The Deep Roots of Inequality

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Abstract

The equality of East Asian societies relative to Western Europe has been well documented in the late 19th century. This paper shows that such regional patterns may extend back over 1000 years by comparing rural wealth inequality in Japan and China to Western Europe. I first present new evidence of wealth inequality from early modern Japan, 1650-1870, using a new dataset of household landholdings across 591 villages. Two facts emerge: First, Japan was highly equal relative to Western Europe, with Gini coefficients averaging 0.5 compared to 0.7-0.9 in contemporary Western Europe. Second, Japanese equality was persistent compared to Western Europe where inequality trended upwards. Further, I show evidence that ancient China and Japan adopted an equal field system which kept society equal compared to medieval Europe which was already unequal circa 1300. This regional pattern of inequality had deep roots and persisted until the industrial revolution.

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The steady rise in economic inequality observed in many societies has generated new historical narratives claiming extreme inequality as destiny (Piketty, 2014; Scheidel, 2017). The only cause for celebration were catastrophic shocks, namely mass-mobilization warfare, transformative revolutions, state collapse, and large-scale plagues, which temporarily redistributed wealth towards the poor.[1] Indeed, the available historical evidence show that wealth inequality was increasing in pre-industrial Italy, Netherlands, and Sweden (Alfani, 2015; Alfani and Ryckbosch, 2016; Alfani and Ammannati, 2017; Bengtsson et al., 2018). Moreover, much of Europe was highly unequal by 1800, with landless peasants being the norm and Gini-coefficients ranging from 0.7-0.9. Yet, this narrative sits uneasily with findings from East Asia in the 19th – early 20th century where inequality was low. Based as it is on European evidence, could our understanding of inequality be a narrative of Western European inequality rather than a universal narrative?

In this paper, I show that East Asia may have been persistently equal for over 1000 years preceding the industrial revolution which runs against the currently established narrative on historical inequality. I first use data from village registers in Japan, 1650-1870, that listed the landholdings of all households within villages. Despite the feudal system in this period, peasants had landholding rights which gave the holder the right to land rent net of taxation in addition to rights to sell or transfer lands.[2] Using landholdings as a measure of wealth, I show that Gini coefficients averaged 0.5 and over 87% of households held land. Moreover, there is no upward trend in inequality unlike much of Western Europe. Japanese wealth inequality in this period had a persistent equality. It only began trending upwards as the country began to industrialize.

Further, I compile fragmented evidence of equality in much of East Asia from 700-1940. I show evidence that the *Handen* system in 7th-10th century Japan distributed land equally among peasants. This system was copied from the equal fields system in China, which also attempted to equally distribute lands. Although this system was abandoned in both countries by the 10th century, the available fragmentary evidence on land distributions always indicate equal societies relative to Western Europe. The available evidence is imperfect, with inequality measures missing for many centuries, but it is difficult to align the available facts with the view that inequality always converges toward a high level. Therefore, this paper raises a new conjecture that East Asia was characterized by persistent equality for at least the millennia preceding the pre-industrial period, distinguishing it from Western Europe (see

[1] Scheidel (2017) is a proponent of this view, and states on p.444 "For thousands of years, history has alternated between long stretches of rising or high and stable inequality interspersed with violent compressions."

[2] As economists, we are interested in the distribution of land rents and the lack of full landownership due to feudalism is not an issue here.

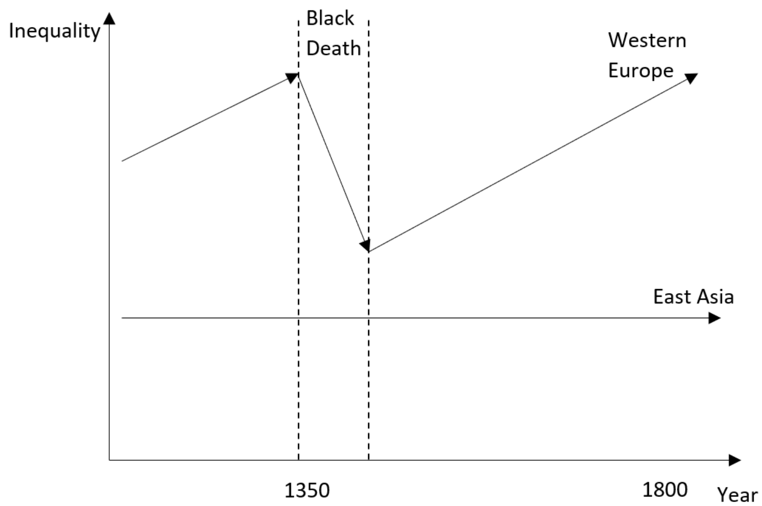


Figure 1: An Alternative Hypothesis of Long-run Inequality

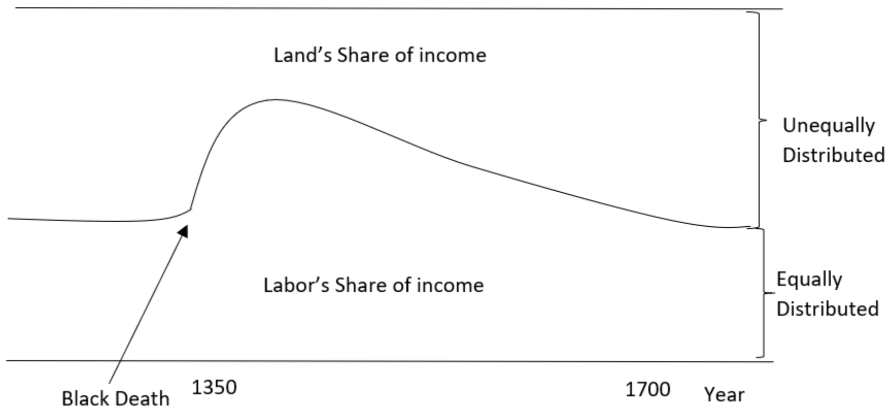
figure 1). There are large implications of these findings for long-run economic development, culture, and institutions among other things (Kumon, 2018).

The paper makes a number of contributions. First, the idea of equality in East Asia compared to Western Europe being a long-run phenomenon is novel. The past literature had noted the relative equality of East Asia from the 19th century, where evidence is more abundant (Milanovic et al., 2010; Milanovic, 2018). However, few studies had compared regions across the very long run.[3] Scheidel (2017) attempted this but concluded that Japan was an idiosyncratic case while China had increasing inequality combined with periodic redistributions due to dynastic cycles. However, his evidence was based on narratives while I show the available numbers indicate persistent equality. Although the evidence is wanting when it comes to the dynastic cycles hypothesis, the broader point is that East Asia as a whole seems to have been persistently equal.

Second, this paper uses new data on pre-industrial inequality from both Japan and England. In the case of Japan, I use the landholdings listed in village population registers which accurately captures inequality within the rural economy where over 87% of the population resided.[4] This is different from the study by Saito (2015) that looks at income inequality within the *Choshu* domain across social classes. His methods do not account for inequality within the peasant class which is the interest of this paper. I am not the first to use this source but due to the local nature of population registers, many Japanese historians had used these sources to study inequality at the local level. Nakamura (1968) was a typical case

[3]This may be due to the complexities of rights surrounding land with land ownership failing to capture the distribution of land rents in many pre-industrial societies.

[4]For urbanization rates, see Saito and Takashima (2016).



inequality.png

Figure 2: A representation of pre-industrial Inequality

of such studies, looking at the countryside surrounding Osaka to argue for increasing inequality.[5] I go beyond the limited local scope of such studies by collecting registers from 591 village across much of the country to create a nationally representative sample. I show the earlier Japanese literature was wrong with Japanese inequality levels looking highly stable, at least until the industrial revolution.

In the case of England, the past literature failed to fully account for various rights over land when measuring inequality (Lindert, 1987). Thus, a narrative popularized by Marx (1867) arguing for landed peasants being proletarianized by enclosure has lingered in the minds of historians. I compile data from 591 parliamentary enclosure acts from the 18th-19th centuries that list the rights of all rights holders and show land was unequally distributed everywhere. By adding a new case study from Western Europe to the well documented case of Italy (1307-1809), I strengthen the argument that high inequality in Western Europe seems to be a phenomena since at least the medieval period to the industrial revolution.

Pre-Industrial Inequality

In the pre-industrial period wealth inequality was the driver of all inequality because labor income was relatively evenly distributed (see figure 2). In these agricultural economies skill premiums were small with typical skilled workers in rural Japan earning perhaps 2.6 times more in wages.[6] Moreover, such skilled workers were rare. Hence the labor's share of income was very equally distributed compared to the modern day and its inequality can be ignored. An implication is that wealth inequality is a very good measure of total inequality.

[5] This phenomenon in Japan is popularly known as the *Nominso Bunkai* whereby peasants split into a land rich upper class and a land poor lower class.

[6] Saito (2005)

My analysis of wealth inequality translate well to income inequality.

There were three channels through which income inequality evolved (see figure 2). The first were changes in the share of labor's share of total income. This could be affected by huge shocks such as the black death (which did no hit Japan) after which wages are known to have risen. In Japan wages appear to have stayed low meaning this was a fairly static channel. The second channel was through changing purchasing powers of different income classes such as through a decrease in the price of luxuries (Hoffman et al., 2002). The third channel was changes in the distribution of wealth. The focus of this paper is the third channel.

Some of the available measures of wealth inequality before the industrial revolution, including the results of this study for Japan, are given in table 1. Before interpreting, a few notes of caution are required. First, the defined type, unit, and region of measurement vary. Many estimates based on tax records did not include those without wealth. Also, some are based on households while others on male adults. Some of these include all households, both urban and rural, while others are only rural. Of these, the biggest concern is the lack of landless which is true in the case of Italy whose estimates are significant underestimates.

