The Long Shadow of History in China:

Regional Governance and Chinese Territorial Inequality

Abstract

Do external shocks affect local government quality and, consequently, long-term economic development? The collapse in 1911 of the Qing Dynasty in China was one of the greatest institutional shocks in world history, marking the end of more than 2,000 years of imperial rule. We exploit this shock to examine the impact of changes in historic local government quality on economic development today. By measuring variations in governance quality across 1,664 Chinese counties and examining their impact on long-term economic development, we show that historical differences in local governance quality are strong predictors of current geographical differences in economic development. This positive relationship is robust to a rich gamut of controls and checks. To further address causality issues, we instrument historical government quality with the location of military towns in the preceding Ming dynasty. The analysis shows that history has left a deep legacy on governance differences across China that determine, to a considerable extent, current Chinese regional inequalities.

Keywords: Government quality, Shock, Institutions, Inequality, Regions, China

1. Introduction

Institutional quality has long been considered one of the main pillars of economic development (Acemoglu et al., 2001; La Porta et al., 1998; Rodríguez-Pose, 2013). Good government institutions, such as the effective rule of law, low levels of corruption, and efficient protection of property rights, are at the root of differences in development (Acemoglu & Johnson, 2005; Fukuyama, 2006; Rothstein, 2011). Weak government institutions are also increasingly considered important across developing countries (e.g., Acemoglu et al., 2015; Iddawela et al., 2021; Jia, 2014; Michalopoulos & Papaioannou, 2014). Government quality matters at both the national and sub-national levels. However, how much social and political stability is needed for government quality to have an impact on economic performance? Can deeply rooted historical differences in government quality persist after experiencing large institutional shocks?

China provides an ideal setting to analyse the interaction between formal institutions and shocking events, not just because of its economic importance and recent dynamism, but also because of its long and rich history as a relatively well-organised and structured empire (Koss, 2017; Kuhn, 2002; Spence, 1990). The rise and fall of the empire undoubtedly had a huge impact on the entire country. The demise of China's last imperial dynasty happened during the 1911 Revolution (also known as the Xinhai Revolution), when China's last emperor, Pu Yi, announced his abdication on 12 February 1912. This marked the end of over 2,000 years of imperial rule and the beginning of China's republican era. A political system that had lasted more than two millennia suffered a sudden and abrupt collapse.

The fall of the Qing Dynasty unleashed events that have had a fundamental impact on the country and the lives of ordinary Chinese over the last century. The Empire's downfall brought about momentous political transformations, radical changes to traditional Chinese culture and values based on Confucianism, and, more recently, a complete overhaul of the country's economy. China was undoubtedly thrust into a completely different era after 1912. However, do these deep-seated changes mean that the influence of institutions brewed over two millennia of imperial rule no longer count for anything? Or do they still shape differences in development across the country?

This paper aims to address this issue by checking whether historical institutions continue to affect the country's long-term economic performance after the collapse of the last imperial era. To assess historical government quality, we have digitalised one of the most influential

institutions in the Qing dynasty: *the Chongfanpinan* system. This political institution, implemented in 1731, led to a durable civil service system, which was not abolished until the collapse of the Qing dynasty in 1911. By adopting this system, the central government actively contributed to determining the quality of local governments in China by allocating bureaucratic resources differentially. In other words, more and better human resources were awarded to selected counties to improve governance. *Chongfanpinan* contributed to an important divergence in local government quality, as the chosen counties were allocated the best administrators and attracted more resources.

The analysis examines the extent to which current differences in economic development are determined by differences in local government quality during the late imperial times. We have digitised the *Chongfanpinan* government quality data by hand using the historical records called 'Veritable Records of the Qing Emperors (*Qingshilu*)'. These records were later combined with indicators of current economic development at county level. The current development indicator is elaborated using satellite images obtained in 2010 of night time light density. The results of the analysis show that the shadow of history in China is still very long. In spite of the substantial changes brought about by modernisation in the last century, differences in government quality in imperial times still determine variations in economic development this century. Chinese counties with better historical government quality as a result of the long-term implementation of the *Chongfanpinan* system are today more developed than those with lower-quality government a century ago. This connection between historical governance quality and current levels of economic development is robust to the inclusion of a rich gamut of covariates, including county-level geographic, historical socio-economic, and contemporary socio-economic controls, as well as prefecture-level fixed effects.

To further address causality concerns, we have instrumented differences in imperial-time government quality with the location of military towns during the Ming dynasty (1368–1644), which preceded the Qing dynasty). More specifically, we have constructed a measure of vulnerability to military conflicts, based on the location of garrisons in the Ming dynasty, to isolate exogenous variation in the decision to select counties. The imperial government of the time prioritised counties that were close to borders or in areas prone to military conflict.

This research contributes to the political economy literature on how political factors affect economic geography. In contrast to existing studies (Ades & Glaeser 1995; Campante & Do, 2014; Davis & Henderson, 2003), our focus has been on the effect of sub-national historical

conditions on contemporary economic outcomes. We revealed some new factors underlying the link between deep-rooted institutional structures and economic development. We also contribute to a growing literature examining how historical institutions affect the process of development (Chen et al., 2017; Dell et al., 2018; Duranton et al., 2009; Michalopoulos & Papaioannou, 2013). More precisely, our study uses a historical indicator of governance quality that is, to the best of our knowledge, unique. As such, it relies on criteria first developed by bureaucrats and civil servants to construct the indicator of institutional quality.

The remainder of this paper proceeds as follows. Section 2 describes the literature and historical context of the imperial governance system and the shock of the collapse of the Qing dynasty. Section 3 introduces the data used in the analysis and presents the descriptive statistics. Section 4 reports the estimation results. Section 5 examines the two possible channels through which historical governance conditions continue to influence economic development patterns at the county level in China, while Section 6 further tests the effect of Western shocks on the imperial governance system. Section 7 offers the main conclusions.

2. Institutional background

As background to our analysis, we first discuss the definition and perspective on the government quality we adopt, before describing our measurement of historical local government quality and the collapse of the Qing dynasty, the last imperial dynasty. This discussion aims to link historical institutional quality with the external shocks in the Chinese context.

2.1 An alternative approach to measuring government quality

Since at least the 1990s, institutions have generally been treated as key factors in shaping economic development (La Porta et al., 1998; North, 1990). Government quality, in particular, has attracted considerable attention. This is a multifaceted concept, encompassing all elements conditioning the government capacity to provide public goods and services. One of the most commonly used definitions of government quality comes from Rothstein and Teorell (2008: 165), who consider government quality as 'the impartiality of institutions that exercise government authority'. This concept links with that of good governance, viewed as 'the traditions and institutions by which authority in a country is exercised' (Kraay et al., 2010:5).

Based on these and related definitions, the World Bank compiled the widely used Worldwide Governance Indicators, a set of measures of quality of government for 136 countries. This indicator inspired similar measurements at a regional level for the European Union.

Most government quality measurements rely on subjective indicators. Calculating government quality based on surveys and/or interviews is certainly a valid approach but also has some limitations. First, in certain political regimes it may not be feasible to obtain data on government quality simply through interviews, as those surveyed may not be able to express themselves freely. In some cases, academic institutions or international organisations may not be permitted by the local government to conduct interviews on government administrative capabilities. Moreover, historical records of government quality based on surveys are inexistent; therefore, relying solely on interview data is frequently only valid to examine either recent or current government quality.

To fill this gap, we follow Fukuyama's (2013) broader definition of government quality. He defines government quality as 'a government's ability to make and enforce rules, and to deliver services, regardless of whether that government is democratic or not'. Following this perspective, we consider that an efficient bureaucracy —according to a rationalistic Weberian approach— will produce better services than one that is highly discretionary or riven by nepotistic and clientelistic ties. Well trained and efficient officials and bureaucrats represent the human capital of a government and facilitate the efficient delivery of public goods and services. Several empirical studies have uncovered the connection between well-trained bureaucrats and efficient governments (Balan et al., 2020; Fukuyama, 2013; Xu, 2018). In this research, we follow this approach and measure government efficiency through the level of training and professionalisation of the civil service.

2.2 Historical differences in local government quality in China

It was not until a century into the Qing dynasty that a comprehensive reform aimed at discriminating among counties and improving the quality of local government was implemented. In 1731, Emperor Yong Zheng, the fourth emperor of the Qing dynasty, set up a local governance system called *Chongfanpinan*. The overall aim of the *Chongfanpinan* system was to improve the use of the limited human and financial resources by allocating more resources and, especially, better trained civil servants to those counties considered to be of strategic importance for the Empire (Liu, 2012). The objective of the reform was to solve challenges in local governance by reducing complexity and allowing the imperial bureaucracy to better deal with the diverse conditions of its territories (Scott, 1998).

The establishment of the *Chongfanpinan* system represented a fundamental bureaucratic reform of governance in China. The Chinese state selected locations to place more and better human and economic resources based on a series of suitability criteria. These criteria included: (i) the importance of transport, (ii) the complexity of government affairs, (iii) the difficulty of tax collection, and (iv) the regional security situation (Liu, 1993). Different counties in China were classified according to these criteria. The more they met the conditions, the greater the likelihood of receiving more resources through the *Chongfapinan* system. Meanwhile, the central government was also concerned about military factors. Maintaining social stability and territorial unity was of paramount importance to uphold peace and prosperity in what fundamentally was a centralised empire (Spence, 1990). Putting all these criteria together, a four-county tier system was established. Counties with a score of four were ranked highest; those with a score of one were ranked lowest.

The allocation of a county to a specific tier had consequences. First, the highest-ranked counties were deemed of strategic importance for the Empire and rewarded with additional human resources. The highest qualified and, in theory, more efficient bureaucrats were posted to top-tier counties —those awarded the greatest importance in the Chinese territorial hierarchy. To ensure that the Empire remained strong and prosperous, top-tier counties were be governed by bureaucrats with a wealth of experience in governance and the best educational background possible (Wang, 2007). Matching competent officials with top-tier places was believed to maximise the efficiency of governance.

Secondly, the allocation of well-prepared and high-ranking officials meant a *de facto* higher degree of decentralisation in top-tier counties. In counties that, according to the *Qingshilu*, were ranked higher than tier 2, provincial governors could participate in the process of appointing and dismissing local officials. In contrast, authority over civil servants in the remaining low-tier counties was kept under the strict control of the Ministry of Personnel in the central government. The rationale for this *de facto* political decentralisation in top-tier counties was that the provincial governors were more familiar with local conditions and understood the human capital needs of specific counties in their provinces. This practice limited the power of the distant and often aloof Ministry of Personnel in Beijing and promoted greater autonomy in the places deemed to be governed better (Hucker, 1985).

To sum up, the *Chongfanpinan* system represents the first known and widespread record associated with potential differences in the quality of local governance across a large number of sub-national administrations in a historical polity. The classification of different counties into different tiers had far-reaching consequences in terms of governance changes, as the top-ranked counties were allocated better resources for the handling of administrative affairs. This would have contributed to a greater spatial inequality in local governance quality in China, which grew over more than two centuries until the demise of the *Chongfanpinan* system with the downfall of the Qing dynasty in 1912.

