Property Rights, Fiscal Capacity, and Social Capacity: The Lasting Impact of the Taiping Rebellion

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Abstract. We examine the impact on regional development of the Taiping Rebellion (1850–1864), one of the deadliest civil wars in human history and a critical juncture in China's path toward modernity. Our analysis shows that some areas under the control of the Taiping regime experienced important institutional changes, including strengthened land property rights, improved local fiscal capacity, and enhanced social capacity. We find that these areas with institutional improvements exhibit better long-term development outcomes, as reflected by greater economic activity, higher fiscal revenue, stronger civic norms, and lower mortality during the Great Famine (1959–1961). The results suggest that violent conflicts can have lasting effects on development by shaping local institutions, and that historical variation in property rights, fiscal capacity, and social capacity could partly explain the large within-country variation in development.

Keywords: Rebellion, war, property rights, fiscal capacity, social capacity, civic engagement
JEL codes: H11, H41, N35, O14, O33, O43

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I. Introduction

How do civil wars affect a country's long-term development? And what are the underlying mechanisms? A burgeoning literature studies the economic legacy of war and conflict (e.g., Blattman and Miguel 2010),[1] but the long-term impacts of civil wars and their underlying mechanisms remain poorly understood. As Blattman and Miguel (2010, p. 42) emphasize, "we have little systematic quantitative data with which to rigorously judge claims about the evolution of institutions during and after civil wars…the social and institutional legacies of conflict are arguably the most important but least understood of all war impacts." Fundamental institutional changes often occur at critical junctures in history, therefore, it is important to examine how wars shape institutional changes during the critical moments (Acemoglu and Robinson 2012; Desierto and Koyama 2025).

We add to the growing literature on civil wars by examining the long-term economic, social, and institutional effects of the Taiping Rebellion (1850–1864) in Qing China, one of the deadliest civil wars in human history and a critical juncture in China's path to modernity. The rebellion led to the establishment of the Taiping Heavenly Kingdom, which controlled a significant portion of southern China for about a decade. According to Ho (1959, p. 238), "In scope, duration, intensity and barbarity…the Taiping Rebellion is deservedly called the largest civil war in world history. In sheer brutality and destruction, it has few peers in the annals of history." To deal with the threat posed by the rebellion, the weak central government had to implement decentralization, granting local leaders unprecedented authority over local militias and public finance. This led to a series of significant changes in China's evolution: it strengthened regional power, thereby placing constraints on the central government (Fairbank 1992); and it also facilitated the formation of new local social organizations, such as charities (Zheng 2009; Rankin 1986, 1990).

It is important to understand the Taiping Rebellion's long-term impacts on development and the underlying mechanisms for three reasons. *First*, China exhibits considerable variation in economic performance between regions (Fang et al. 2023), motivating an investigation into the historical roots. China's inter-city differential in average income is as large as any inter-regional differential in the world. Worldwide, the ratio of GDP per capita between the richest and the poorest regions in 2001 was 18 to 1 (Galor 2005, p. 276). This is comparable to the counterpart ratio in China: in 2010, GDP per capita in Dongguan was 27 times that of Tianshui; and the ratio of Erdos to Yushu was 15 in 2022.[2] Since historically all Chinese regions were at a Malthusian income level, more or less similar, the widespread regional differences in development can be termed the Intra-

[1] See also Collier (1998), Acemoglu et al. (2011), Michalopoulos and Papaioannou (2011), and Dell (2012).
[2] An average (prefecture-level) city has a population of 4–5 million people.

China Divergence. What might be the underlying reasons for the Intra-China Divergence? Culture could be a reason: the influence of Confucian culture varies greatly between regions (Chen, Ma, and Sinclair 2022). What about the role of local institutions? Economists have long been fascinated by historical divergence and its institutional roots, as reflected by studies of the Long Divergence between the Islamic and the Christian worlds (Bisin et al. 2024), the Great Divergence between Europe and China (Pomeranz 2000), the Little Divergence between China and Japan since the middle 19th century (Sng and Moriguchi 2014; Koyama, Moriguchi, and Sng 2018), and the reversal in incomes between Southern American countries and Northern American countries (Acemoglu, Johnson and Robinson 2002). In this paper, we examine how the Taiping Rebellion contributed to the Intra-China Divergence as well as potential mechanisms, using sub-national data over a long period.