Second, there is potential measurement error due to rights over land rents other than land ownership such as land use rights. For instance, England had copyholding rights that were distinct from land ownership but nonetheless gave the holders access to land rents through subleases. Also commons, which was lands owned by communities, existed in many societies.[7] These lands could supplement incomes but I later show that accounting for this does not change the conclusion in the case of England.

Given these caveats, the biggest finding is that Gini coefficients for wealth or land in rural parts of Europe ranged between 0.7-0.9 while East Asia appears far more equal.[8] The landless were dominant in Europe (with perhaps the exception of Sweden). In 16th century, Holland where rural inequality measures are unavailable, Van Bavel (2005) shows that up to 60% of the rural population were reliant on wage labor. Measures of income inequality, which should be highly correlated with wealth inequality, also sketch out similar patterns (Milanovic et al., 2010). The consistency of these results brings doubt that measurement error may have decisively affected these findings. The question is why wealth inequality never converged to high levels everywhere. Was there perhaps a major difference in inequality dynamics which

[7]For instance, Japanese villages had commons called *iriaichi* where peasants could collect fertilizer in the form of dried grass or firewood. Distinct from this is common fields studied by Brown (2011). Such lands had clear ownership rights over rents and are measured within the dataset used in this paper.

[8]Although wealth is more inclusive than land, land was the dominant form of wealth in the countryside. Moreover, many tax registers, on which this is based, would have had difficulties observing wealth other than land. I also note that in Eastern Europe, demesnes (farms that were managed by lords) that were owned by lords remained a large proportion of the economy, limiting peasant holdings (Cerman, 2012).

Table 1: Wealth Inequality in Pre-industrial Countries

Country	Year	Type	Unit	Gini	Prop. Landless %
England	1688	Wealth	All Households	0.94	84.8
England	1803	Wealth	All Households	0.93	86.5
Sweden	1750	Wealth	Rural Households	0.72	20
Denmark	1789	Wealth	Rural Households	0.87	59
Finland*	1800	Wealth	Rural Taxed Males	0.87	71
Northern Spain+	1749-59	Land	All Households	0.78	
NW. Italy*+	1700-99	Wealth	Rural Taxed Households	0.77	
Central Italy*+	1700-99	Wealth	Rural Taxed Households	0.75	
Philippines	1903	Land	Rural Households		19
China+	Qing	Land	Rural Households	0.6-0.71	13-26
China	1930s	Land	Rural Households		33
Japan	1700-1868	Land	Rural Households	0.53	13

** indicates cases where inequality is underestimated. + indicates small samples of villages. Taxed households refer to estimates based on wealth taxation, for which those without wealth are not included. For England, I estimate Gini from numbers in Lindert (1987) assuming equality within wealth group, making this an underestimate. For Sweden, the estimates only include rural residents. If urban owners are included, the Gini Coefficient becomes 0.77. Northern Spain estimates are from Palencia, Northwest Italy estimates are from Piedmont, and Central Italy estimates are from Tuscany.*
Sources: Lindert (1987), Bengtsson et al. (2018), Soltow (1979), Soltow (1981), Nicolini and Ramos Palencia (2016), Alfani (2015), Alfani and Ammannati (2017), Sanger (1905), Brandt and Sands (1990), Chao (1986)

distinguished these regions? I turn to answering these questions by doing a more detailed examination of East Asian evidence than in the past literature.

Data

I use three data sources. First, I use population censuses (*Shumon Ninbetsu Aratame Cho*), 1634-1872, to track inequality in early modern Japan. Second, I use data on the share of land under tenancy in Japan, 1879-1945, to track inequality in modern Japan. Third, I use wealth data from Italy, 1307-1809, for comparison.

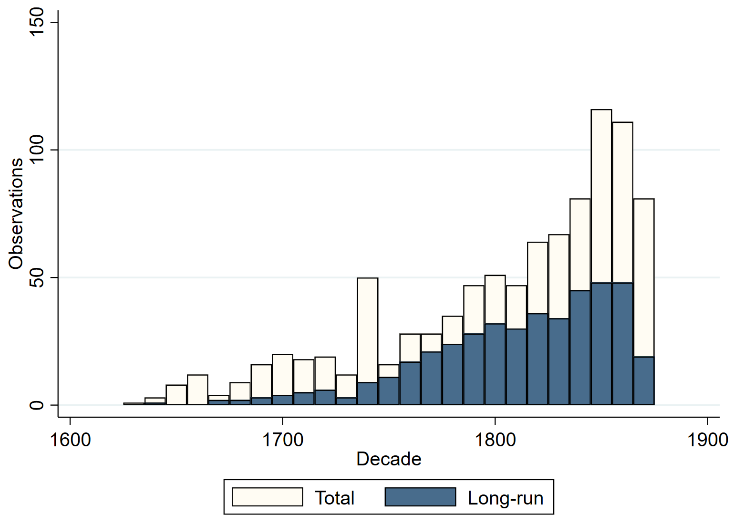


Figure 3: Total Observations by Decade

Population Censuses

The population censuses were annually compiled by all villages by order of the lords 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.[9]

I have collected population censuses from three sources. The first is data published in local histories which I have digitized.[10] The second is the large dataset collected by the Reitaku University "Population and Family History Project". Third, I use an online dataset collected by Hiroshi Kawaguchi called DANJURO. I drop all observations from post stations, where transportation and other services for travellers were located, and coastal villages where fishermen resided. This is because other important forms of wealth, in the form of shops or boats, are unrecorded making landholding inequality unrepresentative of wealth inequality. Overall, I have 944 village-year observations from 591 villages.[11] There are unsurprisingly less observations for earlier years, due to survival bias with a dip in the 1870s when the

[9]Matsuura (2009) finds shogunate lands more often had landholdings data. Also, documents titled *shumon-ninbetsu aratame cho* were more likely to include this information.

[10]This data includes other village level administrative sources such as the "goningumi mochidaka cho"that include household landholdings.

[11]I originally had 2,455 village-year observations but I dropped multiple observations within decades as I am not interested in short-run fluctuations.

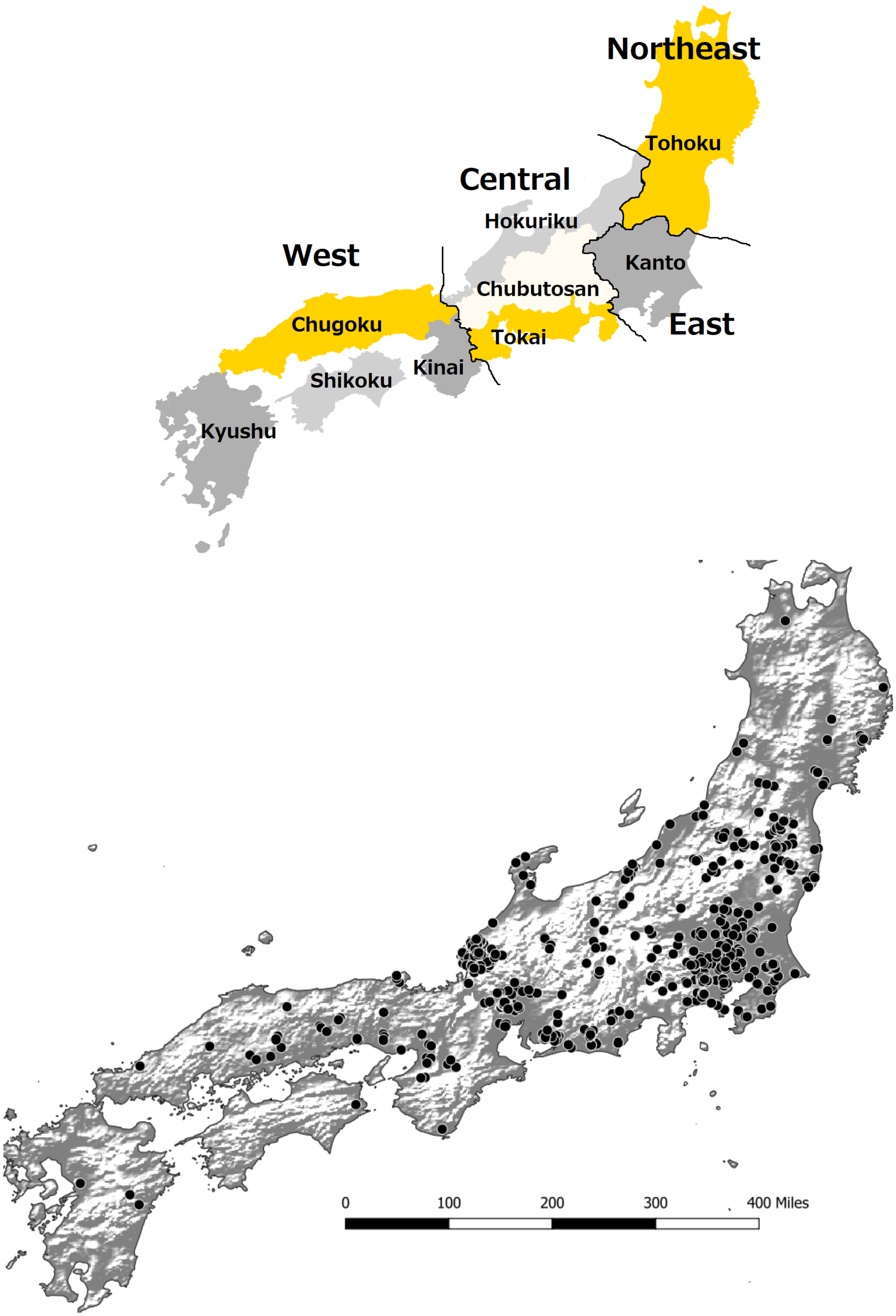


Figure 4: Maps of Japan
Top: Regions defined in data
Bottom: Locations of the 591 Villages (White shade indicates high elevation)

censuses ended (see figure 3). I also observe villages over the long-run, defined as multiple observations spanning more than 25 years, for 77 of these villages with which I investigate time trends. Unfortunately, the data is highly sporadic so that villages can reappear in my sample after being missed 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 4). The topographic map 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 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.