2.2 The collapse of the Qing dynasty

The collapse of Imperial China at the beginning of the 20th century represented a complete break from the past. Imperial China, under the Qing dynasty, had grown increasingly inefficient. It had failed to modernise, leading to a weak state unable to confront the influence of Western powers. Discontent in elite groups, often established overseas, and the population in general, became more and more evident since the 1890s. The Revive China Society (*Xingzhonghui*) — founded by Sun Yat-sen in Honolulu in 1894 [1] — was most prominent among these revolutionary groups. The early uprisings were quickly suppressed by the government. However, the insurrections kept on growing and, after the success of the Wuchang Uprising in Hubei province on 10 October 1911, the position of the Qing dynasty became untenable. Just two months after the Wuchang Uprising, fifteen provinces, including Hunan and

[1] The Revive China Society is the predecessor organisation of the Kuomintang (KMT).

Guangdong, had declared their independence. The revolution ended with the abdication of Emperor Pu Yi, marking the beginning of China's republican era.

The collapse of the Qing dynasty represents a fundamental turning point in Chinese history and one that has had a profound impact on the development of modern China, as it unleashed a series of transformations that turned Chinese traditional society and polity upside down. In politics, the demise of the Qing dynasty initiated China's political modernisation. Politicians tried to learn from the American political system and set up a presidential republic. Although the republican system was not implemented in the early years of the Republic of China, the values of democracy and republic were widely disseminated. From a cultural perspective, the authority of traditional Chinese culture and values based on Confucianism was severely shaken —a transition that was rapidly accelerated with the advance of communism. In economic terms, China has since embarked on several industrialisation and economic transformation waves, which are transforming China from the economic laggard that it had become at the end of the Qing dynasty into one of the main locomotives of the world economy. The demise of the Qing dynasty ushered a completely different era for China. However, did these changes do away with the institutional traditions established over centuries in Imperial China? In this paper, we aim to answer this question.

3. Data and descriptive analysis

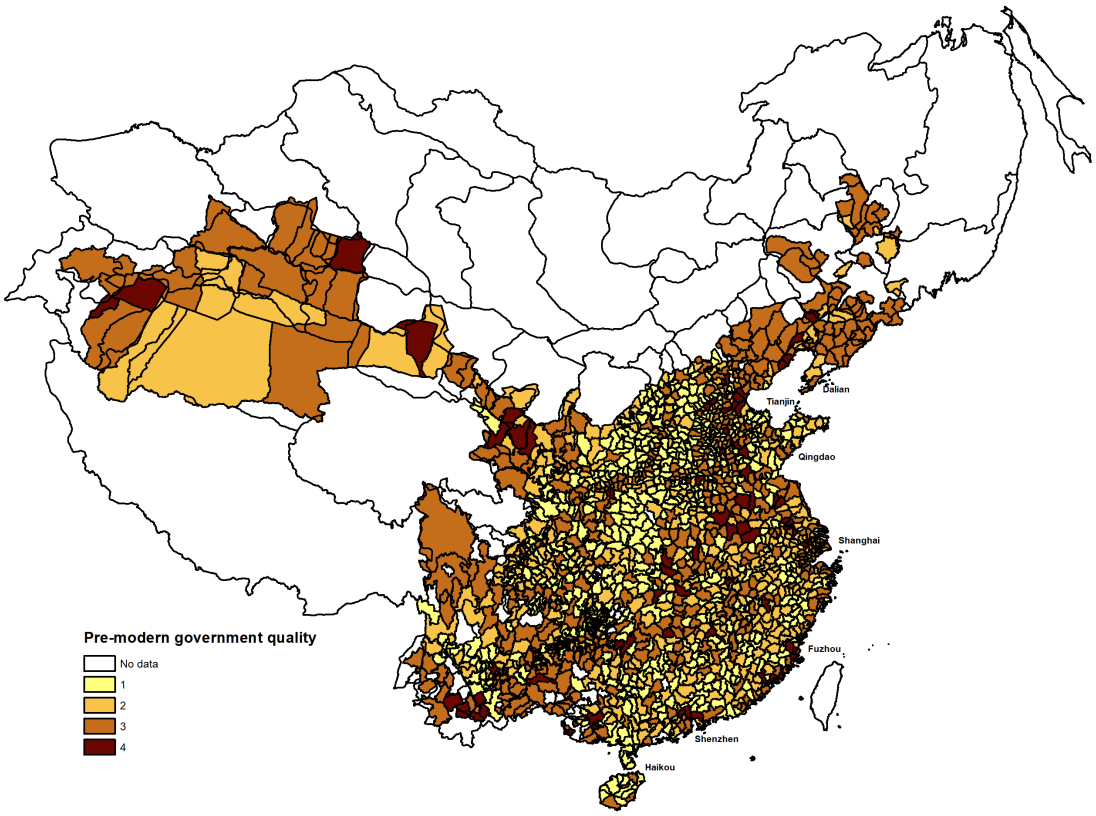
3.1 Data on historical government quality

To explore the relationship between historical government quality and current territorial inequalities, we first map historical county differences in governance quality, according to the *Chongfanpinan* reform. This involved digitalising the textual data recorded in the Veritable Records of the Qing Emperors (*Qingshilu*).[2] The *Qingshilu* contains the official compilation of historical records of the Qing dynasty, including a large number of political, economic, cultural, and geographical aspects. The *Chongfanpinan* system is one of the many records in the *Qingshilu*. To better represent the data contained in the *Qingshilu*, we use a map containing

[2] The detailed approach to digitalising the historical data is illustrated in Appendix A.

the county borders of the Qing dynasty as they were in 1820.[3] The data of 1,664 counties in total were digitalised (Figure 1), containing the overwhelming majority of the population of modern China. The counties not included in the analysis (mostly in territories in present-day Tibet, Qinghai, and Inner and Outer Mongolia) were border areas where the Qing government did not implement the *Chongfanpinan* reform.[4] Interestingly, as Figure 1 shows, counties with higher state capacity were not, as might be expected, overwhelmingly concentrated in the economically developed coastal regions.

Figure 1. Historical government quality between 1731 to 1911



3.2 Night-time satellite light density

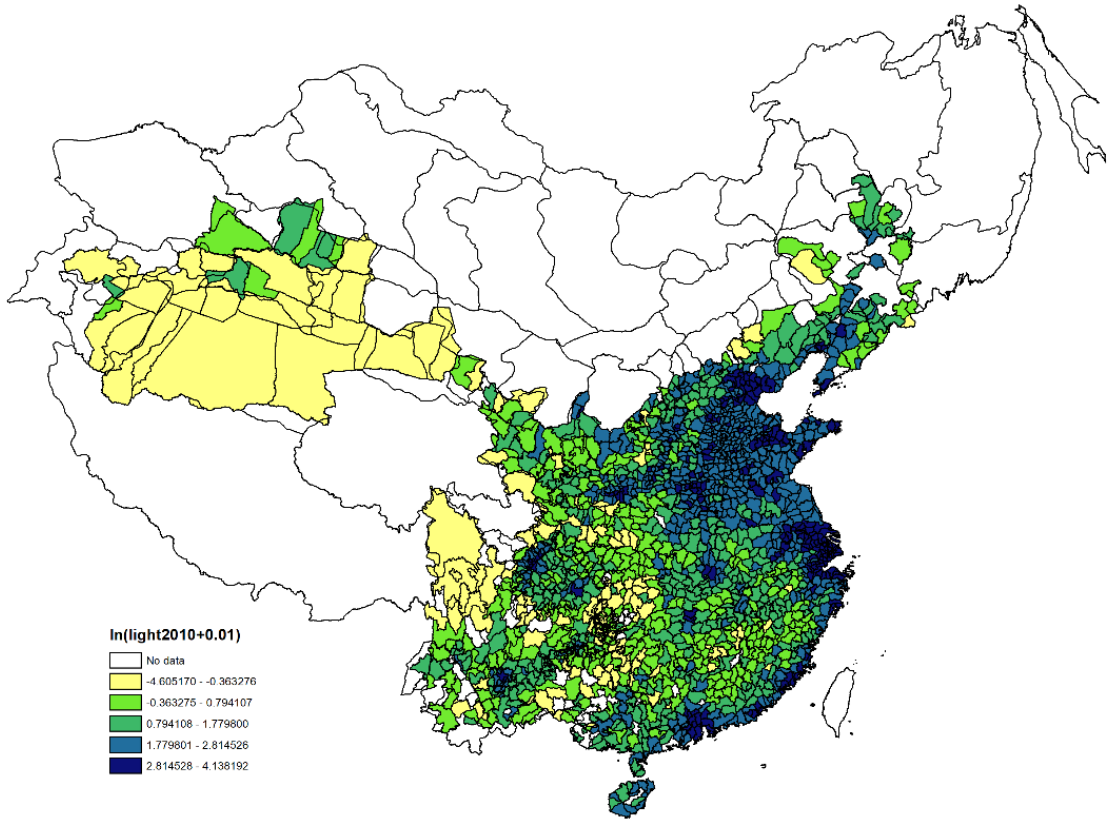
Given the lack of an exact correspondence between historic and present-day county boundaries, we follow Henderson et al. (2012) and use satellite data of night-time light luminosity in 2010 to measure current levels of economic development. Research using this method has proven that night light data is a reliable indicator for measuring local economic development

[3] The border file was provided by CHGIS (2007).

[4] Moreover, some border regions, although formally part of the Chinese Empire, were not under the *de facto* jurisdiction of the Qing dynasty.

(Michalopoulos & Papaioannou, 2013; Storeygard, 2016; Frick et al., 2019). In our case, night-time satellite light density has the advantage that a) we can combine historical boundaries to current levels of development in a more accurate way than by using official GDP data, and that b) it allows us to overcome the unreliability of some Chinese county-level GDP data (e.g., Chen et al., 2019; Michalski & Stoltz, 2013). Figure 2 provides an overview of the 2010 level of development in historical counties of China, using night light luminosity as a proxy.

Figure 2. Night light luminosity in 2010



3.3 Control variables

Current levels of development in China are not simply the result of historical differences in the quality of local governance. Indeed, a large number of other factors play a role in deciding why certain Chinese counties are more developed than others. To take these factors into account, we use four categories of control variables, which are likely to influence current local levels of prosperity in China. These categories include geographic factors, historical and contemporary socio-economic factors, and prefecture-level fixed effects.

Geographic factors. We consider several key geographical features: longitude, latitude, the size of land area, average slope, and elevation. Pomeranz (2009) argues that, in the case of China, natural conditions played a fundamental role in determining China's transition from the pre-modern to the modern era, leading to the great divergence in wealth between China and Europe. Longitude and latitude have also featured prominently in accounts of differences in economic development by several social scientists (Diamond, 1998; Sachs, 2001), as has also been the case of ruggedness (Nunn & Puga, 2012).

Historical socio-economic factors. We also control for a series of historical socio-economic factors, which might have influenced historical differences in development in China. We consider whether a county was a local capital during the Qing dynasty, its distance to the coast or the Grand Canal, its distance to the national capital (Beijing), and local agricultural yields. Being a local capital during the Qing era would have attracted resources and development. Similarly, distance to the national capital and the Grand Canal may have contributed to trade and prosperity (Bai & James, 2015). The coast was the gateway to outside technology, knowledge and trade (Chen et al., 2017), giving coastal counties —and those nearby— a considerable economic advantage.

Contemporary socio-economic factors. To tease out the contemporary socio-economic effects, we use the population census data at county level in 2010.[5] We take into consideration the average years of schooling of the adult population, manufacturing and urbanisation ratios, and population density. As there are boundary changes between counties between the Qing dynasty and modern China, we employ GIS techniques to map contemporary data to the county boundary in the Qing dynasty. Appendix B explains the process of data construction in detail.