Second, the rebellion led to rich regional variation in institutional and social arrangements that are relevant to long-term development. Due to its historical legacy, imperial China exhibited strong state capacity and weak society capacity for two millennia (Zhao 2015; Acemoglu and Robinson 2019; Shirley and Xu 2025). However, within the last millennium, Taiping Rebellion marked a significant turning point in the state-society relationship, as Wang (2022) forcefully argues. It marked a shift from a period of "state maintaining under partnership" since the Song Dynasty (960–1279 CE) to a period of "state weakening under warlordism" starting from the Taiping Rebellion. Under "state maintaining under partnership," the state and the local elites formed a partnership to govern the country: local elites were in charge of providing local public goods while the central politicians connected to local groups tended to block reforms that aimed to strengthen state capacity (but weaken local elites). Regional variation in institutions and social capacity was already large during this partnership era. Under "state weakening under warlordism" since the Taiping Rebellion, the central state lost control, and warlords took over local governance completely. Local social groups increasingly developed private-order institutions to provide security and justice. Variation in local institutions and social capacity became even more dramatic. For example, the protection of land property rights differed greatly across the rebel-controlled areas. On the Qing side, fiscal power was decentralized, causing large differences in regional fiscal capacity. In addition, in some regions, charity organizations sprang up under the leadership of local elites after the rebellion. The Taiping Rebellion and its subsequent changes thus afford us a unique and important opportunity to study how *decentralization*—induced by the Taiping Rebellion in our case—affected regional development.

Third, compared to cross-country studies on the consequences of war, an analysis like ours, which relies on sub-national units in China, has some methodological advantages. Cross-country

studies of war often suffer from data selectivity problems: war-torn countries generally have lower-quality data, and those most severely affected are less likely to be represented, obscuring evidence on the impact of wars in the very areas where wars have taken the greatest toll. In our case, an analysis of sub-national data allows us to compare war-torn areas with other areas within the same country. Moreover, our data spanning one and a half centuries allow us to generate insights concerning the long-term impacts of one of the largest civil wars in history.

Our investigation focuses on several aspects of the rebellion and the Qing government's responses. We formulate several hypotheses, as summarized by Figure 1. *First*, the protection of land property rights was better in the areas that the rebels controlled in the late stage (i.e., around 1860 and later; referred to as "Late Taiping" areas) than in those that the rebels controlled in the early stage ("Early Taiping" areas). We examine whether the Late Taiping areas experienced faster post-war population recovery and better long-term development than the Early Taiping areas (the "property rights hypothesis"). *Second*, to enable local elites to finance their fight against the rebels, the Qing government instituted drastic fiscal decentralization and introduced a new form of tax called *likin*. We examine whether this fiscal decentralization strengthened local fiscal capacity, as measured by *likin* revenue, and whether stronger local fiscal capacity ultimately resulted in improved provision of public goods and better long-term development outcomes (Besley and Persson 2009). We call this the "*likin*-as-fiscal-capacity hypothesis." *Third*, local elites led the fight against the rebels and the post-war reconstruction; thus, some regions experienced more social cooperation and witnessed a rise in elite-led charity organizations. This motivates us to investigate the long-term impacts of the rebellion-induced development of social capacity, which is the society's capacity to get things done collectively by its members, including constraining the government and/or empowering the society. To the extent that social capacity, represented by charity organizations, acts as an important constraint on state power and facilitates social mobilization, it stands to reason that social capacity could promote more balanced and sustainable long-term development (Acemoglu and Robinson 2019). We call this the "social change hypothesis." Meanwhile, the shared cooperation experience during and after the rebellion in select Taiping areas may have fostered lasting social cohesion and civic engagement. We call this the "social cohesion and civic engagement hypothesis."

We examine these hypotheses by analyzing rich prefecture-level (and occasionally county-level) data. Some prefectures were under the control of the Taiping regime during the rebellion (Taiping prefectures), while others were not (control prefectures). We begin by establishing the effects of the rebellion on population growth, property rights, local fiscal capacity, and social capacity. When examining these outcomes, we use a difference-in-differences (DID) approach to

compare the evolution of the outcome (relative to the base period) between Taiping and control prefectures. To address concerns about confounding differential trends between the regions, we supplement the baseline DID approach with several additional estimation strategies. First, to account for pre-rebellion differences, we rely on propensity score matching to select a set of observationally similar prefectures in terms of pre-rebellion characteristics, following the previous literature (Xue 2021). Second, to further address potential omitted variables bias and measurement error, we use an instrumental variable (IV) approach, which leverages plausibly exogenous geographic variation resulting from the Taiping Army's military strategy to predict rebellion experience. Third, we examine the robustness of our key results when allowing for spatial interactions, which might be relevant for research on long-term persistence (Kelly 2019). In addition, we demonstrate that the DID results are not confounded by (i) a range of other historical events, (ii) the influence of the Taiping Army's conquest that did not lead to territorial control, (iii) the spillovers between neighboring units, and (iv) provincial heterogeneity.