For analytical purposes, I have grouped provinces into region as defined by figure 4.[12] The traditional regional divides are unsuitable for this purpose, so I have created these regions based on cohesion. In some cases, mountains naturally split up lands into economically cohesive units. The most notable is the Kinai region dominated by the Osaka plains, and the Kanto region dominated by the Kanto plains. 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.

The landholdings 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 grain) or mon (bronze coins) for lands within the village.[13] These "official yields" were simply copied from past cadastral surveys and were never updated to account for increased plot size or increased productivity.[14] The official yields were standardized to rice yields, whereby yields from other crops were converted in value to rice crop equivalents. As tax rates could vary greatly by village, official yields are a poor measure of land values across villages so I confine

[12]There are a few notable tweaks. Chugoku refers to the combination of the *Sanin* and *Sanyo*. 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.

[13]The date of the survey for each village is unknown. For a very small number of villages landholdings are measured in area. Dropping them does not affect the findings.

[14]Peasants undoubtedly knew the yield of their lands, as can be witnessed in a vibrant land market that involved peasants valuing land based on yield among other things. However, they did not declare it in official documents for fear of higher taxation.

my measurement of inequality to within the village (Kodama, 1979).

Ideally, I would want landholdings to be in the value of land net of tax. The difference between these measures can be captured in equation 1.

$$value_{i,t} = yield_{i,0} \times \Delta Prod_{i,t}(land\ rental\ rate_{i,t} - tax_{v,t}) \quad (1)$$

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. The land rental rate is the implicit or explicit share of yield being awarded to the landholder in return for his rights. Finally, the second component of the right hand side captures the tax. Taxes were based on the outdated land yield and varied by village. This makes official yields across villages incomparable. As I am computing inequality measures that rely on wealth relative to total wealth, such as the Gini coefficients, there is no problem if relative value is a function of the official yields multiplied by a constant or

$$\frac{value_{i,t}}{total\ value} = \frac{yield_{i,0} \times \Delta Prod_{i,t}(land\ rental\ rate_{i,t} - tax_{v,t})}{\sum_{i=1}^{N} yield_{i,0} \times \Delta Prod_{i,t}(land\ rental\ rate_{i,t} - tax_{v,t})} = \gamma \times yield_{i,0}$$

where γ is a constant within village. This would hold if changes in productivity, land rental rates, and taxes were uniform within the village. However, this assumption leads to measurement error and I address each of these issues.

First, land rental rates were not uniform across all plots. The share of land rents going to the landholder depended on the crop. A survey in 1880 shows that wheat plots had land rents of 40% compared to 54% on rice plots (Nourinshou-Noumu-kyoku, 1926). Wheat yields were converted to rice yield equivalent but the share of this yield going to the landholder is miss-measured. I do not observe crop types so I cannot directly control for this. However, if land markets were well functioning, there is little reason to believe land rich households would accumulate plots for a specific crop type. Surplus lands were rented out in the vast majority of cases so there was no economies of scales in specializing in particular crops.

Second, the change in productivity may not have been uniform across plots. There will be no issues if this measurement errors was uncorrelated with yields but there are two potential issues. First, land rich households may have seen faster technological growth. However, when true land values have been comparable to the outdated official yield, 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. A second problem is if measurement errors are big enough to make inequality measures unreliable as hypothesized by some historians.[15] I can find the extent of this problem by looking at private records of large landholders in the 19th century primarily from the *Kinai*. The *Kinai* region had highly commercialized agriculture and also saw the most technological advance during the period. The large landholders recorded both the official yields and the true yields to value their lands for potential sales or rentals.[16] I test for the strength of official yields in predicting actual yields by taking logarithms of equation 1 to get

$$ln(true\ value_i) = ln(\Delta Prod_{i,t}) + ln(land\ rental\ rate_{i,t} - tax_{v,t}) + \beta ln(official\ yield_i)$$

Assuming productivity, land rental rates, and taxation are constant within village I get specification 2.

$$ln(true\ value_i) = \alpha_{owner} + \beta ln(official\ yield_i) + \epsilon_i \quad (2)$$

I use landowner dummies to partially control for differences in tax rates across villages. The error terms absorbs any measurement error due to assuming official yields reflected true yields. One issue with this specification is that this landowner owned land spanning multiple villages so the owner dummy does not fully control for differences in tax rates across villages and I lack the data to control for plot location. Therefore, this can be considered an over estimate of measurement error. The parameter of interest is the significance of β and the R^2 which measures how well official yields explain true land values.

Alternatively, I can estimate a specification with the true yield as the dependent variable for a larger sample. This would get at the issue of measurement error if land rental rates and taxes were similar within village so that changes in productivity is the big issue. This can be considered as an underestimation of measurement error. The specification is as follows.[17]

$$ln(true\ yield_i) = \alpha + \beta ln(official\ yield_i) + \epsilon_i \quad (3)$$

I get rid of the owner fixed effect which primarily controlled for differing tax rates across villages and assume changes in productivity were uniform within the *Kina* region. However, I also include the results when I do include owner fixed effects.

The regression shows the official yield is always highly statistically significant at the 1% level. The R^2 is 0.37 when using true values as the dependent variable but this is a lower bound as explained earlier. On the other hand, taking true yields as the dependent variable,

[15] Kinoshita (2017) presents evidence from a petition from peasants to lords asking for tax forgiveness. In this petition, peasants list their "true" incomes which is not correlated with landholdings but the source is obviously biased.

[16] I use data from (Takeyasu, 1966), (Shoji, 1986)

[17] This will have $true\ yield_{i,t} = yield_{i,0} \times \Delta Prod_{i,t}$

	(1) log(true value)	(2) log(true yield)	(3) log(true yield)
log(official yield)	0.317***	0.819***	0.813***
	(0.120)	(0.0446)	(0.0325)
Owner FE	Yes	No	Yes
N	89	153	153
adj. R^2	0.366	0.779	0.862

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Testing for Measurement Error

I get an R^2 of 0.78 (or 0.86 if I include fixed effects) indicating official yields remained highly relevant.[18] The true explanatory power is likely closer an R^2 of 0.8 within the Kinai region because the default distribution of tax within village is likely to have simply multiplied tax rates to official plot yields.[19] Further, these values are from a technologically advanced region which saw large changes in technology so the values must be considered lower bound estimates for the country as a whole. Official yields remained good indicators of value.

A final issue is that landholdings only accounted for land within the village. I can check the degree of the problem by looking at the proportion of land held by outsiders in 47 villages for which outsider landholdings were also listed. The average was 15%, a small proportion of land. Those who held land outside the village were usually the richest peasants so I underestimate wealth at the top of the distribution. This causes a modest downward bias in my Gini coefficient estimates.

For documenting inequality, the main strength of this data is in its accounting for landless households. Most pre-industrial studies of wealth inequality rely on tax registers which commonly ignore those without assets (Alfani, 2015; Alfani and Ammannati, 2017). Other studies use probates but such samples are always biased and require re-weighting through an assumption of population shares by wealth (Bengtsson et al., 2018). This has been a serious shortcoming for European studies where the landless made up a large share of the population.

The summary statistics in table 3 shows that inequality appears to be low but with much regional variation. Only 13% of households were landless but the bottom 40% held very little land themselves. The middle 40% held 33% of wealth while the top 20% held

[18]Moreover, I also find a Malthusian relationship holds within the registers, whereby birth rates are positively correlated with landholdings.

[19]The distribution of tax within village is not visible, as as a whole had to pay the tax rather than any individual.

Table 3: Summary Statistics

Region	Gini	Prop. Landless	Prop. Wealth top 20%	Prop. Wealth Bottom 40%	Villages
Kyushu	0.44	0.06	0.51	0.10	3
Shikoku	0.35	0	0.51	0.15	1
Chugoku	0.53	0.11	0.59	0.07	27
Kinki	0.63	0.26	0.68	0.04	14
Tokai	0.49	0.08	0.54	0.10	44
Chubutosan	0.61	0.21	0.64	0.05	60
Hokuriku	0.64	0.36	0.70	0.03	152
Kanto	0.49	0.06	0.56	0.10	197
Tohoku	0.44	0.12	0.51	0.12	93
All Regions	0.51	0.13	0.58	0.09	591

I take one observation per village that is closest to 1800. For all regions I take the weighted average by population.

Table 4: Correlation Coefficients

	Gini	Prop. Landless	Prop. Wealth top 20%	Prop. Wealth Bottom 40%
Gini	1.00			
Prop. Landless	0.71	1.00		
Prop. Wealth Top 20%	0.96	0.70	1.00	
Prop. Wealth Bottom 40%	0.92	0.60	0.95	1.00

58% of wealth. The Gini is only 0.51 which is very low. Although this may seem like high inequality, wealth inequality is always much higher than income inequality because wages are far more equally distributed, especially in a pre-industrial economy with unskilled laborers. Thus, these numbers translate into Gini coefficients of income as low as 0.26, a remarkably egalitarian economy.[20] These initial results suggest equality and I will show this holds when I account for various issues such as sampling bias or time trends. As all inequality measures are highly correlated (see table 6), I focus on Gini coefficients to avoid repetition.

[20] Given wages could sustain 3 people for a man at around 1800, I take the landholding equivalent of the wage to have been 4.4 *koku* of land, where 1 koku is about 3 quarters of the rice needed to survive a year. After distributing this equally among all households, I calculate the Gini coefficient. This is not entirely accurate for all villages, but suffices as an approximation.

Other Data Sources

I use prefectural level data on the share of land under tenancy in modern Japan, 1879-1945, for two purposes. First, I use it to track the trends in inequality after the collapse of feudal Japan under the Tokugawa shogunate. These were originally recorded in prefectural statistic books and later compiled by Arimoto et al. (1984). The administrative units changed after the Meiji revoultion of 1868, so the prefectures are not comparable to the earlier provinces. The share of land under tenancy records the area of plots farmed by tenants divided by the total area. This is a very good measure of inequality because it captures the surplus (or deficit) of landholdings among households.