Prefecture fixed effects. The prefecture represents the division above the county level in the Chinese administrative structure, which encompasses between five and ten counties. Since China is a big and diverse country, it is difficult to compare counties across directly due to cultural and geographical differences. Therefore, introducing prefecture fixed effects, captures other unobserved effects. The sources and descriptive statistics of all the variables are summarised in Appendix Table A1.

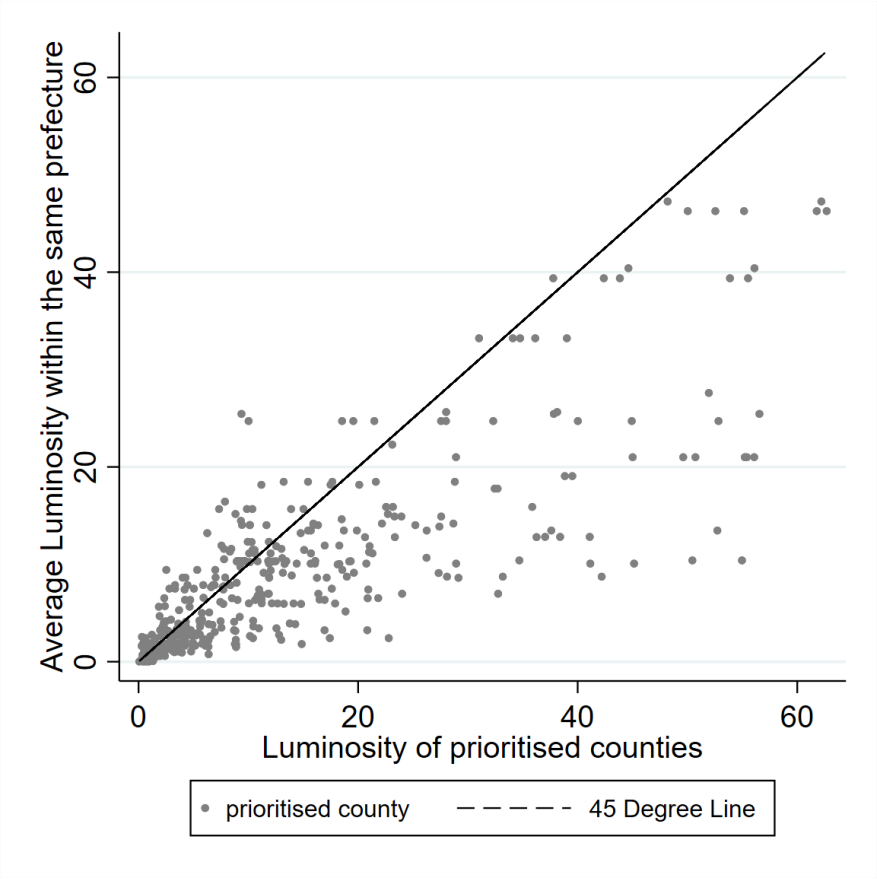
[5] The reliable county level data could only be achieved through population census. Generally, China conducts a population census every 10 years. The latest census data is in 2010.

Table 1. Summary statistics of historical government quality, overall

variable	obs.	mean	sd	p25	p50	p75	min	max
Panel A: All Observations								
nightlight	1,664	8.622	10.444	1.947	4.931	11.199	0.019	62.679
ln(0.01+nightlight)	1,664	1.502	1.252	0.669	1.598	2.417	-3.532	4.138
Panel C: hierarchy=1								
nightlight	652	6.596	7.058	1.798	4.022	9.188	0.062	50.400
ln(0.01+nightlight)	652	1.364	1.100	0.592	1.394	2.219	-2.620	3.920
Panel D: hierarchy=2								
nightlight	445	8.582	10.458	2.060	5.002	11.350	0.074	60.651
ln(0.01+nightlight)	445	1.519	1.212	0.728	1.612	2.430	-2.482	4.105
Panel E: hierarchy=3								
nightlight	493	11.679	11.939	1.917	5.770	13.217	0.019	62.679
ln(0.01+nightlight)	493	1.569	1.385	0.656	1.754	2.582	-3.532	4.138
Panel F: hierarchy=4								
nightlight	74	16.935	17.131	3.697	11.541	26.23	0.260	56.078
ln(0.01+nightlight)	74	2.173	1.331	1.310	2.447	3.267	-1.311	4.027

The descriptive statistics for the dependent variable (current levels of development) at different ranks of the independent variable of interest (Qing dynasty county governance tier) are presented in Table 1. The mean value of luminosity at the county level in 2010 is 8.622, while the median is significantly lower at 4.931. There are, however, large differences in luminosity across counties, which can be related to historical differences in local governance. The mean luminosity in the counties in tier 1, according to the *Chongfanpinan* system of measurement, is 6.596. For counties in tier 2 it is 8.582, and it increases successively, reaching 11.679 and 16.935 for tiers 3 and 4, respectively. This suggests that counties with better historical governance quality are economically far better off today. To ensure that the reported differences are not driven by a few outliers, we plot the mean luminosity of counties in the top historical *Chongfanpinan* ranks (those in tier 3 and tier 4) vis-à-vis counties with a lower rank within the same prefecture and find the economic development much better (to the left of the 45-degree line) in the great majority of cases (70%) (Figure 3).

Figure 3. The luminosity of prioritised counties and normal counties within the same prefecture



4. Empirical analysis

4.1 Empirical setup

In order to examine whether a higher score in the *Chongfanpinan* —indicating better local governance between one and three centuries ago— has influenced current territorial disparities in China, we use the following specification:

$$y_{i,p} = \beta Historical\ government\ quality_{i,p} + \gamma_1 X_{i,p}^{g} + \gamma_2 X_{i,p}^{h} + \gamma_3 X_{i,p}^{c} + \alpha_p + \varepsilon_i \qquad (1)$$

where the dependent variable $y_{i,p}$, reflects the level of economic development of county i in prefecture p in 2010, proxied by night light density. $Historical\ government\ quality_{i,p}$ is the explanatory variable of interest. It denotes local governance quality in county i in prefecture p under the *Chongfanpinan* reform during the later period of the Qing dynasty between 1731 and 1911. The equation includes several controls, which can affect differences in present-day levels of development across China. $X_{i,p}^{g}$represents a series of geographic controls, including

land area, longitude, latitude, slope, and the ruggedness of the county topography i in prefecture p. $X_{i,p}^{h}$ controls for historical socio-economic factors, such as whether the county was the seat of a prefectural capital in historical times, its distance to the national capital (Beijing), distance to the coast, distance to the Grand Canal, and agricultural yields of county i in prefecture p. $X_{i,p}^{c}$ considers several contemporary socio-economic factors, including population density, years of schooling of the adult population, and the urbanisation and manufacturing ratios of county i in prefecture p. All regressions are conducted with prefecture-level fixed effects.

4.2 Baseline results

Table 2 reports the baseline results conducted using OLS. These show that there is a positive and highly significant association between historical governance quality and present-day development levels in China. In Column (1), including only prefecture-level fixed effects, the coefficient on the historical government quality is positive and highly significant (0.210). The coefficient also remains significant when geographic controls are included in column (2). Physical geography factors, such as latitude and longitude as well as terrain ruggedness, do not determine current differences in economic prosperity, which is slightly inconsistent with previous research (Diamond, 1998; Sachs, 2001), but aligned with the literature that has highlighted the primacy of institutions over geographical factors (Ketterer and Rodríguez-Pose, 2018; Rodrik et al., 2004). Column (3) shows that governance quality in the late Qing period is robust after controlling for historical socio-economic factors. Places located close to Beijing or the coast are wealthier than more distant ones. Chen et al (2017) also found that being close to the coast matters for economic prosperity in China. The results are also robust to the introduction of contemporary socio-economic factors (Column (4)). Greater shares of urbanisation and manufacturing and a more educated population are all connected with higher levels of GDP per head today. The introduction of additional controls —and fundamentally and as expected, of contemporary socio-economic controls— lowers the coefficient of historical governance quality. However, it remains positive and significant at a 99% confidence level throughout.

Table 2. Impact of historical government quality on county night light luminosity in 2010: OLS estimate, overall

VARIABLES	(1)	(2)	(3)	(4)
	Night light luminosity in 2010			
Historical government quality	0.210***	0.235***	0.218***	0.110***
	(0.0256)	(0.0223)	(0.0221)	(0.0233)
Land area (logged)		-0.329***	-0.313***	-0.224***
		(0.0516)	(0.0496)	(0.0441)
Longitude		0.0796	0.0868	0.00785
		(0.0606)	(0.0551)	(0.0398)
Latitude		0.0935	0.0760	0.0739
		(0.0665)	(0.0596)	(0.0543)
Slope		-2.162***	-2.406***	-1.762***
		(0.327)	(0.322)	(0.289)
Elevation (logged)		-0.0903	-0.0248	-0.0761
		(0.0554)	(0.0497)	(0.0481)
Prefectural capital			0.101	0.0314
			(0.0758)	(0.0627)
Distance to the coast			-0.199***	-0.0939**
			(0.0548)	(0.0415)
Distance to the Grand Canal			-0.0490	0.00663
			(0.0457)	(0.0391)
Distance to Beijing			-0.161***	0.0223
			(0.0449)	(0.0454)
Agricultural yields (logged)			0.0806	0.185
			(0.181)	(0.118)
Human capital (logged)				2.061***
				(0.306)
Urbanization ratio				1.207***
				(0.235)
Manufacturing ratio				0.0155***
				(0.00300)
Population density				149.5
				(112.3)
Constant	0.433***	-9.778*	-5.928	-6.933*
	(0.0767)	(5.568)	(5.156)	(3.640)
Geographic controls	N	Y	Y	Y
Historical socio-economic controls	N	N	Y	Y
Contemporary socio-economic controls	N	N	N	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	1,664	1,664	1,638	1,456
R-squared	0.737	0.811	0.811	0.858

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Table 3, we repeat the exercise by treating our variable of interest, historical government quality, as an ordinal variable. Treating a variable of interest as an ordinal variable could

facilitate the interpretation of results, particularly if the hierarchical levels have different impacts. The reference group is the counties with the lowest historical government quality (those historically awarded a score of one). The results show that county night light luminosity in 2010 increases as historical government quality levels improves. For example, in column (1) —including only prefecture-level fixed effects—, the average night light luminosity of counties that were historically ranked in the top government quality tier is US$1,086.44 higher than that of counties at the bottom of the government quality scale.[6] Including all the control variables narrows the gap between the two groups to US$661.60 (column (4) of Table 3), but the gap remains significant and robust.

Overall, the results point to a strong legacy of past local governance in China on present-day economic outcomes. Counties that were deemed more strategically important and/or better governed and that, as a consequence, were allocated better trained and more able bureaucrats during the Qing dynasty are today far more developed than those that had weaker governance and were not prioritised in terms of resources. This result is robust to the introduction of many controls that could have helped make the county better off in both historical and present times.

[6] This figure is based on a back-of-envelope calculation: 4,550.45*e^0.280 /8.622. USD 4,550.45 was China's per capita GDP in 2010; 8.659 was the average luminosity in that year.