We obtain several findings regarding the rebellion's impacts on the evolution of population, local fiscal capacity, and social capacity. *First*, the Taiping Rebellion had a significant impact on patterns of population growth in rebel-controlled areas. The rebellion induced permanent population losses in the Early Taiping areas, but not in the Late Taiping areas that had better land property rights. Moreover, in the post-rebellion decades and relative to the control areas, Early Taiping areas—but not Late Taiping areas—had a larger fraction of arable land remaining idle, suggesting a lower extent of land reclamation. These results are consistent with the property rights hypothesis that the Late Taiping areas had better protection of land property rights and should experience faster post-war population recovery, as well as more land reclamation. *Second*, the local governments in the Taiping areas had a higher level of tax (*likin*) revenue in the post-rebellion period, especially in the Late Taiping areas. This is consistent with what Tilly (1992) called "war made the state," which manifests as strengthened local state capacity in our context. *Third*, some rebellion areas experienced significant social transformation, as captured by the number of charity organizations. While the Taiping areas, on average, did not experience significant social transformation, the Late Taiping areas witnessed a significant increase in the establishment of charity organizations.

We go on to examine the impact of the rebellion on long-term development. We use cross-sectional regressions to examine the associations between the rebellion experience and development outcomes, along with a battery of robustness checks. We obtain several findings. *First*, Late Taiping areas—but not Early Taiping areas—have stronger long-term development than non-Taiping areas. In particular, in the Late Taiping areas, the agricultural and industrial output per

capita was 90 percent higher in 1982, and the GDP per capita in 2010 was 87 percent higher. In addition, the fiscal revenue per capita in 2010 is 203 percent higher. These results are robust under a range of robustness checks. Importantly, they are not driven by omitting other historical events. We also find that the Late Taiping areas, but not the Early Taiping areas, exhibited more vibrant industrialization in the 1930s, thereby mitigating the concern about confounding factors over a long span of history. These patterns are consistent with the property rights hypothesis, which posits that stronger property rights in Late Taiping areas should have stronger long-term development than other areas. *Second*, a higher post-rebellion *likin* intensity is associated with a higher level of human capital accumulation today. This is in line with the *likin*-as-fiscal-capacity hypothesis, which suggests that the improved fiscal capacity due to the rebellion can augment long-term public goods provision. *Third*, a notable channel for the Late Taiping effects is social change, as the Late Taiping effects, though still strong, are significantly attenuated once the number of post-rebellion charities is held constant. The post-rebellion number of charities itself has significant associations with most of the key long-term development outcomes, including the average output, fiscal capacity, and industrialization. These patterns offer support for the social change hypothesis that strong social capacity facilitates long-term development.

We also find that the lasting impact of the rebellion on long-term social cohesion and civic engagement. Using a contemporary nationally representative survey, we find that primarily in the Late Taiping areas where local elites led the fight against the rebels, individuals today have stronger trust in their personal network (i.e., relatives, friends, and coworkers), a higher level of attention to politics, and more engagement in local affairs. This suggests that the rebellion-induced cooperation experience fostered beliefs that value connections to local communities; this is similar to the long-term effect of self-government experience in Italian cities, as documented by Guiso et al. (2016). Strong social cohesion and civic engagement can enhance social resilience, enabling communities to better cope with hardships. We further provide corroborative evidence by studying the Great Chinese Famine (1959–1961), which was caused by central planning failures and radical grain procurement policies (Li and Yang 2005; Meng, Qian, and Yared 2015; Kasahara and Li 2020; Yang 1996). We find that the Taiping areas had significantly fewer deaths from the Great Chinese Famine, and this effect is more pronounced in the Late Taiping areas, precisely where we see enhanced social cohesion and civic engagement. The social capital and social capacity fostered in one of the largest human disasters in select areas thus reduced the harm of another human disaster a century later.

In summary, the body of evidence suggests that while the rebellion itself was undoubtedly a disaster, insofar as it led to favorable changes in property rights, fiscal capacity, and social capacity

in *certain* areas, it ultimately facilitated subsequent economic and social development in these selected areas.

Our paper contributes to several strands of literature. The first concerns the long-run impact of wars (for a survey, see Blattman and Miguel 2010) and how countries recover after large historical shocks, such as major wars.[3] We add to this literature by showing that wars can facilitate long-term development in select regions, partly through the mechanisms of fiscal capacity and social change. The novelty of our study lies in detailed examination of one of the most consequential wars in human history; we show how it impacted land property rights, local fiscal capacity, and social capacity, and we further study long-term economic activities, fiscal capacity, industrialization, human capital, modern-day civic attitudes, as well as the extent of harm caused by the Great Chinese Famine. Understanding the long-term impacts of this monumental war, a critical juncture in China's history, is important in and of itself, as there has been little quantitative examination of this subject. Li (2014) examines the impact of the rebellion on subsequent imperial civil service exam (*keju*) quotas. Li and Ma (2016) study the medium-term (i.e., half a century) impact of the rebellion on population and the mechanisms of industrialization. Hao and Xue (2017) examine the impact of migration associated with the rebellion on public goods provision. Bai, Jia, and Yang (2023) explore how the rebellion shaped the political power distribution in the late Qing dynasty. Yet, none has examined the rebellion's long-term impacts on modern development outcomes as well as its impacts on social trust, civic engagement, and the collective handling of the Great Famine caused by central planning failures. Similarly, no existing studies consider the mechanisms examined in our paper: property rights, fiscal capacity, and social capacity.