This measure is no longer at the village level as for my earlier measure so it also captures increased inequality due to land ownership by people outside the village making it directly incomparable.[21] However, cross-village holdings are thought to have stayed stable during the feudal period due to frictions in the land market across villages (Nakabayashi, 2013). Therefore within village inequality captured most aspects of inequality. This changed following the end of feudalism and it is a strength of this measure to be able to capture the inequality as a result of increased cross-village holdings.

Second, I use the data to backwardly project inequality levels in regions where I lack observations. I use the earliest years available for the projection because I expect higher correlation with temporal proximity. As a robustness check, I also use province level data from 1883-84 (Noshoumushou, 1959).[22]

For comparative purposes, I also use Italian data, (1307-1809) made available in Alfani (2015) and Alfani and Ammannati (2017). These are inequality measures from rural Italy calculated at the village level by using records on what effectively became a real estate tax. The data can be broadly considered real estate inequality excluding the landless and I refer to the original articles for further details on the data. As the landless were a key feature of Western Europe, the inequality measure has a large downward bias. For the rare cases in which the landless are observed, Gini coefficients jump from 0.523 to 0.704 in Poggibonsi and 0.491 to 0.687 in Santa Maria Impruneta in 1458. Despite differences with my measure, the data are highly comparable to my data when just looking for a positive/negative trend.

[21] In theory, a within village measure could register no change in inequality while an aggregate measure does due to increasing shares of land ownership from people outside the village. Such a scenario seems extreme and unlikely.

[22] This data is incomplete so I patch up the missing data using other data on total yields. I first use table 1 of Noshoumushou (1959) assuming the same paddy dry ratio to calculate total land within province for those that are missing. I then assume the provinces have the same share of land under tenancy as the prefecture in which they belong.

Methodology and Results

Time Trends

Using long-run data on inequality across 77 Japanese villages (1647-1872), 45 Japanese prefectures (1879-1945), and 18 Italian villages (1307-1809), I compare trends in inequality across time.[23] I begin by showing the trends in inequality by region for Japan (figure 5a) and Italy (figure 5b). A positive trend in both Japan 1879-1945 and pre-industrial Italy is immediately apparent, compared to a lack of any obvious trend in early modern Japan. I can formally test for a trend with a simple fixed effect specification 4.

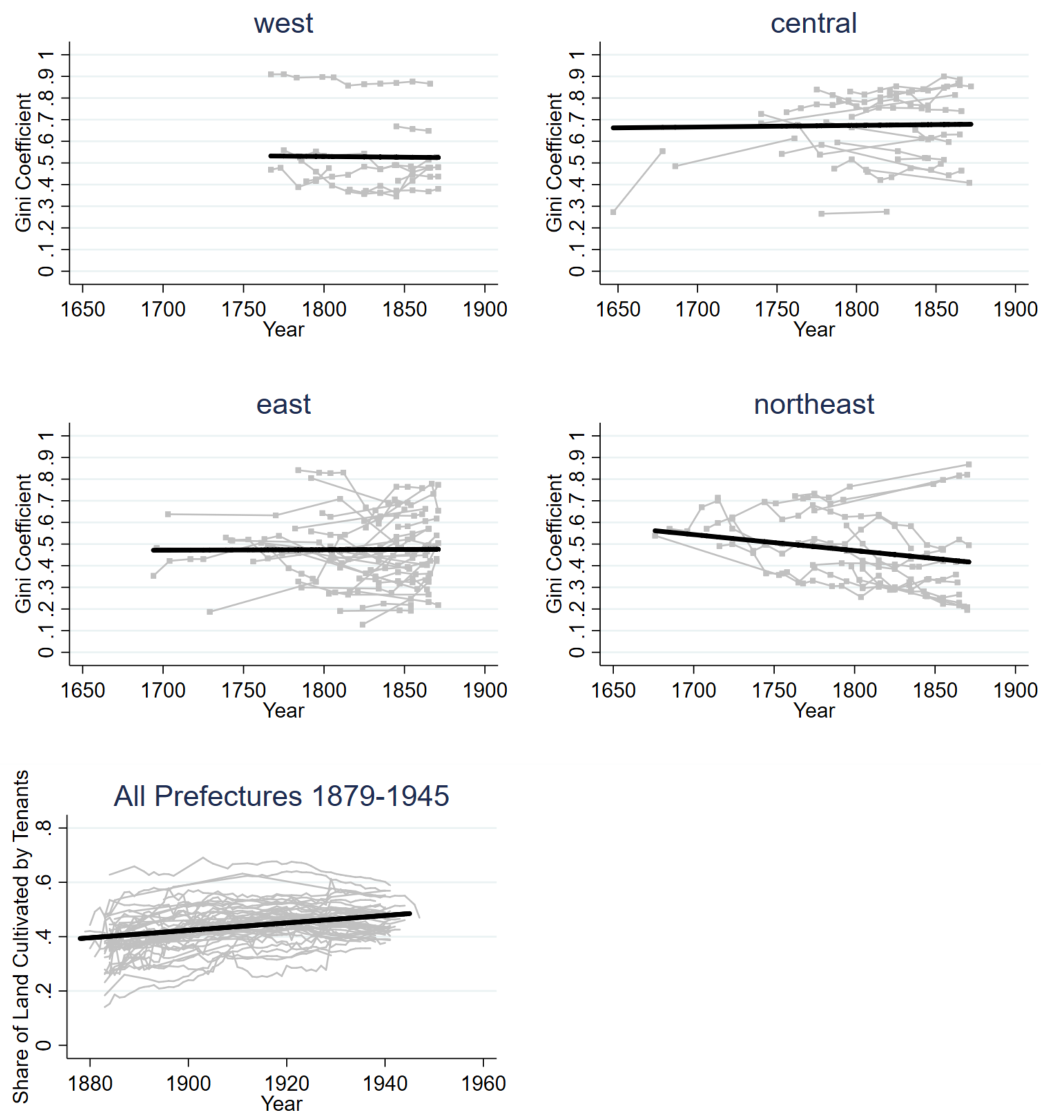
$$ineq_{v,t} = \alpha_v + \beta year_t + \gamma X_{v,t} + \epsilon_{v,t} \quad (4)$$

If there is a time trend, I would expect β to be significant. I include large events as controls in the form of the black death and the second world war that can affect inequality. I do not include the major famines in early modern Japan mainly because the degree of the shocks were small. Moreover, they had differential effects by region which are not well measured. In any case, I will later show that they had little impact on inequality.

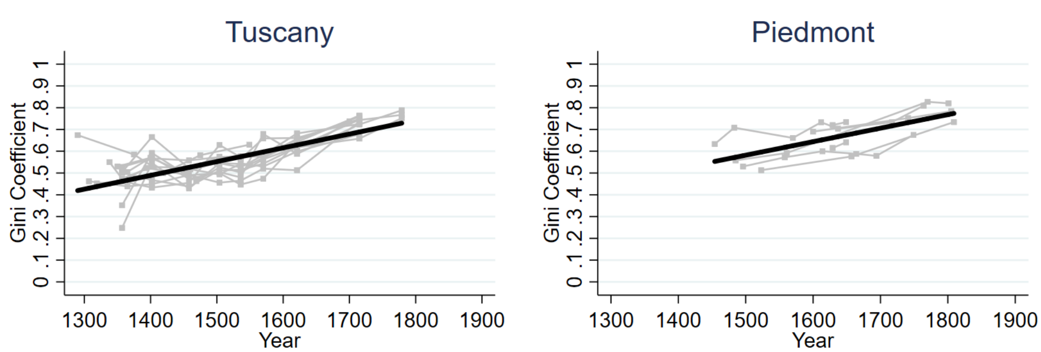
The results show early modern Japan had persistent equality in contrast to Italy with gradually rising inequality. I find a large positive trend in the case of Italy, with Gini coefficients increasing by 0.07 per century (table 5) and most likely a higher pace if the landless could be included. In contrast, early modern Japan had a highly persistent equality. This is not due to regional compositions within my data. If I split my data by region, I get similar results although the power is weaker. In contrast, inequality was on an upward trend after the Meiji revolution of 1868 which mirrors findings by others (Ono and Watanabe, 1976; Otsuki and Takamatsu, 2008; Moriguchi and Saez, 2008).

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, 1879-1945, the war years also saw a decrease in inequality. Both these results suggest large shocks can be great levellers as argued by Scheidel (2017). 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

[23]For the case of pre-industrial Japan, I could also look at trends in inequality across time by region. However, the variation in inequality within region is rather high meaning any trend could reflect changes in sampling. Thus, this method is inferior and will only work with sufficient observations within each region-time.



(a) Japan



(b) Italy

Figure 5: Pre-industrial Inequality Dynamics by Country-Region

Table 5: Test for Trend

Japan 1694-1872	(1) All Regions	(2) Tohoku	(3) Kanto	(4) Central	(5) Kinai	(6) Chugoku
century	-0.0282	-0.0740*	0.00231	0.00743	-0.00246	-0.0100
	(0.0217)	(0.0379)	(0.0307)	(0.0298)	(0.0598)	(0.0467)
N	428	129	152	83	20	44
adj. R^2	0.025	0.176	-0.007	-0.010	-0.054	-0.021
Japan 1879-1945	(7) All Regions	(8) Tohoku	(9) Kanto	(10) Central	(11) Kinai	(12) Chugoku
century	0.142***	0.378***	0.209***	0.0649***	0.0963***	0.0322**
	(0.0220)	(0.0344)	(0.0456)	(0.0243)	(0.0328)	(0.0140)
Post-1940	-0.0219**	-0.0239	-0.00292	-0.0304***	-0.0434***	-0.0306***
	(0.00972)	(0.0211)	(0.0127)	(0.0111)	(0.00946)	(0.00523)
N	2067	286	359	497	205	213
adj. R^2	0.120	0.440	0.413	0.071	0.062	0.001
Italy 1307-1809	(13) All Regions	(14) Tuscany	(15) Piedmont			
century	0.0676***	0.0687***	0.0621***			
	(0.00498)	(0.00556)	(0.0126)			
preblack	0.108***	0.110***				
	(0.0310)	(0.0319)				
N	126	99	27			
adj. R^2	0.671	0.654	0.790			

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The dependent variable is Gini coefficient except for Japan 1879-1945 for which I take the share of land under tenancy. Standard errors are clustered by village.