Table 3. Historical government quality on county night light luminosity in 2010: OLS estimate; variable of interest as ordinal variable

VARIABLES	(1)	(2)	(3)	(4)
	Night light luminosity in 2010			
Hierarchy 2	0.240***	0.239***	0.232***	0.167***
	(0.0547)	(0.0477)	(0.0477)	(0.0466)
Hierarchy 3	0.391***	0.455***	0.420***	0.236***
	(0.0606)	(0.0500)	(0.0500)	(0.0470)
Hierarchy 4	0.722***	0.750***	0.711***	0.226**
	(0.114)	(0.103)	(0.104)	(0.105)
Land area (logged)		-0.328***	-0.313***	-0.222***
		(0.0515)	(0.0496)	(0.0439)
Longitude		0.0793	0.0860	0.00324
		(0.0607)	(0.0553)	(0.0393)
Latitude		0.0923	0.0758	0.0732
		(0.0666)	(0.0595)	(0.0538)
Slope		-2.155***	-2.396***	-1.751***
		(0.325)	(0.321)	(0.289)
Elevation (logged)		-0.0922*	-0.0268	-0.0731
		(0.0556)	(0.0499)	(0.0491)
Prefectural capital			0.105	0.0249
			(0.0758)	(0.0623)
Distance to the coast			-0.200***	-0.0963**
			(0.0551)	(0.0410)
Distance to the Grand Canal			-0.0473	-0.00400
			(0.0471)	(0.0351)
Distance to Beijing			-0.158***	0.0181
			(0.0459)	(0.0457)
Agricultural yields (logged)			0.0813	0.190*
			(0.178)	(0.115)
Human capital (logged)				2.097***
				(0.310)
Urbanization ratio				1.198***
				(0.235)
Manufacturing ratio				0.0154***
				(0.00300)
Population density				165.7
				(116.7)
Constant	0.673***	-9.461*	-5.666	-6.214*
	(0.0606)	(5.562)	(5.213)	(3.602)
Geographic controls	N	Y	Y	Y
Historical socio-economic controls	N	N	Y	Y
Contemporary socio-economic controls	N	N	N	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	1,664	1,664	1,638	1,456
R-squared	0.737	0.811	0.811	0.859

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3 Causal identification

To what extent does the fact that better-governed counties during the Qing dynasty could have been those that were already better off affect our results? The *Chongfanpinan* reform may have fundamentally favoured rich counties and, thus, contributed to accentuating already existing historical territorial disparities in China. Moreover, there is also the risk that, despite the large number of controls included in the analysis, omitted variables may bias the results. To deal with these concerns, we employ an instrumental variable (IV) approach.

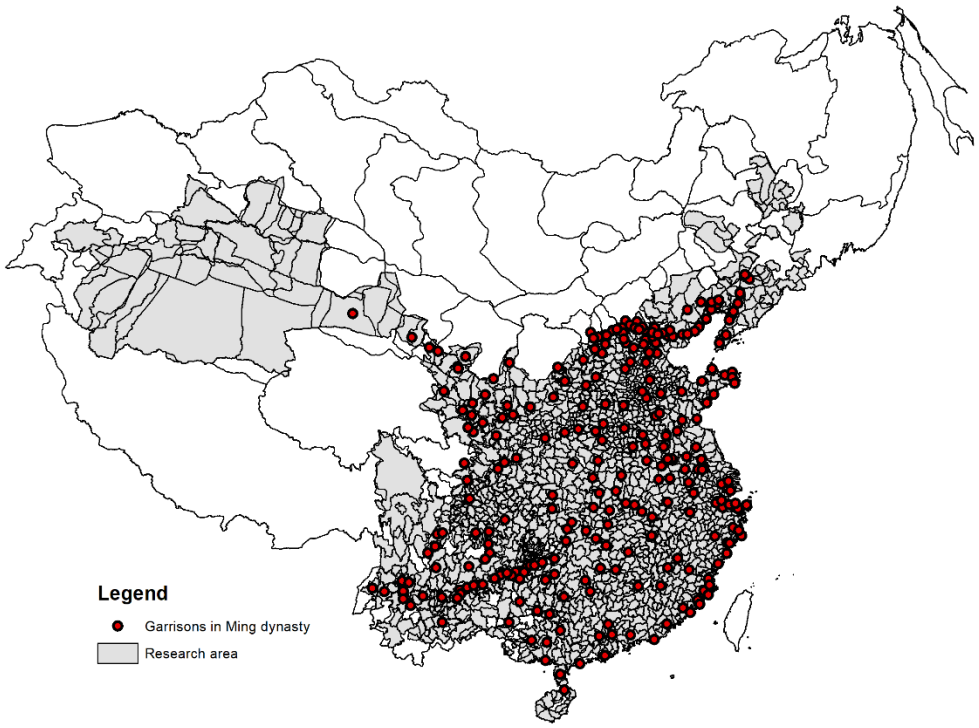
4.3.1 The location of garrisons as the instrument variable

To isolate exogenous variation in the decision to select counties, we construct measures of vulnerability to military conflicts based on the location of garrisons during the Ming dynasty (1368–1644), the dynasty that preceded the Qing dynasty.[7] During the Ming period, the Chinese government granted more autonomous powers to counties that were close to the military front lines. This was considered a measure that would allow them to respond quickly to military threats. In border areas provincial governors could freely choose local officials who were suitably acquainted with local characteristics. The arrival of the Qing dynasty led to the demise of the Ming-era garrison system in 1711 (Mao, 2018). It was replaced by a new military order, known as the Eight Banners stationary military system (Ding, 2003). Thus, the distance to the garrison in the Ming regime was completely exogenous from decisions to classify counties at particular levels of government quality in the *Chongfapinan* system.

Figure 4 reports the location of military garrisons during the Ming dynasty. The density of garrisons is far higher along the Sino-nomadic frontier (Bai & Kung, 2011). The coast as well as strategic trade routes towards Central Asia and India was also heavily fortified (Figure 4). At the time, the Chinese government was more likely to award more autonomous resources and better officials to counties close to military sites. Using the location of garrisons during the Ming dynasty as our IV strategy, they can, therefore, be considered as orthogonal to proximity to counties, conditional to fixed effects and controls.

[7] The source of location of military garrisons during the Ming dynasty is obtained from http://worldmap.harvard.edu/data/geonode:Ming_Garrisons

Figure 4. The location of garrisons in the Ming dynasty



The relevance of our chosen instrument is confirmed by the first stage analysis results (Table 4). We begin by regressing in column (1) the military presence during the Ming dynasty — proxied by the number of garrisons in a county— on pre-modern government quality, including only prefecture-level fixed effects as controls. The coefficient is positive (0.349) and highly significant. The inclusion of geographic and historical and contemporary socio-economic controls in columns (2), (3), and (4), respectively, lowers somewhat the dimension of the coefficient, but it remains strongly positive and significant. Hence, the chosen instrument represents a good predictor of local governance quality during the Qing dynasty.

Table 4. The first stage result

VARIABLES	(1)	(2)	(3)	(4)
	Historical governance quality			
Garrison in Ming dynasty	0.349***	0.318***	0.281***	0.220***
	(0.0525)	(0.0473)	(0.0416)	(0.0394)
Land area (logged)		0.470***	0.521***	0.562***
		(0.0658)	(0.0525)	(0.0489)
Longitude		-0.0192	-0.0374	-0.0414
		(0.0338)	(0.0409)	(0.0429)
Latitude		-0.152***	-0.236***	-0.255***
		(0.0494)	(0.0566)	(0.0553)
Slope		-1.010***	-1.032***	-0.494
		(0.367)	(0.343)	(0.348)
Elevation (logged)		-0.127*	-0.120**	-0.116*
		(0.0700)	(0.0602)	(0.0637)
Prefectural capital			0.538***	0.465***
			(0.0889)	(0.0916)
Distance to the coast			-0.0162	0.0891
			(0.0715)	(0.0821)
Distance to the Grand Canal			-0.333***	-0.325***
			(0.0489)	(0.0708)
Distance to Beijing			-0.228**	-0.124*
			(0.103)	(0.0750)
Agricultural yields (logged)			0.119	0.137
			(0.102)	(0.103)
Human capital (logged)				0.383
				(0.408)
Urbanization ratio				0.796**
				(0.331)
Manufacturing ratio				-0.00294
				(0.00377)
Population density				418.8***
				(119.0)
Constant	3***	10.20***	20.83***	17.75***
	(0)	(3.304)	(4.519)	(4.759)
Geographic controls	N	Y	Y	Y
Historical socio-economic controls	N	N	Y	Y
Contemporary socio-economic controls	N	N	N	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	1,665	1,664	1,638	1,456
R-squared	0.374	0.442	0.480	0.520

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3.2 Exclusion restrictions

To further examine the exclusion restrictions of our instrument, we regress the following measures on our instrument: a county's (1) distance to coast, (2) distance to the Grand Canal, (3) slopes, (4) elevation, (5) hosting the prefectural capital or not, (6) agricultural yields, (7) current levels of human capital, (8) urbanisation, and (9) manufacturing ratio. The results of the regression are reported in columns (1) to (9) of Appendix Table A2. None of these potentially confounding covariates is significantly correlated with the location of garrisons during the Ming era. Thus, there is no indication that the instrument may work through channels other than historical governance quality.

4.4 Instrumented results

We now report the 2SLS estimates in Table 5. The F-statistics suggest that our instrument is strong. The F-statistic remains over 30, even after including a rich gamut of covariates (Column (4)). More importantly, the IV estimates are also highly significant. Specifically, column (1) shows that historical governance quality itself has a significant impact on local economic outcomes. Adding the geographic controls in column (2) further increases the magnitude of the coefficient. In columns (3) and (4), the causal relationship between historical governance quality and levels of development in 2010 remains, even after introducing both historical and current socio-economic controls. Interestingly, the dimension of the instrumented coefficient (0.404, column (4) of Table 5) is much larger than the equivalent OLS estimate (0.110, column (4) of Table 2), which suggests that the OLS analysis may understate the influence of historical governance quality on present-day development. Overall, the 2SLS results demonstrate that differences in historical governance quality across counties in China influence, to a considerable extent, current differences in wealth.

Table 5. Historical governance quality on county night light luminosity in 2010: 2SLS estimate, overall

VARIABLES	(1)	(2)	(3)	(4)
	Night light luminosity in 2010			
Historical government quality	0.644***	0.627***	0.725***	0.404***
	(0.0661)	(0.0852)	(0.0921)	(0.103)
Land area (logged)		-0.525***	-0.596***	-0.398***
		(0.0758)	(0.0685)	(0.0713)
Longitude		0.0858*	0.102**	0.0203
		(0.0519)	(0.0486)	(0.0377)
Latitude		0.149***	0.199***	0.149***
		(0.0576)	(0.0633)	(0.0560)
Slope		-1.665***	-1.772***	-1.597***
		(0.335)	(0.342)	(0.281)
Elevation (logged)		-0.0453	0.0343	-0.0423
		(0.0463)	(0.0515)	(0.0445)
Prefectural capital			-0.195*	-0.112
			(0.0997)	(0.0796)
Distance to the coast			-0.202***	-0.127***
			(0.0660)	(0.0449)
Distance to the Grand Canal			0.130**	0.106*
			(0.0613)	(0.0581)
Distance to Beijing			-0.0303	0.0497
			(0.0468)	(0.0452)
Agricultural yields (logged)			0.0362	0.149
			(0.160)	(0.103)
Human capital (logged)				1.880***
				(0.279)
Urbanization ratio				0.942***
				(0.230)
Manufacturing ratio				0.0164***
				(0.00290)
Population density				13.92
				(89.66)
Constant	-0.868***	-13.56***	-16.52***	-11.92***
	(0.198)	(4.897)	(4.972)	(3.940)
Geographic controls	N	Y	Y	Y
Historical socio-economic controls	N	N	Y	Y
Contemporary socio-economic controls	N	N	N	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	1,664	1,664	1,638	1,456
R-squared	0.665	0.759	0.728	0.831
First stage F	44.363	45.095	45.435	31.117

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.5 Robustness checks

To test the validity and strength of the above results we conduct several robustness checks. First, to further reduce the concern that our results may be biased by the political, economic, and social conditions, we collect additional information regarding these key criteria for location selection and additional variables. These include population data for 1600 (the only population data available at the county level before 1730), data regarding the number of natural disasters, the security situation, and local taxation before the government of the *Chongfanpinan* system. Table 6 shows that the results fundamentally remain unchanged even after the introduction of additional controls.