This paper is also related to the literature on the determinants of long-term development. This literature has emphasized the incentive effects of institutions and property rights (North 1981; Mokyr 1990; Glaeser and Shleifer 2002; Acemoglu et al. 2001, 2002), the role of geography (Diamond 1997; Gallup, Sachs and Mellinger 1999; Nunn and Puga 2012), the role of human capital (Galor and Moav 2002; Doepke 2004; Glaeser et al. 2004), the importance of cultural factors such as beliefs, ideas, and trust (Galor 2022; Mokyr 2016; Putnam 1994; Bisin et al. 2024), and the role of large population shocks attributable to technological change (Galor and Weil 2000, Galor and Moav 2002; Voigtlander and Voth 2013a, 2013b). We show how a large civil war shaped regional variations in land property rights, fiscal capacity, and social capacity, all of which contribute to explaining the large Intra-China Divergence.

Finally, our paper relates to the literature on state capacity, social capacity, and development.

[3] See Cerra and Saxena (2008), Davis and Weinstein (2002), Brakman et al. (2004), Miguel and Roland (2011), Organski and Kugler (1977), Azariadis and Drazen (1990), and Besley and Reynal-Querol (2014).

The work on state capacity underscores the need to model various factors, including state capacity as a form of endogenous investment, the importance of executive constraints in facilitating state capacity, and the role of wars in shaping state capacity (Acemoglu 2005; Besley and Persson 2009, 2010; Dincecco and Wang 2022). In this vein, Acemoglu and Robinson (2019) coined the phrase "Red Queen effects" to emphasize the parallel growth of both state and society as the key to the long-term prosperity of nations.[4] There is also a large literature on state building, mostly focused on European countries,[5] which finds that an increase in state capacity resulting from wars is associated with positive long-term development (Gennaioli and Rainer 2007; Dincecco and Prado 2012; Michalopoulos and Papaioannou 2013; Dincecco and Katz 2016). Typically, the enhancement of state capacity is accompanied by strengthened executive constraints, which may facilitate tax compliance and increase fiscal expenditure on public goods. However, "comparative research on state building in other parts of the world such as Asia and Latin America is in its infancy" (Johnson and Koyama 2017, p. 15; see also Koyama, Moriguchi and Sng 2018). Here, we contribute to the literature by showing that the Taiping Rebellion strengthened local state (fiscal) capacity, but through fiscal *decentralization* rather than fiscal *centralization*, as is typical in the existing studies (Dincecco 2015, Hoffman 2015; Koyama, Moriguchi, Sng 2018). We suspect that the fiscal decentralization resulting from the rebellion achieved two things: it strengthened both local state capacity and local social capacity, which increased checks on the central government's power. Moreover, we present novel evidence that the rebellion also contributed to the development of charities, which is positively associated with development metrics one and a half centuries later. In this regard, our study complements Xue (2021), who offers a novel finding that the development of charities in Qing China affects modern-day generalized trust and political participation.

The rest of the paper is organized as follows. Section II introduces the institutional background and develops the hypotheses. Section III describes our data. The following four sections present our findings: the impact of the rebellion on population (Section IV), the impacts on property rights and fiscal capacity (Section V), the impact on social capacity (Section VI), and the long-term impacts on development (Section VII). Finally, Section VIII concludes.

II. Institutional Background and Hypotheses

In this section, we describe the historical background of the Taiping Rebellion and the hypotheses on how the rebellion regions might be affected. We focus on the rebellion's consequences for

[4] See Johnson and Koyama (2017) for a survey of this literature.
[5] See North et al. (2009), Dincecco (2009), Karaman and Pamuk (2013), Arias (2013), Dincecco and Katz (2014), Hoffman (2015), and Koyama and Johnson (2017).

population, land property rights, local fiscal capacity, as well as local social capacity; we then discuss potential long-term consequences.

The Taiping Rebellion, lasting from 1850 to 1864, unfolded against the backdrop of profound economic and demographic changes in Qing China. In the century preceding the rebellion, the Qing Empire's cultivated land area stagnated while its population tripled (Wu 1950), leading to strong Malthusian population pressures. Moreover, record-low temperatures triggered severe natural disasters. Externally, Western powers encroached significantly on Chinese sovereignty. The Nanjing Treaty, which China was forced to sign after losing the Opium War to Great Britain in 1842, opened Shanghai as a major port for foreign trade, thereby diverting a substantial share of port businesses and customs revenue away from Guangdong province. Furthermore, being located furthest from the capital Beijing, Guangdong and Guangxi provinces were subject to the weakest central control while experiencing severe adverse trade shocks. All these factors contributed to the outbreak of a rebellion in the Guangdong-Guangxi region (Miguel et al. 2004).