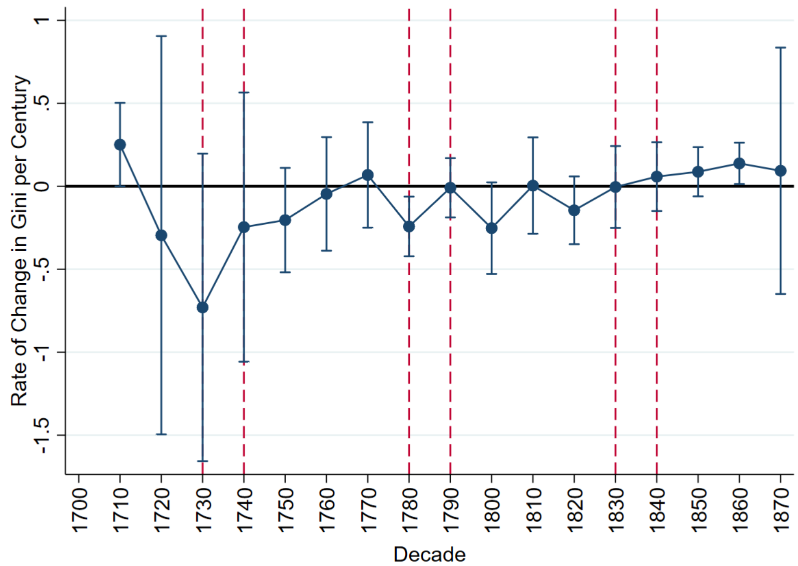


Figure 6: The Rate of Change in Gini in Japanese Villages
95% confidence intervals plotted. Decades affected by famine enclosed in dashed lines. Standard errors calculated with Bonferroni correction.

changing over time by estimating equation 5.

$$\frac{Gini_{v,t} - Gini_{v,t-k}}{k} = \beta decade + \epsilon_{v,t} \tag{5}$$

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.

The results show no obvious pattern with the slope meandering around zero change (figure 6).[24] Notably, the great famines appear to have had no clear impact on inequality dynamics.[25] Early modern Japan was clearly different from later periods or contemporaneous Italy, due to a persistent equality. Having established this lack of trend, I will now use a larger set of data to estimate the level at which inequality persisted in early modern Japan.

[24]Unfortunately, the power is low before 1750 with less than 10 observations.
[25]An analogous exercise with Italian data reveals trends to have always been positive.

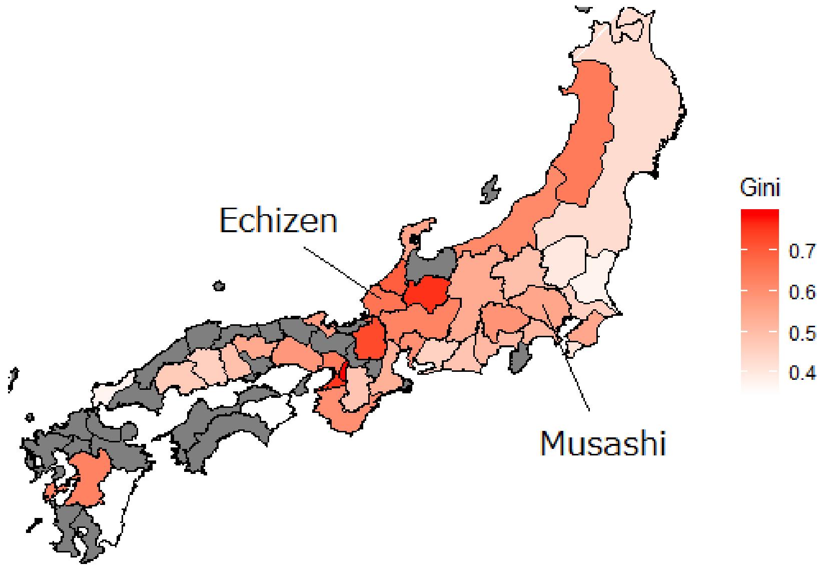


Figure 7: Average Inequality by Province

The Geography of Inequality

This section has two objectives. First, I show how inequality in Japan varied across space. Second, I create a nationally representative estimate of inequality levels through weighting and backward projection. I show that such adjustments do not change the idea of a highly equal Japan.

Basic mapping of the data by provincial level average inequality already shows much heterogeneity (figure 7).[26] A belt of unequal provinces dot the coast facing the sea of Japan (also known as the East sea) down to Osaka. At the opposite extreme, the most equal provinces are in the east and northeast facing the pacific. However, it is also clear that observations are lacking for much of Western Japan. The heterogeneity of inequality by regions means the inequality of Japan as a whole is far from certain.

Furthermore, this map also masks some heterogeneity within region. Figure 8 takes two provinces with a large number of observations and plots the kernel density of Gini coefficients. The standard deviation for Echizen province was 0.15 while that for Musashi province was 0.14 so a map colored at the province level masks micro-level variations. Moreover, large sample sizes are needed to accurately estimate the mean of inequality.

To resolve these issues, I estimate inequality using Kriging which relies on spatial correlation to estimate inequality where it is not observed at the grid level.[27] The idea is similar

[26] I take one observation per village and average this by province.
[27] For introductory details of this method see Bivand et al. (2008)

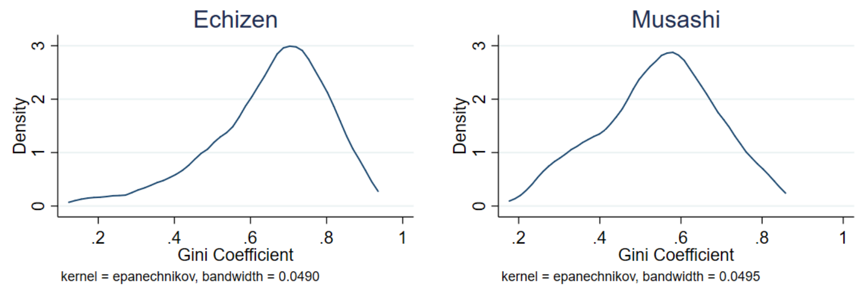


Figure 8: The Kernel density of Gini coefficients within Province

to time series where there is serial correlation across time, except time can be conceptualized as space. The mean is assumed to be the same everywhere but there can be regional clusters of high or low inequality due to spatial correlation. This can be represented by equation 6

$$y(s) = \mu + e(s) \tag{6}$$

$e(s)$ is correlated with areas nearby so the prediction is that inequality is interpolated to be high if there is an observation with high inequality nearby.

The degree of this correlation is estimated by looking at spatial correlation which can be measured using Moran's I statistic.[28] This statistic essentially measures the correlation coefficient of observations across space with a positive (negative) indicating positive (negative) spatial correlation. Thu null is zero spatial correlation, so that the error term $e(s)$ is totally random. This means geographic proximity would have zero predictive power for inequality so that kriging would be an invalid approach.

Figure 9 plots a non-parametric estimate of Moran's I statistic across distance.[29] It shows the postive spatial correlation exists up to approximately 100 miles. Thus, I can use nearby observations of up to 100 miles to interpolate for areas where I lack observations.

The resulting predictions show that province level maps were generally accurate in their depiction of inequality (figure 10). First, the region neighboring the sea of Japan in the north down to Osaka was the area with highest inequality. Second, a large pocket of equality can be seen in the Kanto region and the neighboring region in modern day Fukushima. A smaller pocket of equality can also be seen in the southern central region. Third, the limitation of this methodology can be seen in the graph plotting standard errors, due to the lack of

[28]The equation is

$$I = \frac{N}{W} \frac{\sum_i \sum_j w_{i,j}(x_i - \bar{x})(x_j - \bar{x})}{\sum_i (x_i - \bar{x})^2}$$

N is the number of spatial units, x_i is the value of an attribute, $w_{i,j}$ is a weight measuring distance and W is the sum of the weights.

[29]I use the spline.correlog command in the ncf package on R.

