawa shishi 4" *Okegawa shi*
Ōmiya chōshi hensan iinkai (1979) "Ōmiya chōshi shiryō hen" *Ōmiya machi*
Ono chō (1988) "Ono chōshi shiryōhen 1 ge" *Ono chō*
Ono shishi hensan senmon iinkai "Ono shishi 5" *Ono shi*
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