The rebellion led to the establishment of the Taiping Heavenly Kingdom (TPHK), with Jiangning (Nanjing today) as its capital.[6] During its reign, the TPHK controlled the southern provinces of Jiangsu, Anhui, Hubei, Jiangxi, and Zhejiang. Figure 2 maps the territory of the Taiping regime. Note that the regime's territorial control was *incomplete*: some territories were controlled by the TPHK regime, while others remained under the Qing government; and the territorial control frequently changed hands. The rebellion had tragic and devastating impacts on population levels. The war affected 18 provinces and resulted in massive casualties; including indirect deaths attributed to plague and famine, it is estimated that at least 20 million people perished (Platt 2013; Ho 1959, p. 246-247; Cao 2001, p. 553; Li and Lin 2015), making the rebellion one of the deadliest wars in human history.[7]

Aside from these impacts on population, the rebellion also resulted in changes to institutions that might have affected development, including effects on regional land property rights, decentralization, fiscal capacity, and social capital. With the massive scale of the rebellion, these institutional effects are unprecedented. The rebellion disrupted the Qing government's *status quo* land policy that granted ownership to landlords, and it granted *de facto* (and sometimes *de jure*)

[6] In the paper, we use "TPHK" and "Taiping" interchangeably.

[7] Platt (2013) suggests that a widely accepted estimate of the death toll is "at somewhere between twenty million and thirty million people." This may be a conservative estimate. Ho (1959) and Cao (2001) estimate the death toll to be 70–100 million. More recently, using a prefecture-level panel dataset on population and a difference-in-differences approach, Li and Lin (2015) estimate that the rebellion killed 71 million people. Despite variation in these estimates, they confirm the Taiping Rebellion to be one of the deadliest wars in history. By way of comparison, there were approximately 698,000 deaths in the American Civil War (1861–1865) (Barceló et al. 2024).

land property rights to tenant farmers in some areas. It also forced the Qing government to decentralize and introduce a new trade and commercial tax collected by local governments. In addition, local elites led the fight against the rebels and post-war reconstruction, fostering greater social cooperation.[8]

In the following sections, we discuss the institutional impacts of the rebellion in greater detail and formulate hypotheses regarding their implications for development. Figure 1 offers a graphical summary to organize our hypotheses.

II.1. Land property rights

The rebellion altered land property rights in the Taiping areas. Traditionally, the revenue of the Qing Empire came mainly from land taxes paid by landlords, who collected rents from tenant farmers. The empire protected the rights of landlords to ensure that tenant farmers paid the rents (Guo 1991, p. 238). The rebellion changed *de facto* (and sometimes *de jure*) land ownership. Though the TPHK regime proposed an egalitarian redistribution of land, this policy was *not* implemented due to the lack of capacity and the urgent need to collect taxes to finance the war (Bernhardt 1987).[9] Nevertheless, the rebellion disrupted the *status quo* land ownership structure.

The methods used by the Taiping government to collect land taxes changed over time. Guo (1991) documents that tax collection methods differed between the areas that the Taiping Army occupied early on (i.e., up to 1859, hereafter referred to as "Early Taiping" areas) and those that the Taiping Army occupied in later years (i.e., from 1860 until the end of war, hereafter referred to as "Late Taiping" areas). In the early stage, the Taiping Army expanded mainly in Jiangxi, Hubei, and Anhui provinces. Because army officials did not have the capacity to collect land taxes, Taiping leaders financed their war mainly through looting, confiscation, and contributions from residents in conquered areas, rather than through land taxes (Wu 1950; Gu 2006). Starting in 1854, the Taiping regime's land policy was to continue the land system of the Qing Empire, and to collect the land tax from the landlord as usual (Bernhardt 1987, p. 394). However, the old land system was destroyed because landlords were repressed, and most land title deeds were lost. Moreover, the

[8] We concentrate on the Taiping Rebellion's influences on property rights, fiscal capacity, and social change because of their prominence and availability of appropriate measurements. Admittedly, there may exist other mechanisms through which the rebellion affected subsequent development. We are not able to exhaust all possibilities; however, we try our best to shed light on the measurable mechanisms and the ones that we deem the most important. We encourage future studies to explore other aspects of the rebellion's influence. Additionally, one challenge to our investigation is the existence of other historical events, e.g., other wars in China's modern history. Throughout our empirical investigation, we carefully tease out the influence of confounding factors.