We then assess whether the inclusion of some minority regions in the analysis affects the coefficients. In fact, most of China's ethnic minorities lived near military fortresses. Based on our above-mentioned distribution principle of government quality, ethnic minority areas are more likely to have been allocated more and better government resources. Therefore, there might be a concern that our results will be affected by the ethnic minority areas. However, excluding ethnic minority areas, for most of Han China, the influence of the political system on the economy may be ineffective. Moreover, because of their different culture and norms, especially in historical times, the inclusion of minority regions may affect both the measurement of historical institutional quality under the *Chongfanpinan* reform and its link to current levels of GDP per capita (Bai & Kung, 2011). Hence, in Table 7, we re-run the analysis including only those counties in Han China and without considering minority regions, such as Xinjiang and Gansu. The results indicate that the connection between governance quality during the Qing dynasty and night light luminosity at the county level in 2010 is robust to the exclusion of minority regions.

Table 6. OLS and 2SLS analysis, controlling more historical variables.

VARIABLES	(1)	(2)	(3)	(4)
	Night light luminosity in 2010			
	OLS	OLS	OLS	2SLS
Historical government quality	0.194***	0.191***	0.0932***	0.264***
	(0.0237)	(0.0248)	(0.0260)	(0.0965)
Crime (logged)	0.0812	0.0568	-0.0565	-0.0424
	(0.0972)	(0.0993)	(0.0950)	(0.0886)
Disaster (logged)	-0.00533	0.0259	-0.0276	-0.0424
	(0.0637)	(0.0621)	(0.0517)	(0.0480)
Tax (logged)	0.0655	0.0731	0.0535	0.0434
	(0.0544)	(0.0555)	(0.0501)	(0.0436)
Historical population (logged)	0.145***	0.136***	0.0739*	0.0399
	(0.0484)	(0.0477)	(0.0379)	(0.0379)
Land area (logged)	-0.396***	-0.399***	-0.254***	-0.341***
	(0.0507)	(0.0523)	(0.0513)	(0.0672)
Longitude	0.0517	0.0182	-0.0266	-0.0124
	(0.0486)	(0.0479)	(0.0436)	(0.0392)
Latitude	0.0728	0.106	0.0909	0.128**
	(0.0715)	(0.0746)	(0.0680)	(0.0615)
Slope	-1.780***	-1.824***	-1.372***	-1.313***
	(0.353)	(0.357)	(0.316)	(0.292)
Elevation (logged)	-0.0531	-0.0109	-0.0717	-0.0555
	(0.0526)	(0.0522)	(0.0515)	(0.0445)
Prefectural capital		-0.0150	-0.0115	-0.117
		(0.0761)	(0.0706)	(0.0902)
Distance to the coast		-0.219***	-0.0984**	-0.106**
		(0.0638)	(0.0464)	(0.0449)
Distance to the Grand Canal		-0.00781	0.0147	0.0633
		(0.0429)	(0.0403)	(0.0519)
Distance to Beijing		-0.122**	0.0530	0.0741
		(0.0538)	(0.0528)	(0.0490)
Agricultural yields (logged)		-0.0329	0.0654	0.0712
		(0.139)	(0.142)	(0.133)
Human capital (logged)			1.828***	1.705***
			(0.317)	(0.277)
Urbanization ratio			1.282***	1.134***
			(0.231)	(0.205)
Manufacturing ratio			0.0153***	0.0160***
			(0.00287)	(0.00267)
Population density			137.5	73.74
			(113.5)	(99.11)
Constant	-7.919*	-0.677	-3.496	-6.867
	(4.265)	(4.415)	(4.050)	(4.222)
Additional controls	Y	Y	Y	Y
Geographic controls	Y	Y	Y	Y
Historical socio-economic controls	N	Y	Y	Y
Contemporary socio-economic controls	N	N	Y	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	1,396	1,395	1,234	1,234
R-squared	0.811	0.815	0.862	0.853
First stage F				34.39

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses

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

Table 7. OLS and 2SLS analysis excluding minority regions.

VARIABLES	(1)	(2)	(3)	(4)
	Night light luminosity in 2010			
	OLS	OLS	OLS	2SLS
Historical government quality	0.234***	0.222***	0.127***	0.378***
	(0.0217)	(0.0224)	(0.0228)	(0.0907)
Land area (logged)	-0.304***	-0.303***	-0.288***	-0.428***
	(0.0487)	(0.0496)	(0.0442)	(0.0639)
Longitude	0.140***	0.114**	-0.00712	0.0189
	(0.0504)	(0.0549)	(0.0379)	(0.0360)
Latitude	0.0432	0.0526	0.106*	0.164***
	(0.0591)	(0.0617)	(0.0568)	(0.0540)
Slope	-2.371***	-2.412***	-1.515***	-1.418***
	(0.317)	(0.317)	(0.250)	(0.244)
Elevation (logged)	-0.0525	-0.0184	-0.0828*	-0.0297
	(0.0546)	(0.0494)	(0.0438)	(0.0427)
Prefectural capital		0.0632	-0.0345	-0.183**
		(0.0811)	(0.0681)	(0.0863)
Distance to the coast		-0.189***	-0.111**	-0.125**
		(0.0608)	(0.0475)	(0.0520)
Distance to the Grand Canal		-0.0476	0.00664	0.0953
		(0.0458)	(0.0506)	(0.0624)
Distance to Beijing		-0.169***	-0.00397	0.0563
		(0.0437)	(0.0387)	(0.0460)
Agricultural yields (logged)			0.121*	0.0838
			(0.0632)	(0.0549)
Human capital (logged)			1.923***	1.653***
			(0.433)	(0.409)
Urbanization ratio			-0.00637	0.0145
			(0.132)	(0.113)
Manufacturing ratio			0.302**	0.235**
			(0.129)	(0.110)
Population density			0.0137***	0.0132***
			(0.00281)	(0.00256)
Constant	-15.33***	-7.682	-7.639**	-13.56***
	(4.616)	(5.185)	(3.851)	(4.019)
Geographic controls	Y	Y	Y	Y
Historical socio-economic controls	N	Y	Y	Y
Contemporary socio-economic controls	N	N	Y	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	1,572	1,572	1,393	1,393
R-squared	0.810	0.814	0.863	0.842
First stage F				42.449

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Furthermore, to show that our results are not affected by economic outcomes in a single year, in the Appendix Figure A3 and Figure A4, we repeat the analysis by replacing the luminosity

in the other years from 1992 to 2012. Both OLS and 2SLS results are not affected by individual years. We also conduct the regression using province fixed effects, rather than prefectural-level ones. The results remain similar.

5. Understanding the mechanism

Having established a causal relationship between historical local governance institutions and contemporary local development, we now endeavour to dismantle the mechanism. We lay out two hypotheses. The first concerns '*the role of political decentralisation*': current variations in development across China may be driven by the long-term decentralisation triggered by historical institution. The second hypothesis is '*good governance led by qualified officials*': the *Chongfanpinan* institution positively affected economic outcomes at county level via the higher performance of the officials allocated to counties with a higher score. In the following sections, we present evidence for or against each hypothesis.

5.1 Decentralisation

The effect of decentralisation has long been controversial. Although increasing evidence shows that decentralisation could boost economic prosperity, both at subnational and national level, several works suggest, on the contrary, that it may also undermine overall economic performance (Bo, 2020; Dell, 2010; Rodríguez-Pose & Ezcurra, 2011). Studying historical institutions provides us with an ideal setting to further test the effects of decentralisation.

Based on the principle of the local governance institution in the Qing dynasty, counties that were above tier 2 had the autonomy to appoint local officials. The appointment of local officials in these counties was partially a prerogative of provincial governors.[8] Conversely, local officials in counties below tier 2 in the political hierarchy were fully chosen by the Ministry of personnel of central administration. To examine the first hypothesis, the key independent variable, decentralisation, is a dummy equal to 1, where provincial governors have the right to appoint and remove officials in the local, and 0 otherwise. The other key independent variable, centralisation, is a dummy equal to 1, where local officials are appointed by the central government directly, and 0 otherwise. As before, our dependent variable is luminosity in 2010.

[8] Provincial governors still needed to have a discussion with central administration.

Table 8. Decentralization or centralization

VARIABLES	(1)	(2)	(3)	(4)
	Night light luminosity in 2010			
	OLS	2SLS	OLS	2SLS
Decentralization	0.163***	0.9529***		
	(0.0590)	(0.2051)		
Centralization			0.173	-1.1642***
			(0.113)	(0.3173)
Land area (logged)	-0.212***	-0.3121***	-0.176**	-0.2997***
	(0.0717)	(0.0807)	(0.0702)	(0.1092)
Longitude	-0.0497***	-0.0450***	-0.0510***	-0.0492***
	(0.00942)	(0.0103)	(0.00939)	(0.0101)
Latitude	0.0395***	0.0396***	0.0405***	0.0327***
	(0.00920)	(0.0105)	(0.00881)	(0.0119)
Slope	-0.909***	-0.8416***	-0.954***	-0.7124*
	(0.308)	(0.3094)	(0.292)	(0.4050)
Elevation (logged)	-0.0709*	-0.0412	-0.0807**	-0.0524
	(0.0383)	(0.0382)	(0.0390)	(0.0468)
Prefectural capital	0.0493	-0.1728*	0.129	-0.1304
	(0.0713)	(0.0962)	(0.0802)	(0.1068)
Distance to the coast	-0.228***	-0.2284***	-0.230***	-0.2158***
	(0.0396)	(0.0444)	(0.0370)	(0.0550)
Distance to the Grand Canal	-0.151***	-0.1383***	-0.148***	-0.1908***
	(0.0316)	(0.0352)	(0.0283)	(0.0460)
Distance to Beijing	-0.0672	-0.0547	-0.0648	-0.1036
	(0.0490)	(0.0526)	(0.0453)	(0.0686)
Agricultural yields (logged)	0.348***	0.3328***	0.341***	0.4168***
	(0.0837)	(0.0809)	(0.0818)	(0.1091)
Human capital (logged)	1.609***	1.3304***	1.679***	1.5860***
	(0.321)	(0.3504)	(0.324)	(0.3877)
Urbanization ratio	1.490***	1.4919***	1.552***	1.0714**
	(0.400)	(0.3897)	(0.408)	(0.5422)
Manufacturing ratio	0.00920**	0.0079*	0.00903**	0.0124***
	(0.00377)	(0.0041)	(0.00365)	(0.0047)
Population density	578.1***	410.3851***	641.5***	421.0634***
	(140.8)	(130.6963)	(151.4)	(139.9461)
Constant	4.425***	3.8472**	4.379***	5.6608***
	(1.569)	(1.6351)	(1.581)	(1.8198)
Geographic controls	Y	Y	Y	Y
Historical socio-economic controls	Y	Y	Y	Y
Contemporary socio-economic controls	Y	Y	Y	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	1,580	1,580	1,580	1,580
R-squared	0.640	0.5873	0.641	0.4405
First stage F		55.1		40.4

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results are reported in Table 8. Column (1) includes the OLS results with all sets of controls, which shows that decentralisation is both positively and significantly associated with economic development today. The OLS result is further confirmed by the 2SLS estimate shown in column (2). In fact, the magnitude of the coefficient corrected by the instrument is over five times larger than the original estimate. Column (3) and (4) illustrate the effect of centralisation on current development. Interestingly, the instrumented result shows that centralisation does significantly lead to lower levels of development. In sum, we find that, compared with centralised counties, the autonomous counties in historical times currently enjoy higher levels of development.