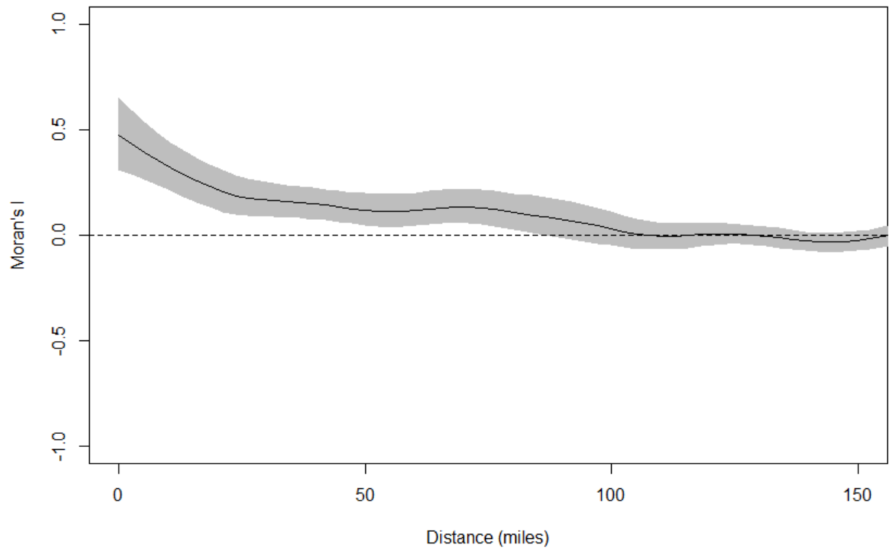


Figure 9: Spatial Correlation of Inequality (95% CI in grey)

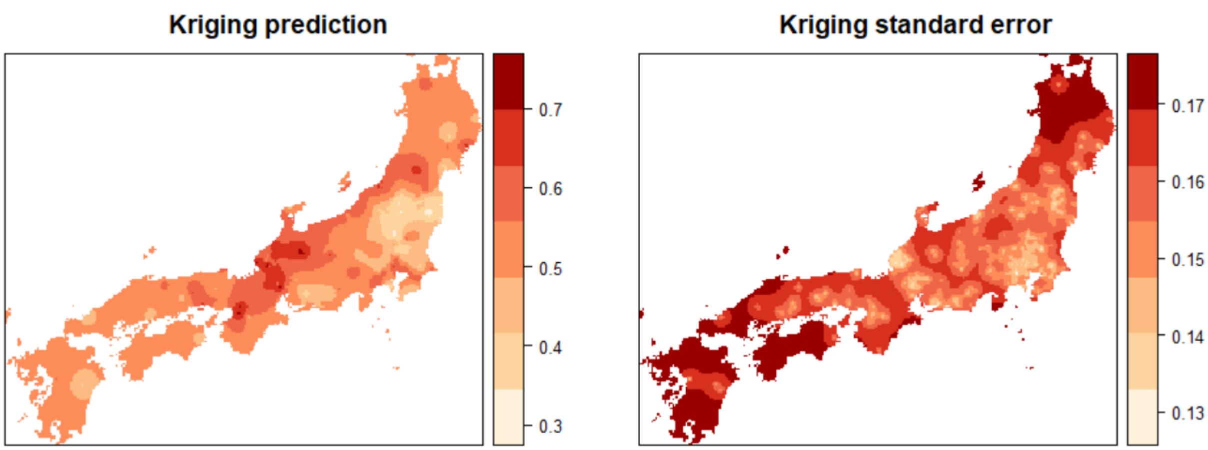


Figure 10: Spatial Interpolation by Kriging

strength in spatial correlation. Regions with few observations, in the north and south west, have very high prediction errors. Yet, these results are valuable because they present the most conservative estimates of the geography of inequality, given a village level data-set.

Estimating National Level Inequality

Next I will be estimating inequality for Japan as a whole at the prefecture level, using a backward projection of inequality for areas with few observations. The key assumption is that inequality had a strong persistence over time such that inequality in the 1880s are predictive of inequality in early modern Japan. A simple OLS regression of available average prefectural level inequality during the two periods show this assumption holds for most

Table 6: Correlation of Inequality: Early Modern to Modern

	(1) Gini Coefficient	(2) Proportion Landless	(3) Share of Wealth Bottom 40%	(4) Share of Wealth Top 20%
Share of Land under Tenancy	0.524*** (0.177)	-0.0208 (0.177)	-0.236*** (0.0786)	0.488*** (0.148)
N	33	33	33	33
adj. R^2	0.139	-0.032	0.129	0.174

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

measures (table 6).[30] All coefficients are highly statistically significant excluding proportion landless. This does not come as a complete surprise because proportion landless is bounded at zero, and many villages had almost no landless households.

I use this correlation to predict early modern inequality for prefectures with few or no observations. I use the average inequality within villages if there are more than 3 observations because I want to avoid generalizing with outlier villages. This means 20 prefectures are imputed while the others are based on observations. Using these prefectural level estimates of inequality, I estimate regional and national inequality by weighting the observations by prefectural population levels taken from Ohkawa et al. (1983).[31]

Backwardly projecting inequality using this correlation results in table 7. There is a small increase in estimated inequality compared to the summary statistics but inequality remains low. At the regional level, inequality appears much higher in Kyushu and Shikoku where there were few observations and backward projection predicted a far higher level of inequality.

This method of estimating inequality also yields a prefectural level estimate of inequality mapped in figure 11. This also confirms the regional trends already outlined earlier. These results remain highly stable when I use alternative estimates (see appendix). One interesting finding is that heterogeneity mattered for inequality as the counterbalancing of unequal with equal regions kept Japan as a whole equal.

Finally, I also plot the regional dynamics of rural inequality in the post-Tokugawa era in figure 12. The gradual spread of inequality across Japan is clear, as tenancy became more widespread and the heterogeneity by region disappeared.

[30] I could also include region dummies in the regression but they turn out to be insignificant.

[31] I use population in 1879 and subtract city population from 1875 for the 5 largest cities: Tokyo, Kanazawa, Nagoya, Kyoto, and Tokyo.

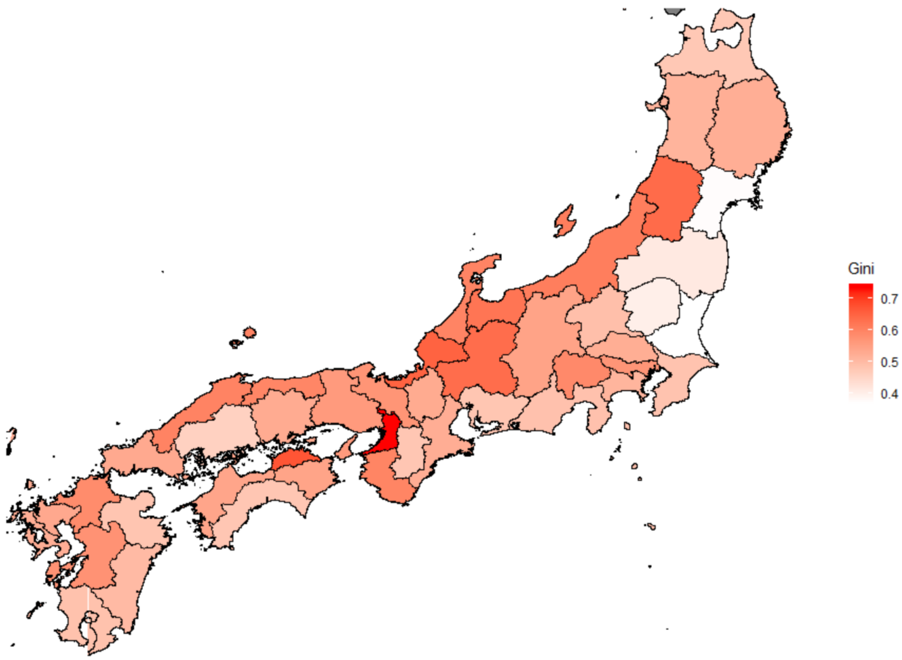


Figure 11: Estimated Gini-coefficient by Prefecture in Early Modern Japan

Table 7: Estimated Inequality by Region

Region	Gini	Prop. Wealth top 20%	Prop. Wealth Bottom 40%	Villages
Kyushu	0.53	0.59	0.08	3
Shikoku	0.56	0.62	0.07	1
Chugoku	0.53	0.59	0.07	27
Kinki	0.61	0.67	0.04	14
Tokai	0.50	0.54	0.08	44
Chubutosan	0.57	0.62	0.06	60
Hokuriku	0.62	0.68	0.04	152
Kanto	0.47	0.54	0.11	197
Tohoku	0.49	0.55	0.10	93
All Regions	0.53	0.59	0.08	591

I take one observation per village that is closest to 1800. For all regions I take the weighted average by population. I backward project for all prefectures with no observations and for prefectures with less than 3 village observations.

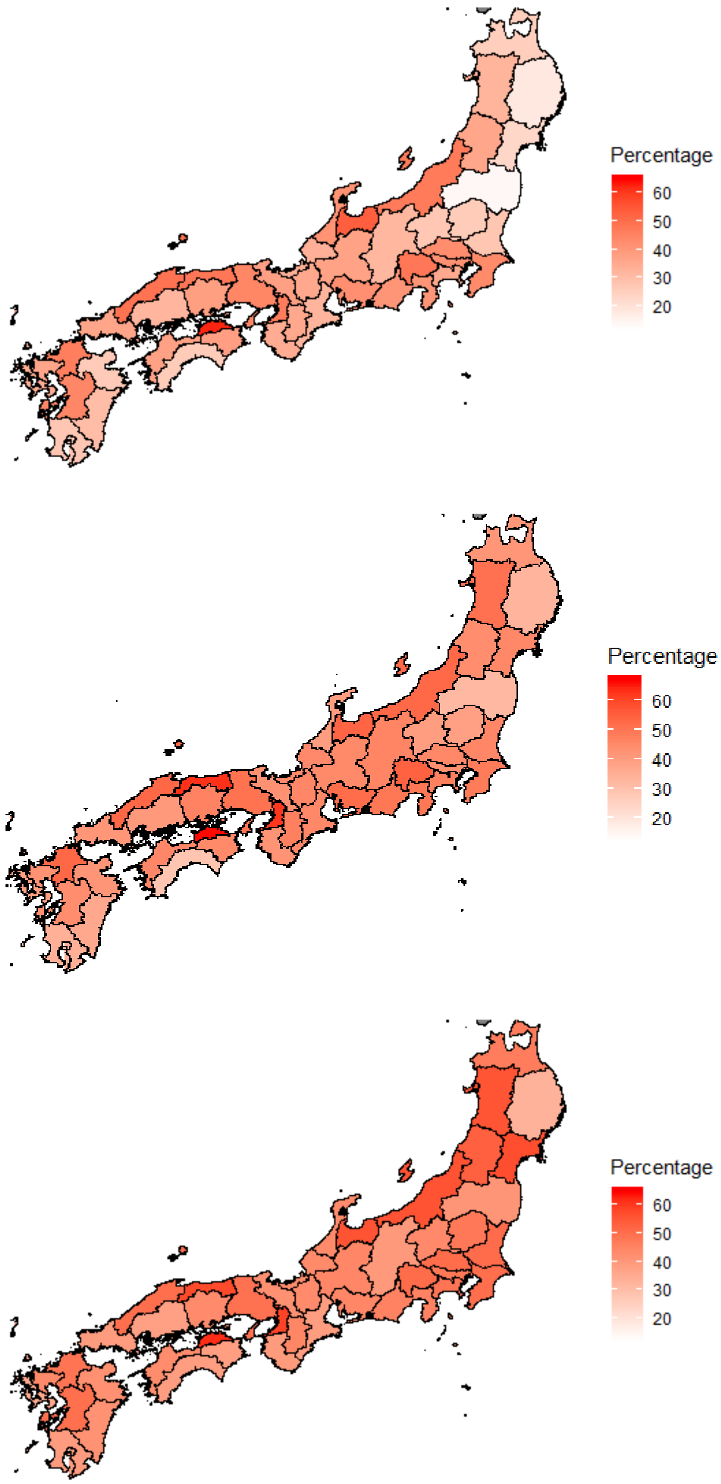


Figure 12: Share of Land Farmed by Tenants: Post-Tokugawa Period 1880 (Top) 1910 (Middle) 1935 (Bottom)