[9] A more cynical view would argue that the TPHK regime merely used the land redistribution policy as a slogan to attract recruits rather than as a genuine commitment.

anti-rent movement made landlords unable to collect enough rents to cover their tax liabilities.[10] Landlords thus avoided registering their land with the Taiping government, resulting in ambiguous land property rights in the Early Taiping areas.

Such ambiguity in land ownership would leave tenant farmers vulnerable to expropriation and discourage investment in maintaining land quality, land improvement, and reclamation of idle land (i.e., land that used to be cultivated but is currently in a state of disuse). Before the rebellion, these investments would have been undertaken by the landlords. This under-investment effect likely persisted both in the short run and in the long run. In the short run, farmers would over-farm the land, thereby eventually resulting in more idle land. Weak property rights also limited the extent to which land could act as collateral for loans or be traded (Besley and Ghatak 2010). In the long run, the land policy and its effects likely persisted even when the Qing government restored control. After the rebellion's failure, a large share of landlords and land ownership deeds disappeared. Without a clear sense of ownership, cultivating tenants would be less willing to reclaim arable land that had fallen idle during the war. Therefore, ambiguous property rights and associated adverse effects were likely to persist.

The *Late Taiping land policy* began in 1860 (Guo 1991), when the Taiping Army occupied Jiangsu and Zhejiang provinces. The new policy only applied to the new territories, but *not* to the Early Taiping areas. By this stage, the Taiping Army faced mounting war financing pressures, as the Qing-backed armies and militias had intensified their counterattacks, and the cost of modern weapons rose dramatically because the British assisted the Qing forces to fight against the Taiping Army with modern weapons (Platt 2013). Moreover, as the Taiping Army had established strong control over the newly conquered territories and intended to harness them as a base for long-term operations near the capital Nanjing (Spence 1996), Taiping leaders had a longer ruling horizon for the new territories at that time. Thus, they implemented new land policies in the Late Taiping areas, behaving more like stationary bandits who have a long-term incentive to expand the tax base and to encourage production and investment (Olson 1993).[11]

In 1860, the Taiping leaders experimented with policies to collect land taxes in the new territories. Initially, they adopted a "landlord registration and payment" system similar to the Qing's

[10] To gain peasant support, the Taiping Army often executed landlords connected to the Qing government with large holdings in the occupied territories, and/or confiscated their properties. As a result, a large share of landlords fled and absentee landlords were commonplace (Guo 1991, p.188-201). Emboldened by the army's repression of the landlords, the anti-rent movement of tenant farmers spread in the Taiping-controlled areas (Luo 1955, p. 210). The destruction from the war led to the loss of most land title deeds and the public title deed records in these regions (Wang and Wang 1902, Vol. 27, Part II, p. 4), leading to ambiguity in land ownership even after the war.

[11] The Qing rulers can also be seen as stationary bandits, as they had established control over China. Here, we focus on regional variation in Taiping rebels' horizons between Early and Late Taiping areas, which shaped their incentive to implement the Late Taiping land policy.

status quo land policy. However, they soon found this approach inadequate for ensuring landlord compliance. The leaders promptly switched to a system of direct tenant payment (i.e., directly collecting taxes based on cultivation, or 作佃交粮), which quickly proved effective, and, as a result, was widely adopted in the new territories (Bernhardt 1987; Guo 1991, p. 258-272). Under this new land policy, *cultivators* were urged to register their land. They complied readily because the implied tax rate was lower under the new policy than that under the Qing (Luo 1955, p. 208), consistent with the idea that Taiping officials acted more as stationary bandits in Late Taiping areas than in Early Taiping areas. Furthermore, the Taiping government established stronger grassroots governance than had been the case in the earlier era: the Taiping government now designated village officials, and land registration expanded, significantly improving the enforcement of tax collection (Bernhardt 1987). Importantly, tenants viewed their payment of taxes as *implying ownership of land* (Luo 1961, Vol. 1, p. 279). Furthermore, from 1861 onward, Taiping leaders started issuing new land deeds in some prefectures in Jiangsu and Zhejiang. As a result, a large share of tenant farmers was granted land ownership, which made them both *de facto* and *de jure* owners (Luo 1955, p. 209). Thus, the Late Taiping land taxation system was more coherent, and tenant farmers in the new Taiping territory became *de facto* (and sometimes also *de jure*) landowners, which facilitated tax compliance.

As *de facto* (and often *de jure*) landowners, tenant farmers in the Late Taiping areas would treat their land as their own and invest adequately in land improvement, including reclaiming idle land. Since labor effort is a critical input in agricultural production, transferring property rights to tenants, as occurred in the Late Taiping areas, likely increased efficiency due to stronger incentives for cultivators (Besley and Ghatak 2010).