5.2 Good governance

Good governance is regarded as one of the key indicators of institutions (Besley & Persson, 2011; Rodríguez-Pose & Storper, 2006). However, although research has found that good governance is a fundamental driver of development in developed countries, there is less evidence confirming this is also the case for authoritarian regimes in historical times. Here we measure good governance through the qualifications of local officials. The hypothesis is that counties continuously governed by more highly qualified officials create a good governance ecosystem. Consequently, these counties with better historical governance would have ended up more developed today.

To quantify the official's qualifications and the extent of good governance, we draw on the China Government Employee Database (*Jinshenlu*) (CGED), provided by Campbell et al. (2019). CGED introduces the comprehensive information about 638,153 local officials in the Qing dynasty.[9] We use the local official's scores in the civil service examination *(Keju)* as the key proxy for their qualifications. The result of the civil service examination is a good indicator because the main purpose and content of this examination were to train and select suitable imperial officials (Bai & Jia, 2016). According to this line of reasoning, we can assume that more highly qualified officials would be those with higher scores. We follow the classification of the civil service examination: (1) officials with the lowest scores are classified as 1; (2) those that pass the licensing exam at the prefectural level (*Yuankao*) as 2; (3) those that pass the qualifying exam at the provincial level (*Xiangshi*) as 3; and (4) those that pass the academy

[9] The current time span of CGED is from 1900 to 1912.

exam at the national level (*Huikao*) as 4. The specific structure of the civil service exam is shown in Appendix A. To match other variables, we then aggregate the results of the civil service examination for the officials working in any given county at county level.

We first report the interaction between local governance and the qualification of local officials in Column (1) and (2) of Table 9. Unsurprisingly, our result confirms that more qualified officials were highly likely to be appointed to counties deemed to be of greater strategic importance. This result is highly statistically significant. Columns (3) and (4) report the effect of good governance. The interaction of the scores of local civil servants with historical government quality is positive and significant (column (3)), suggesting that in places with high government quality, good governance is at the root of a higher level of GDP per capita. The 2SLS estimates of column (4) also support this view. Overall, the results confirm the intuition that historically persistent good governance in historical times is an important driver of current differences in development across China.

Table 9. The effect of good governance

	(1)	(2)	(3)	(4)
VARIABLES	Official		Night light luminosity in 2010	
	OLS	2SLS	OLS	2SLS
Historical government quality	0.0924***	0.3820***	-0.0694	-0.0683
	(0.0210)	(0.1219)	(0.0829)	(0.2757)
Good governance			-0.156**	-0.3311**
			(0.0736)	(0.1409)
Historical government quality*good governance			0.0638**	0.1373**
			(0.0310)	(0.0687)
Land area (logged)	-0.0439	-0.1984**	-0.314***	-0.4330***
	(0.0319)	(0.0776)	(0.0476)	(0.0808)
Longitude	0.00418	0.0024	-0.0507***	-0.0539***
	(0.00694)	(0.0074)	(0.0110)	(0.0106)
Latitude	-0.0136**	-0.0155**	0.0384***	0.0378***
	(0.00659)	(0.0074)	(0.0102)	(0.0109)
Slope	0.0341	0.1528	-1.552***	-1.3461***
	(0.175)	(0.2114)	(0.253)	(0.2532)
Elevation (logged)	-0.0215	-0.0110	0.0150	0.0252
	(0.0235)	(0.0285)	(0.0291)	(0.0284)
Prefectural capital	-	-	-	-
Distance to the coast	0.0251	0.0225	-0.287***	-0.3052***
	(0.0243)	(0.0266)	(0.0355)	(0.0417)
Distance to the Grand Canal	-0.0200	-0.0148	-0.148***	-0.1361***
	(0.0239)	(0.0264)	(0.0276)	(0.0296)
Distance to Beijing	0.0203	0.0109	-0.0631	-0.0735
	(0.0322)	(0.0412)	(0.0428)	(0.0479)
Agricultural yields (logged)	-0.0231	-0.0078	0.184***	0.2229***
	(0.0596)	(0.0620)	(0.0699)	(0.0841)
Human capital (logged)	0.414	0.3420	1.444***	1.4069***
	(0.269)	(0.2974)	(0.321)	(0.3226)
Urbanization ratio	0.0242	-0.1546	1.741***	1.4308***
	(0.214)	(0.2570)	(0.267)	(0.2894)
Manufacturing ratio	0.00183	0.0021	0.00574	0.0056
	(0.00246)	(0.0025)	(0.00380)	(0.0039)
Population density	-51.58	-202.6159**	412.6***	270.5656**
	(44.69)	(84.4557)	(129.3)	(115.2557)
Constant	1.392	0.9892	6.771***	7.1966***
	(1.262)	(1.4649)	(1.673)	(1.7511)
Geographic controls	Y	Y	Y	Y
Historical socio-economic controls	Y	Y	Y	Y
Contemporary socio-economic controls	Y	Y	Y	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	1,154	1,154	1,154	1,152
R-squared	0.045	-0.1003	0.722	0.6864
First stage F		44.9		9.05

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6. The effect of Western shocks

How does the influence of local governance quality during the Qing era on present-day territorial disparities in China compare with that of the institutional changes introduced during the 19th century as a consequence of the expansion of the influence of Western powers in the country? The waxing Western influence after the First Opium Wars in the 1840s has traditionally been considered by historians as a fundamental factor behind the pervasiveness of regional inequality in China (Cameron, 1933; Jia, 2014; Long et al., 2019). However, the evidence about the extent to which the shocks linked to the intervention by Western powers affected local economic growth in China remains scarce. To examine whether the shocks of Western intervention had a similar or greater effect than that of pre-existing Qing era differences in local governance quality on the distribution of wealth in China, we select two representative elements of Western intervention in China: protestant missionary activities and treaty ports. This type of interventions grew during the 19th century and are considered to have deeply shaped modern China (Jia, 2014; Long et al., 2019). We use protestant missionary activities as a proxy for Western cultural intervention in Chinese society, while the establishment of treaty ports represents the more political and economic dimension of the intervention.

Figure 5. Protestant missionary presence

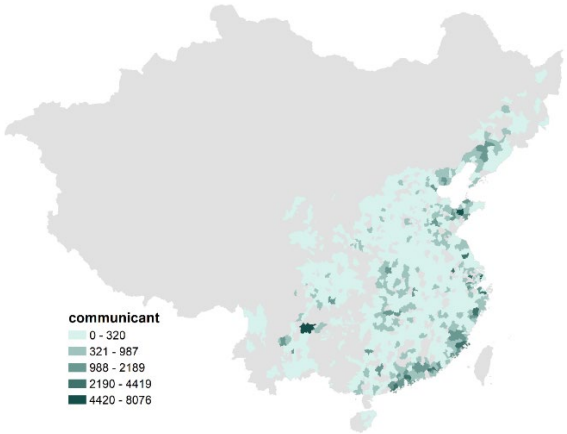
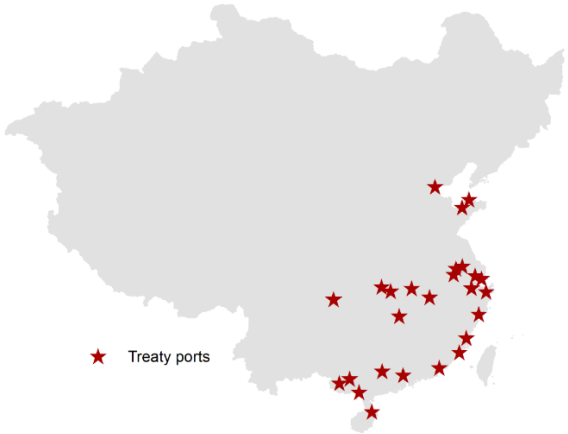


Figure 6. Treaty ports



Protestant missions in China started in the early 19th century, but their presence grew exponentially towards the end of the century. According to Stauffer (1922), by the beginning of the 20th century protestant missionaries were present in over 94% of counties in China proper and Manchuria (Figure 5). Research has shown that, in China, Protestantism had a significant causal effect on economic prosperity as measured by urbanization in 1920 and industrialisation between 1841 and 1915 (Bai & Kung, 2015). Treaty ports were port cities established after the First Opium War and the ensuing Treaty of Nanking of 1842 granting Britain, first, and —following a number of other 'unequal' treaties— other Western powers, free access to trade with China through these cities. By the end of the 19th century close to 80 free ports had been set up in China, most on the Eastern seaboard and along the Yang-Tze and Pearl rivers (Figure 6). The Western countries that managed the treaty ports established municipal authorities, police, and separate judicial systems.

To what extent has the sprawling Western influence over China in the 19th century left a legacy on economic development differences when compared to the earlier local differences in government quality? Did the shocks associated with Western intervention erase the influence of pre-established institutions? We test whether that is the case by regressing the effect of these shocks alongside differences in Qing era local governance quality following the same logic as in model (1). We conduct both OLS and 2SLS regressions.

The results of Table 10 clearly show that differences in historical local governance quality in China survived the disruption of the 19th and early 20th century Western shocks. Differences in governance quality associated with the *Chongfanpinan* reform have left more of a trace on current levels of development in China than the cultural and institutional influence of Protestant missionaries. The coefficient for historical governance quality is significant in columns (1) and (2), while that denoting the presence of Protestant missionaries in a county is insignificant. The coefficient of the interaction term between both variables is also insignificant. This implies that the activities of protestant missionaries did not weaken the long-term impact of deeply seated governance differences across China.