Inequality Over the Very Long Run

Up to this point, I have primarily focused on Italy and Japan both of which have comparable measures of wealth inequality. Should these findings be interpreted as a peculiarities specific to the period and place or could they provide insights into trends in Western Europe or East Asia? The choice of these regional grouping makes sense because they shared many cultural institutions with respect to demography or governance that could have affected trends. To look at this, I use the available fragmentary evidence for the cases of England, Germany, Italy, Sweden, Japan and China.

Western Europe

The upward trend in wealth inequality in the countryside, with the exception of large shocks, has been well documented for the period following the black death in Western Europe.[32] In the case of Germany 1300-1850, (Alfani et al., 2017) uses tax registers to show rural inequality was consistently trending upward with the exception of the thirty years' war (1618-48).[33] Much like in Italy, Gini coefficients in rural areas that exclude property-less was increasing at approximately 0.07 points per century.[34] If the property-less were included, the rate of increase would be most certainly higher. For the case of Sweden, Bengtsson et al. (2018) uses probate records to show inequality increased from 0.72 to 0.83 from 1750-1850 which preceded the industrial revolution.[35] Moreover, inequality was generally high in Western Europe by the industrial revolution showing wealth inequality converged towards a high level everywhere.

However, it is less well known whether Western Europe already had high levels of inequality prior to the black death. A lot is at stake as it implies Western Europe's tendency towards high inequality is not unique to the early modern period. Could high inequality have been persistent? In the earlier case of Tuscany in Italy, the pre-black death wealth inequality Gini was higher by 0.11. This indicates higher inequality preceded the black death. However, it is a poor measure of magnitude as it excludes property-less households. The black death was a shock that likely vastly decreased the property-less class due to increasing wages and lower property prices. Thus, the actual drop in wealth inequality is likely to have

[32]There is a larger literature on inequality within cities with similar findings in the case of Europe. See Scheidel (2017) chapter 3.

[33]In the case of cities, they show a decline in inequality due to the black death.

[34]I did not include these findings in my earlier estimates as the data is not yet available.

[35]A potential case for which the trend may not fit is Portugal. Reis (2017) finds income inequality, which is usually a good approximation of wealth inequality, was decreasing in a mix of rural and urban areas. However, the evidence from rural regions is weak. Moreover, wealth inequality may have remained constant or increased because decreased income inequality was partially driven by decreasing land-rent wage ratios.

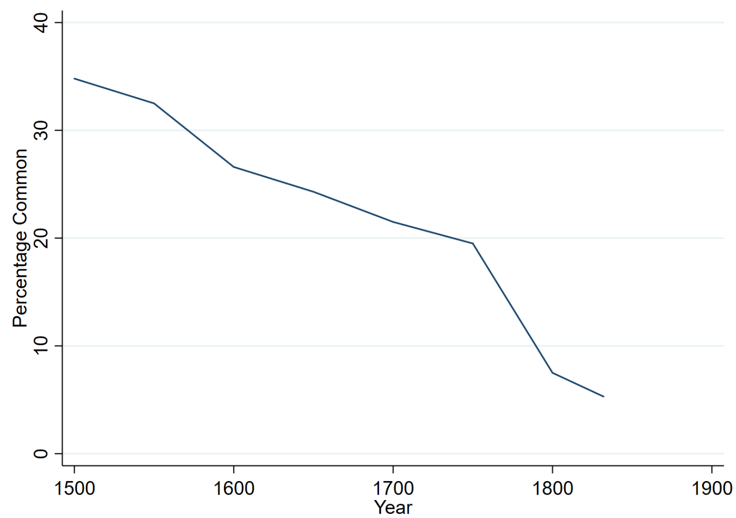


Figure 13: Percentage of Land Under Common Rights
Source: Clark and Clark (2001)

been far more dramatic.

Another case where similar dynamics can be estimated is England, 1288-1800, the first economy to industrialize in Europe. Estimating wealth inequality in England has remained controversial due to the existence of "common rights" that accrued land rent.[36] For instance, a copyholder (or tenant) had inheritable and legally enforceable use rights over land and subtenancy was highly profitable as rents to the landowner were fixed and decreased over time.[37] Such intermingling of rights were concentrated in commons, which included open-fields, wastes, meadows, and pastures. On the opposite end, enclosed lands or demesnes had full ownership rights for the landowner. Overall, looking at land ownership alone can be a poor measure of land distribution. Fortunately, ownership within the commons can be observed in both the 13th and the 18th century, in addition to trends in the post-black death period.

In the case of England in the 13th century, it is possible to estimate wealth inequality using data from the hundred rolls, 1279-80. The hundred rolls, also known as the second domesday book, was a survey of landholdings across the country that was never completed. The data from Cambridgeshire, Huntingdonshire, Oxfordshire and Warwickshire (in the mid-

[36]More formally, common rights were "old-established rights exercised by the occupiers of farm lands and cottages, and varied considerably in nature and extent from place to place" (Mingay, 2014)

[37]Gayton (2013) shows that copyholders could sublet at 75.8 pence per acre per annum net of rents to the owner. This amounts to wheat flour that could feed about 3.5 people for a year on 2000 kcals per day if the copyholder had 30 acres. However, there has been no systematic exploration of the extent of copyholding in England to show how copyholdings were distributed so other approaches must be taken for now.

lands and the East of England) were collected by Kanzaka (2002) and peasant landholding rights are well measured. However, the landless were never recorded causing problems of measurement. Ignoring the landless, the Gini coefficient for landholdings was approximately 0.6 (see appendix for details of calculation).[38] If we assume the landless made up 47% of the rural population, as estimated by Campbell (2008) for the whole of England and Wales, the Gini coefficient increases to 0.8.[39] Moreover, even considering that 47% of rural households were landless implies high levels of wealth inequality preceded the black death.

The black death resulted in the permanent decline of serfs by the 1450s as many easily escaped out of such relationships during times of great labor scarcity (Whittle, 2000). Peasants also gained stronger rights over land through bargaining, and wealth inequality seems to have temporarily decreased. Yet there was a clear upward trend in wealth inequality. Clark and Clark (2001) estimates the share of commons to have been only 35% of acreage by 1500 and this declined to 20% by 1750 and 7.5% by 1800 (see figure 13). Much of the rest of the land got enclosed either through private means or by acts of parliament, and such lands had Gini coefficients close to 0.94 by 1688 (Lindert, 1987).[40]

What were plausible levels of inequality in the English countryside on the eve of the industrial revolution, 1750-1800? Although commons were only 20% of land area by 1750, this was a sizeable minority of land for which inequality levels are unclear. Moreover, there are longstanding views of commons being relatively equal following the narrative by Marx (1867). Fortunately, I can estimate the distribution of land within commons using a sample of 510 parliamentary enclosure acts of the 5,265 in total. These acts enclosed commons by cataloging the land rights of all claimants and redistributing lands in accordance with the value of these rights.

Table 8 shows the inequality in distribution of acreages, aggregated to the regional level by period. As the awards were in acres rather than value, there is some measurement error in wealth distribution. Gini coefficients ranged from 0.5-0.8 in any location-period but this ignores the landless.[41] I also include an estimate of Gini coefficients assuming 30% of the population were landless, a highly conservative number. Wealth inequality seems relatively lower in Cumbria, Westmorland, and Leicestershire but absolute inequality was

[38]This calculation uses tabulated data, categorized by landholding class. I assume the lack of inequality within category making this a downward biased estimate.

[39]With a more conservative assumption of 30% landless, the Gini remains just above 0.7.

[40]The distribution of rents in enclosed lands were determined by land ownership. The numbers from Lindert (1987) implies Gini coefficients of at least 0.94 when within class land distribution is assumed to be equal.

[41]There is no clear trend in inequality over time. This is likely due to selection of more unequal areas into earlier enclosure because enclosure acts required support from landholders holding a high proportion of acreage. This is because enclosure required a high proportion of landholders weighted by landholding size.