We expect these positive effects of the Late Taiping land policy to persist in the Late Taiping areas. As labor was scarce in the post-war era, the peasants' rising bargaining power would likely allow them to maintain the land property rights acquired during the rebellion. The war experience likely enhanced the peasants' ability to organize collective action, and they thus posed a greater and more credible threat to the government and the landed class. This would limit the scope of government expropriation. Indeed, historians document that the land rights granted to cultivators during the Taiping rule were respected after the Taiping regime's fall (Zhang 1996; Zheng 2008). Thus, the positive effects of a clearer definition of land property rights in the Late Taiping areas may also persist after the Taiping rule ended. Therefore, we expect better long-term development in the Late Taiping areas. Note that this clarification of property rights means an advantage for the Late Taiping areas relative to the Early Taiping areas. There is no strong reason to assume that the clearer definition of property rights in the Late Taiping region would lead to a relative advantage

over the control region that did not experience the Taiping rule.

The property rights hypothesis. Relative to the Early Taiping areas, the Late Taiping areas had better defined land property rights, and thus, they should have a lower share of idle land. The Late Taiping areas should also have faster post-war population recovery and better long-term development.

II.2. War financing and fiscal capacity

The rebellion led the Qing government to reform its tax collection practices. Specifically, to finance the war against the rebels, taxation was decentralized to local elites and officials, especially in places where there was a strong need to fight the rebels. The Qing government had to decentralize taxation because its fiscal capacity had been weak and declining over time (Rosenthal and Wong 2011), and its central army was not an effective fighting force. While adverse weather conditions and the indemnity paid to Great Britain played a role in the weak fiscal capacity, the key factor was the large territory size and widespread corruption (Sng 2014; Koyama, Moriguchi, and Sng 2018). To prevent revolts, the emperors had to limit the effective tax burdens placed on peasants. The empire's vast territory made it costly and difficult to effectively monitor (remote) local officials, many of whom took large bribes and granted tax waivers. As a result, the Qing government set a low tax rate and collected limited fiscal revenue. With this weak fiscal capacity, the Qing Army simply had no means to contain the Taiping rebels.

With the Qing Army unable to resist the fatal threat posed by the Taiping rebels, the Qing government encouraged local gentry and officials to raise and/or expand local militias, a practice that was fairly common even before the rebellion (Kuhn 1970). A new militia system emerged (Wu 1950), along with a drastically different financing system. In 1853, a local official in the rebellion region introduced a local tax called *likin* (Beal 1958).[12] There were basically two types of *likin*. The first was a transit tax, levied on the goods transported by travelling merchants. The travelling merchants could be taxed either multiple times along their route or only at the departure and destination points of the trip. The second type of *likin* was a business tax on the sales of goods by resident merchants in marketplaces or workshop stores, applied to each sale transaction. There were many varieties of business *likin* taxes, such as the pier tax, monthly levies at market gates, shop contributions, establishment levies, as well as the general commodity tax (i.e., a one-time levy on commodities such as tea, silk, and other fabrics). The *likin* taxation soon spread to all provinces (Beal 1958), becoming a regular tax in the late Qing period and continuing through the early

[12] For a brief introduction of *likin*, see http://www.chinaknowledge.de/History/Terms/lijin.html, as well as Beal (1958), Luo (1936), and Peng (1992).

Republican era until 1931, lasting nearly a century.

The implementation of *likin* was decentralized. Each province organized the tax according to its needs. This was reflected by the varying rates across provinces, ranging from 1.2 percent in Hubei to 3–4 percent in Shanghai on commodities. Over time, business taxes became the main type of *likin*. Indeed, in the last half century of the Qing dynasty, the general commodity tax accounted for 92 percent of *likin* tax revenues (Peng 1992). A key consequence of *likin* taxation was the strengthening of local governments' tax administration: *likin* collection was initially organized by the military agencies, but over time it shifted to specialized *likin* bureaus. This build-up of local fiscal capacity, as we shall see later, would greatly facilitate development in some areas.

Overall, the adoption of *likin* resulted in "a new balance between the central and provincial governments that was to shift steadily in favor of the latter" (Fairbank 1992, p. 238). Tellingly, by the end of the Taiping Rebellion, local *likin* revenue was 3 to 4 times the income collected by the central government (Peng 1992). This fiscal decentralization reversed the millennium-long tradition of centralization in China dating back to the Qin dynasty (since 221 BCE, with some interruptions between the Han and the Sui dynasties; see Huang 2023, p. 243-245). It gave rise to a new regionalism that changed the course of Chinese history. Since then, the power and resources of local governments have become the main constraint on the Chinese central government's power.

What were the long-term effects of the *likin* system? If viewed solely as a form of taxation, it could have negative long-term effects. Heavy transit taxes, such as the first type of *likin*, could hinder inter-regional trade, encourage autarky, and impose large burdens on producers and traders. Moreover, the *likin* system may create incentives for power struggles and abuses, which may result in distorted resource allocation, as evidenced by the warlord competition for territorial control in early twentieth-century China (Huang et al. 2021).