Table 10. The effect of Western shocks on contemporary economic development

VARIABLES	(1)	(2)	(3)	(4)
	Night light luminosity in 2010			
	OLS	2SLS	OLS	2SLS
Historical government quality	0.121***	0.3236***	0.123***	0.4689***
	(0.0275)	(0.0999)	(0.0244)	(0.1180)
Missionary presence	9.43e-05	0.0001		
	(7.88e-05)	(0.0001)		
Historical government quality*Missionary presence	-4.73e-06	-0.0000		
	(2.79e-05)	(0.0001)		
Treaty ports			-0.311	0.1939
			(0.300)	(0.3448)
Historical government quality* Treaty ports			-0.0949*	-0.3095***
			(0.0557)	(0.1043)
Land area (logged)	-0.247***	-0.3826***	-0.224***	-0.4134***
	(0.0523)	(0.0822)	(0.0438)	(0.0748)
Longitude	0.0550	0.0449	0.00531	0.0130
	(0.0389)	(0.0375)	(0.0396)	(0.0372)
Latitude	-0.00382	0.0628	0.0720	0.1483***
	(0.0489)	(0.0527)	(0.0538)	(0.0550)
Slope	-1.456***	-1.2193***	-1.747***	-1.5361***
	(0.361)	(0.3382)	(0.286)	(0.2830)
Elevation (logged)	-0.0872	-0.0734	-0.0790*	-0.0491
	(0.0533)	(0.0458)	(0.0475)	(0.0444)
Prefectural capital	0.0909	-0.0178	0.0193	-0.1623*
	(0.101)	(0.1077)	(0.0637)	(0.0886)
Distance to the coast	-0.0733**	-0.0975**	-0.0985**	-0.1440***
	(0.0359)	(0.0385)	(0.0413)	(0.0462)
Distance to the Grand Canal	0.0125	0.0754	0.00930	0.1225**
	(0.0399)	(0.0525)	(0.0390)	(0.0613)
Distance to Beijing	-0.00932	0.0181	0.0249	0.0600
	(0.0420)	(0.0419)	(0.0460)	(0.0462)
Agricultural yields (logged)	0.257	0.3620*	0.187	0.1513
	(0.244)	(0.1910)	(0.119)	(0.1062)
Human capital (logged)	2.038***	1.8113***	2.054***	1.8458***
	(0.306)	(0.2735)	(0.305)	(0.2836)
Urbanization ratio	0.927***	0.7719***	1.228***	0.9897***
	(0.239)	(0.2145)	(0.239)	(0.2352)
Manufacturing ratio	0.0155***	0.0158***	0.0156***	0.0166***
	(0.00339)	(0.0031)	(0.00298)	(0.0029)
Population density	98.30	37.3901	159.9	37.5564
	(92.09)	(75.7029)	(114.7)	(92.6930)
Constant	-9.344***	-12.4332***	-6.661*	-11.4157***
	(3.270)	(3.6019)	(3.627)	(3.8430)
Geographic controls	Y	Y	Y	Y
Historical socio-economic controls	Y	Y	Y	Y
Contemporary socio-economic controls	Y	Y	Y	Y
Prefecture Fixed Effects	Y	Y	Y	Y
Observations	986	986	1,456	1,456
R-squared	0.884	0.8704	0.858	0.8245
First stage F		8.17		13.5

Robust standard errors adjusted for clustering at the prefecture level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Treaty ports left more of a trace. As seen in columns (3) and (4) of Table 10, the coefficients for both historical governance quality and the establishment of a treaty port are both positive and significant. Better governed counties in historical times and counties that contained a treaty port are —once other factors are also taken into consideration— significantly richer today than areas of the country with weaker governance records and that did not contain a port. The negative and significant interaction term between both variables signals that the presence of a treaty port meaningfully weakened the influence of historical Chinese governance institutions over subsequent economic development.

7. Conclusion

In this paper, we have analysed the extent to which historical differences in government quality developed close to four centuries ago have survived the political, economic, and cultural shocks that followed the demise of two millennia of imperial China and still affect differences in county development across China today. Few studies to date have examined the inertia of imperial institutions in a country that, by all accounts, has had what can be considered a turbulent last century.

Our results show that variations in historical local government quality developed during the Qing dynasty still determine, to a considerable extent, differences in economic performance today.[10] They demonstrate that the shadow of history in China is very long and that not even the traumatic events linked to the collapse of Imperial China and the wars and changes in political and economic regimes that ensued have managed to do away with institutions that were developed and became deeply rooted in China over centuries. Our results emphasise the consequential impact of governance reforms of local institutions on economic development, even centuries after the reforms took place and the practices behind them are abandoned. While this point has been overlooked in much of recent development economics, it shows the remaining influence of historical institutional reforms in current levels of development

[10] Please note that in this study, due to data limitations on cronyism in the process of appointments and dismissals, we are only able to quantify the long-term economic impact of shocking events of institutions linked to government. We, unfortunately, have no information on the process of the informal selection of officials. Future research should be able to explore the short-term effects after the shocking event and the economic impact of nepotism, if data and context allow.

(Duranton et al., 2009). Differences in the quality of local government created by historical reforms still matter today and continue to play a significant, if uneven, role in China's development process (Ang, 2016).

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Appendix A

Figure A1. The political hierarchy of the Qing dynasty

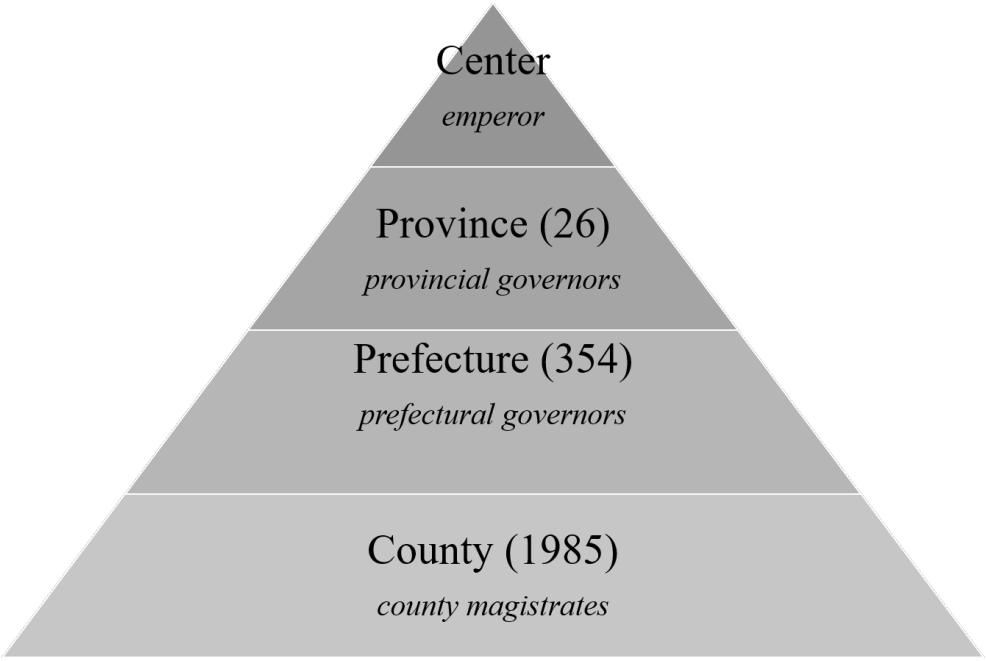


Figure A2. The example of digitalising the local governance institution

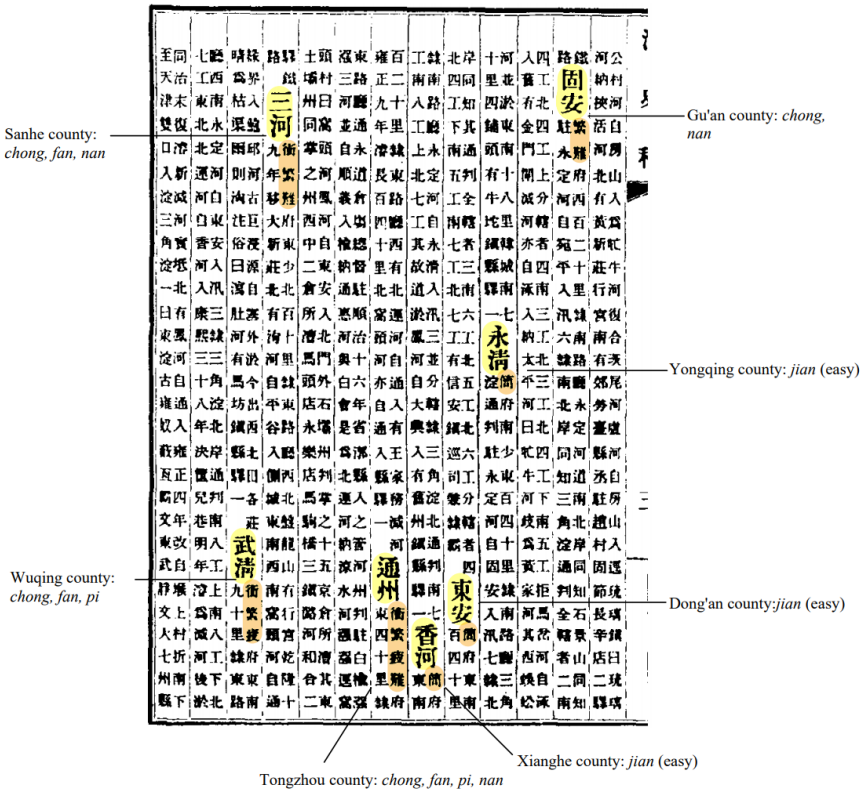


Figure A3. The effect of the per-modern local governance institution over time (OLS results)

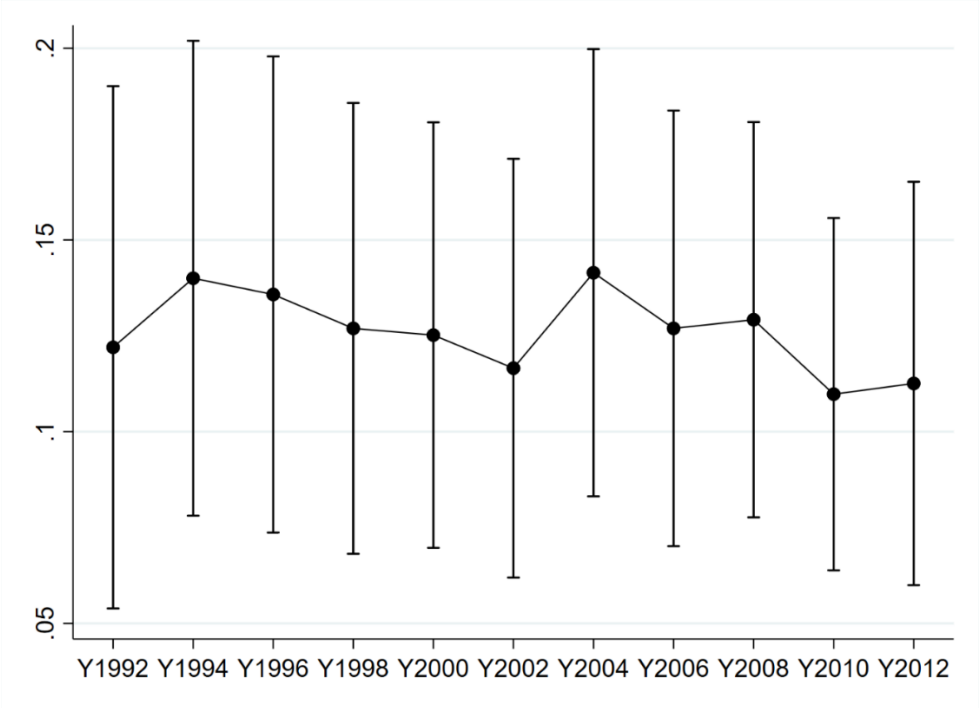


Figure A4. The effect of the per-modern local governance institution over time (2SLS results)