Table 8: Inequality of Acreage Awarded by Parliamentary Enclosure

Region	Location	Year	Awards	Gini	Gini Assuming 30% Landless
South East	Buckinghamshire	1760-79	30	0.76	0.83
		1780-99	29	0.73	0.81
		1800-19	22	0.81	0.87
	Warwickshire	1720-49	12	0.78	0.85
		1750-69	35	0.71	0.85
		1770-89	38	0.72	0.80
		1790-1815	25	0.71	0.80
		1815-	15	0.75	0.83
East Midlands	Leicestershire	1757-72	9	0.61	0.72
	Nottinghamshire	1760-79	49	0.68	0.78
		1780-99	38	0.74	0.82
		1800-19	30	0.74	0.82
		1820-39	7	0.73	0.81
		1840-68	6	0.75	0.82
North West	Cumbria	1805-20	6	0.63	0.74
	Westmorland	1770-1799	3	0.48	0.63
		1800-1822	5	0.51	0.65
	Yorkshire	1725-1759	8	0.78	0.85
		1760-1779	69	0.81	0.87
		1780-1799	24	0.76	0.83
		1800-1819	34	0.81	0.87
		1820-1839	7	0.78	0.85
		1840-1859	9	0.80	0.84

Sources: Brown (1995), Crowther (1983), Martin (1967) Searle (1993), Turner (1980), Whyte (2006), Yelling (1977) high. Despite commons often being regarded as bastions of equality, in reality they were unequal. Combined with higher inequality in already enclosed areas, wealth inequality in England as a whole must have been well above 0.8. This evidence leaves little doubt that England had converged back to high inequality by 1750.

The evidence compiled in this section is consistent with Western Europe being a highly unequal region for at least the half-millenia preceding the industrial revolution. Could the same be said of their East Asian contemporaries?

East Asia

The earliest available evidence of land distribution in Japan is from the *Handen* system of the 7th to 10th centuries which was adopted from the Chinese equal fields system.[42] At the time, lands were centralized by the state and much of it was allotted to peasants. Such plots, known as *kubunden*, were often paddy fields and allotted based on the peasant's age, sex, and class.[43] There were two classes of peasants; the *ryo* 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 *ryo* class got 2 *tan* of land while females got two thirds of males. The *sen* class got one third of the *ryo* peasants in their respective age-sex category (see table 9). The system required large-scale population surveys that occured every 6 years to register all people. Any deaths resulted in confiscation of land, while those who were now older than 6 were allotted lands.[44] The system was far from perfect and there are known cases where allotted lands were far away from the homes of residents (Iyanaga, 1980).[45] Moreover, land quality must have differed to some degree. Yet, the system did give all people rights to cultivate land and keep surplus net of tax. The policy tended to keep peasant society equal.

It was possible for cultivators to rent out their allotted fields if they had permission from officials. 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).[46] Taxes are estimated to have been perhaps 5-7% of yields so there would have been 13-15%

[42]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).

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

[44]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.

[45]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.

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

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*

Table 9: The Handen system
Tan units are in Nara tan which are 20% larger than the current tan. Estimates of yield are in current koku units, assuming 315 soku of yield per Nara cho, 15 soku of taxation per cho, and 20 soku of seed per cho.

of yield being earned by peasants from land rights (Sawada, 1972). Given such lands, recent estimates of living standards suggest rice earnings amounted to perhaps 2300 kcals per day per family member of which 363 kcals of rice are earned from land rights (Midorikawa, 2016).[47] These incomes would be supplemented to some extent through non-agricultural work or tenancy. Although these figures are rough estimates due to the limited nature of the sources, the clear finding is that equality 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 driven policy or if policy simply acknowledged widespread equality.

After the collapse of the *handen* system, a feudal system based on privately held estates (*shoen*) 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*) (Nishitani, 2006). Unfortunately there are few sources to study land distribution beyond the lord's right of land ownership. Yet, it remains the case that peasants held landholding rights within this system through which relative equality could be 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, 2011). If the marginal value of labor was so low, it is doubtful that population could be sustained without supplementary income in the form of landholding incomes as can be seen in subsequent periods (Kumon, 2018). Although this remains speculation, there is a clear path through which Japan remained persistently equal for over 1200 years of history.

China has a far longer written history but the earliest reliable evidence 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. This was the policy that was later copied by the Japanese

[47] I calculate based on 314 *soku* of yield per cho, a standard assumption. The past literature had used wrong units of *sho*, a volume measure of rice, to measure yields. They suggested peasants earned 1100 kcals from their allotted fields and perhaps a little more from other work. Such numbers seem infeasible.

as the *Handen* system. 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.[48] 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.[49] However, the total allocation of 100 *mu* were also conceptualized as upper bound landholdings for peasants and prevented the accumulation of landholdings (Mitani, 2015). Overall, the system tended to keep society relatively equal.

Estimates of inequality from other periods indicate equality relative to Western Europe but perhaps higher inequality than Japan.[50] 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 landholdings 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. 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.[51] In terms of trends, he finds little change in inequality since the 1880s using the limited available data.

The overall impression is that inequality had no clear upward trend over the very long run. Consequently, East Asian societies never seem to have converged towards inequality levels approaching those in Western Europe. Of course, the evidence is sketchy and far from decisive. However, I believe the evidence is sufficient to conjecture that East Asia was characterized by a persistent equality.

Conclusion

This study has characterized the levels and trends of inequality of land in Western Europe and East Asia. Two consistent finding over the very long-run, from both before and after the black death, emerged. Western Europe converged towards high inequality leading to societies based on landless laborers. The black death was not a turning point towards high inequality. In stark contrast, East Asian societies appear to have converged towards signif-

[48]See (Von Glahn, 2016) 185

[49]This contrasts with the *Handen* system of Japan where the allotments were policy goals that were deemed achievable.

[50]The figures for the 11th century–18th century come from Von Glahn (2016).

[51]Rice based lands could have perhaps triple the land value compared to wheat. Thus, even a perfectly equal distribution of land in value will have unequally distributed land acreage. Furthermore, this estimate does not account for topsoil rights which were enjoyed by many smallholders.

icantly lower levels of inequality leading to peasant societies. Despite both regions having highly sophisticated societies, they were consistently developing along different trajectories. Differences in inequality may have distinguished these two regions. The documented inequality patterns has implications on the historical development literature that links inequality to growth (Galor and Moav, 2004).

One interesting question is where other regions fit within this framework. Evidence from the Philippines in 1903 show the share of farms cultivated by tenants to have been only 19%. This suggests another highly equal society. Yet, the similarities with East Asian societies ends there, as the literature suggests Southeast Asia had an abundance of land with swidden agriculture being dominant (Elson, 1997). This contrasts with both Japan and China which hit ecological problems due to the scarcity of land (Totman, 1989). A third type of region may exist, in which land is equally distributed by default due to disinterest in owning an abundant resource (Fenske, 2013).

This paper also begs the question of why East Asia was so different from Western Europe. The implication of this paper is that any explanation must be valid over the 500-1000 years preceding the industrial revolution. Something was very different between East Asia and Western Europe long before the black death.

Appendices

Alternative Estimates of Inequality

Table 10 shows estimates of inequality when I only backwardly project inequaliy within prefectures if I have no village observations. Table 11 shows estimates of inequality when I only use predicted levels of inequality. In either case, there is little n

Table 10: Estimated Inequality by Region

Region	Gini	Prop. Landless	Prop. Wealth top 20%	Prop. Wealth Bottom 40%	Villages
Kyushu	0.53	0.11	0.58	0.07	3
Shikoku	0.51	0.10	0.60	0.08	1
Chugoku	0.51	0.08	0.56	0.08	27
Kinki	0.61	0.27	0.67	0.04	14
Tokai	0.50	0.10	0.54	0.08	44
Chubutosan	0.62	0.18	0.65	0.05	60
Hokuriku	0.62	0.22	0.68	0.04	152
Kanto	0.47	0.06	0.54	0.11	197
Tohoku	0.51	0.16	0.57	0.09	93
All Regions	0.53	0.13	0.59	0.08	591

I take one observation per village that is closest to 1800. For all regions I take the weighted average by population. I only backward project for prefectures with no observations.

Table 11: Estimated Inequality by Region: Predicted

Region	Gini	Prop. Landless	Prop. Wealth top 20%	Prop. Wealth Bottom 40%	Villages
Kyushu	0.53	0.13	0.60	0.08	3
Shikoku	0.56	0.13	0.62	0.07	1
Chugoku	0.55	0.13	0.61	0.07	27
Kinki	0.55	0.13	0.61	0.07	14
Tokai	0.55	0.13	0.60	0.07	44
Chubutosan	0.53	0.13	0.59	0.08	60
Hokuriku	0.58	0.13	0.63	0.06	152
Kanto	0.53	0.13	0.59	0.08	197
Tohoku	0.47	0.14	0.53	0.10	93
All Regions	0.54	0.13	0.60	0.07	591

For all regions I take the weighted average by population. I backward project for all prefectures.

Inequality in Pre-industrial England

Medieval England

Medieval English peasants were split into free and unfree peasants at this time. The difference was that unfree peasants had labor obligations for the lord in addition to higher rents, no access to courts, and other taxations such as the heriot, a death-duty. Therefore, free peasants received more income from holding land than unfree peasants, resulting in one type of inequality. Kanzaka (2002) lists the rent paid by each of these types of laborers, in addition to the shares of each type by landholding class. Unfortunately there is no estimate of land income for each type of peasant.

Therefore, I estimate this by estimating total land's share of income and subtract the rents of each type of laborer. I take land's share of income as 40% of yields and labor's share as 50% of yield taken from table 14 of Allen (2006).

$$Land\ Income\ net\ of\ rent = days\ of\ work \times wage \times \frac{0.4}{0.5} - land\ rent\ per\ acre \times acres\ worked$$

I assume a laborer worked 250 days. Using average wages (1277-1282) from Clark (2007), the total wage income is 432.5 pence. This brings land's share of income, the first component on the right hand side, to 346 pence. If a farmer owned and cultivated 30 acres over one year with 250 days of work (the standard virgate in this region), the land income net of rents for the peasant is 133 pence for unfree peasants and 214 pence for free peasants. This is

4.4 pence per acre for unfree peasants and 7.1 pence per acre for free peasants. Thus, free peasants are assumed to earn 1.6 times more rent per acre.

I then estimate the implied Gini coefficient assuming differences in land incomes net of taxation by peasant class. The resulting Gini range between 0.7-0.8 depending on assumptions of the share of unrecorded landless ranging from 30% to 50%.

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