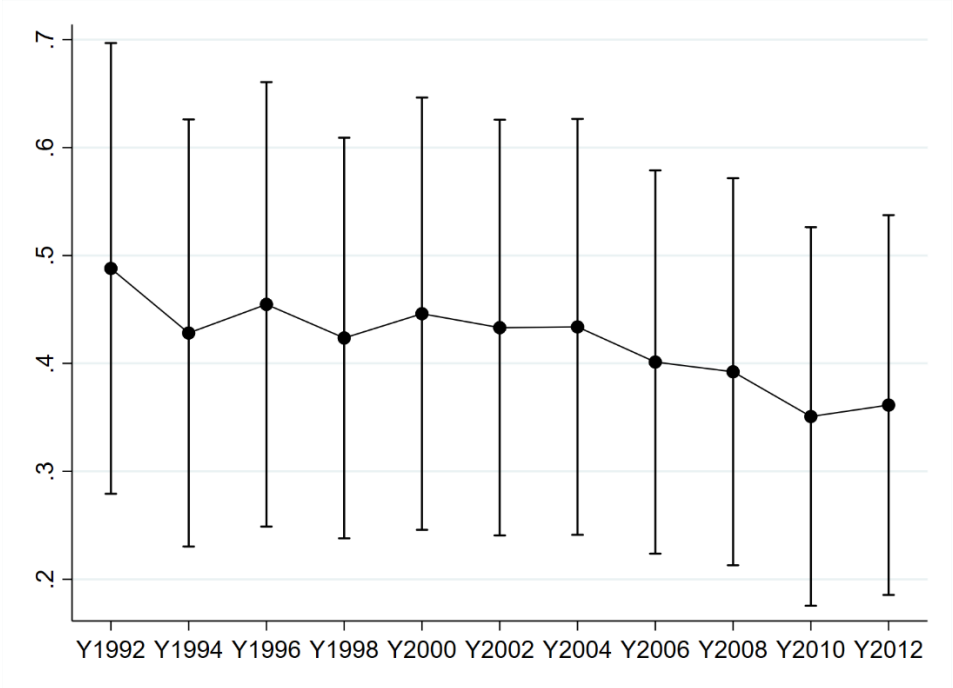


Table A1. Sources and definition

Variable	Definition	Sources	Obs	Mean	S.D
	(a) economic development				
nightlight	nightlight	1	1,969	7.463	10.087
lnnightlight	log nightlight	1	1,909	1.079	1.814
lnnightlight001	log (nightlight+0.01)	1	1,969	0.947	1.930
	(b) *Chongfanpinan* institution				
local government quality	Government quality	2	1,665	1.993	0.931
	(c) geographic control				
longitude	longitude	3	1,985	110.935	8.163
latitude	latitude	3	1,985	33.034	6.981
land area	log of area	3	1,985	-1.547	1.177
slope	slope	3	1,969	0.212	0.187
elevation	log of elevation	3	1,969	5.749	1.670
	(d) historical socio-economic control				
prefecture capital	prefectural capital in Qing dynasty	3	1,985	0.057	0.232
distance to coast	log of distance to coast	3	1,985	12.777	1.305
distance to canal	log of distance to canal	3	1,985	13.164	1.225
distance to capital	log of distance to national capital	3	1,985	13.712	0.945
agricultural yields	log of agricultural suitability	4	1,859	8.013	0.845
	(e) contemporary socio-economic control				
human capital	log of schooling year	5	1,679	2.112	0.148
manufacturing ratio	employment ratio in manufacturing	5	1,840	17.772	12.627
urbanization ratio	urbanization ratio	5	1,840	0.378	0.143
population density	population density	5	1,840	0.000	0.001
	(f) instrument				
garrison	# of garrisons in Ming dynasty	6	1,985	0.182	0.629
	(g) mechanism				
official	local official's education background	7	1,323	2.621	0.614
	(h) western shock				
missionary	# of communicants	8	1,137	266.601	576.897
treaty port	treaty port dummy	9	1,977	0.110	0.313

Data sources:

1: Defense meteorological satellite program's operational linescan system

2: Veritable Records of the Qing Emperors *(Qingshilu)*

3: Harvard Yenching Institution (2007), CHGIS, Version 4

4: Galor & Ozak (2016), The caloric suitability indices

5: Population census by county in 2010

6: Szonyi & Michael, Ming Garrisons (1363-1644)

7: Campbell et al (2019), China Government Employee Database in Qing dynasty *(Jinshenlu)*

8: Stauffer, Milton T. (1922). *The Christian Occupation of China: A General Survey of the Numerical Strength and Geographical Distribution of the Christian Forces in China.* China Continuation Committee, Shanghai

9: Jia, R. (2014). The legacies of forced freedom: China's treaty ports. *Review of Economics and Statistics*, *96*(4), 596-608.

Table A2. Exclusion restrictions

	(1) lncoast	(2) lncanal	(3) slope	(4) lnelevation	(5) capital	(6) lnagriculture	(7) lnschoolyear	(8) urbanization ratio	(9) manufacturing ratio
garrisons in Ming dynasty	-0.0555	-0.0151	-0.00643	0.0744	0.0166	-0.0140	0.00438	0.00854	-0.441
	(0.0370)	(0.0410)	(0.00445)	(0.0453)	(0.0109)	(0.0669)	(0.00390)	(0.00588)	(0.431)
constant	16.39***	20.18***	0.641***	-1.372	-0.119	2.496**	1.716***	-1.150***	48.84***
	(1.972)	(3.194)	(0.217)	(2.143)	(0.308)	(1.133)	(0.142)	(0.194)	(18.52)
Geographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Historical economic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Contemporary economic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,667	1,667	1,667	1,667	1,667	1,582	1,582	1,582	1,582
R-squared	0.605	0.407	0.575	0.716	0.028	0.330	0.454	0.606	0.548

Robust standard errors adjusted for clustering at the province level are given in parentheses

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

Table A3. OLS and 2SLS analysis with province fixed effect

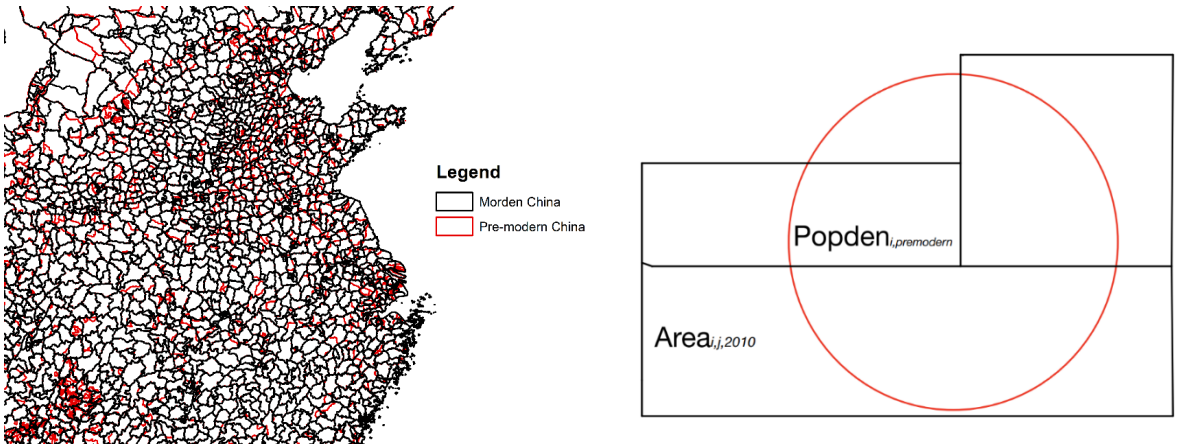
VARIABLES	(1)	(2)	(3)	(4)
	Night light luminosity in 2010			
Historical government quality	0.247***	0.227***	0.0840***	0.511***
	(0.0282)	(0.0351)	(0.0248)	(0.145)
Land area (logged)	-0.484***	-0.455***	-0.236***	-0.447***
	(0.0660)	(0.0679)	(0.0417)	(0.0752)
Longitude	0.0409	-0.00534	-0.0465	-0.0348
	(0.0299)	(0.0335)	(0.0276)	(0.0285)
Latitude	0.0167	0.0150	0.0138	0.0353
	(0.0360)	(0.0415)	(0.0272)	(0.0323)
Slope	-1.961***	-2.272***	-1.617***	-1.505***
	(0.335)	(0.309)	(0.334)	(0.289)
Elevation (logged)	-0.0920	-0.000519	-0.0433	-0.00230
	(0.0623)	(0.0631)	(0.0478)	(0.0438)
Prefectural capital		-0.0466	-0.0258	-0.206**
		(0.0632)	(0.0558)	(0.0850)
Distance to the coast		-0.249***	-0.169***	-0.170***
		(0.0411)	(0.0353)	(0.0326)
Distance to the Grand Canal		-0.0734*	-0.0417	0.0296
		(0.0387)	(0.0326)	(0.0466)
Distance to Beijing		-0.153***	-0.00413	0.00367
		(0.0514)	(0.0369)	(0.0451)
Agricultural yields (logged)		0.0373	0.127*	0.157*
		(0.0923)	(0.0621)	(0.0829)
Human capital (logged)			2.129***	2.025***
			(0.329)	(0.314)
Urbanization ratio			1.135**	0.820**
			(0.421)	(0.400)
Manufacturing ratio			0.0160***	0.0171***
			(0.00372)	(0.00365)
Population density			372.2***	149.9
			(122.6)	(96.99)
Constant	-3.251	7.368**	2.864	-1.443
	(2.562)	(3.001)	(2.004)	(2.358)
Geographic controls	Y	Y	Y	Y
Historical socio-economic controls	N	Y	Y	Y
Contemporary socio-economic controls	N	N	Y	Y
Province Fixed Effects	Y	Y	Y	Y
Observations	1,664	1,638	1,456	1,456
R-squared	0.665	0.675	0.765	0.683
First stage F				42.719

Robust standard errors adjusted for clustering at the province level are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix B

We collect information on socio-economic conditions at county level. The information includes urbanization rate, manufacturing ratio, population density, and average schooling year. The information is extracted from the population census in 2010. As county boundaries in China have changed over last 100 years, we adapt the census data to the historical county boundaries. This allows us to match recent data with historical information from China. The process of data adaptation is illustrated by Figure B1.

Figure B1. The difference of boundary between pre-modern and modern China



Here, the red circle represents county *i* in the Qing dynasty (pre-modern China). County *i* overlaps with county *j* in 2010 (depicted by the rectangle). County *i* is divided into j polygons by the boundaries of county *j*. The area of each polygon is depicted as $Area_{i,j,2010}$. In order to transform the data, we first calculate the 2010 indicators —population density, urbanization ratio, manufacturing ratio, and human capital (j=1,2,…)— for each rectangle of county *j*, using the 2010 boundaries. We assume that each of these indicators are evenly distributed in each rectangle. We then calculate the population in each small polygon as $Area_{i,j,2010} \times popden_{j,2010}$. This calculation facilitates estimating the population density of each county *i* in historical times, using the following formula:

$$popden_{i,pre-modern\ China} = \frac{\sum_{j=1}^{j} Area_{i,j,2010} \times popden_{j,2010}}{Area_i}$$