An alternative perspective on *likin* is that by establishing a local taxation system, it could contribute to the development of local fiscal capacity. Facing the brutalities of the war, physical safety and property protection became the top priorities for the gentry class in the Taiping-threatened areas. Local gentry, merchants, and well-to-do farmers would willingly comply with the collection of the *likin* tax to finance fights against the Taiping rebels (Zheng 2009). Since the Late Taiping areas (in Jiangsu and Zhejiang provinces), which largely overlapped with the Lower Yangtze region, experienced greater violence while also possessing more wealth (Pomerantz 2000), the level of *likin* collection and mobilization should be higher in these areas. Moreover, once the tax apparatus was established, the future cost of tax collection would become lower, giving local officials a vested interest in maintaining *likin* collection. Taken together, higher *likin* revenue in the Taiping-affected areas would have persisted.

This perspective on *likin* as local fiscal capacity implies positive long-term effects, especially in regions with favorable pre-conditions. Often strengthened during interstate wars, fiscal capacity is viewed in the literature as a key prerequisite for development, expanding the extent of the market, and enabling the development of modern infrastructure and market-supporting institutions. More broadly, fiscal capacity relates to state capacity, namely, the government's ability to implement a range of objectives and policies. State capacity has been emphasized as playing a critical role in long-term economic development (Besley and Persson 2010; Johnson and Koyama 2017).[13] Equally important, the rise in state capacity associated with wars was often accompanied by stronger executive constraints, as raising taxes often required the cooperation of local elites, which typically increased their power.

There are reasons to believe the implementation of the *likin* system could have facilitated long-term development. *First*, *likin* collection enabled the gentry to resist the rebels, which reduced violence and destruction and should facilitate long-term development. Even in Taiping-held territories during the rebellion, the Taiping Army only had control over some areas, and the remaining areas were controlled by the local gentry (Fairbank 1992). The ability to raise *likin* allowed the gentry to maintain control, reduce casualties and property damage, and mitigate the adverse effects of the rebellion. *Second*, the *likin* system drastically expanded the tax base and covered the modern sectors. Prior to *likin*, land taxes were the main source of government revenue. Since *likin* was levied mostly on manufactured goods and commerce, local officials would have stronger incentives to support these sectors, much like what local officials have done in recent decades in contemporary China (Cull et al. 2017). Such government support has always been indispensable for business success in China, due to the overwhelming strength of the state, both historically and now (Acemoglu and Robinson 2019, Chapter 7; Cull et al. 2015; Huang 2023; Miao et al. 2024). Capitalists would likely have gained a stronger voice in local politics, and this could facilitate the development of institutions such as public schools to complement their technologies (Galor et al. 2009) or charity organizations to support the urban poor, who are an important source of cheap labor for early industrialization. This would have facilitated industrialization, increased incomes, and supported technological change, which in turn would have raised the returns to human capital and increased schooling, thus further promoting modernization (Galor and Weil 2000). *Finally*, the *likin* system increased local leaders' economic

[13] Indeed, state capacity is viewed as a key ingredient of the East Asian Miracle (Wade 1990), and the lack of it is viewed as a key factor behind the economic failure of African and Latin American countries (Herbst 2000, Centeno 2002). The importance of state capacity is further supported by both cross-country evidence (Gennaioli and Rainer 2007, Dincecco and Prado 2012, Dincecco and Katz 2016) and within-country evidence (Michalopoulos and Papaioannou 2013).

and political power, which could have constituted some executive constraints on the central government.[14] Note that these three potential beneficial effects of *likin* are conditional and are more likely to occur in regions that have a strong gentry class and better initial conditions for modern sectors to develop.[15] We thus have the following hypothesis.

The conditional likin-as-fiscal-capacity hypothesis. The level of *likin* revenue should be persistently higher in the Taiping-controlled regions than elsewhere, especially in regions where the gentry was stronger. In regions with a strong gentry presence and with more favorable initial conditions, the stronger local fiscal capacity generated by the *likin* system would facilitate better long-term regional development.

II.3. Social change

Social culture often co-evolves with institutions and has long-lasting consequences for development (Bisin et al. 2024). Besides changing formal institutions such as property rights, the rebellion also facilitated favorable social change in some areas, in terms of the development of social organizations and social capital. China has had a long-standing tradition of local governance (Duara 1988). Local elites had been involved in local affairs from the Song dynasty (960–1279 CE) onward and especially from the Late Ming dynasty (i.e., 16th century), as commercialization and

[14] There is suggestive evidence that local power relative to the power of the central government did indeed substantially increase in the post-rebellion Qing era (Chen et al. 2023). During the Boxer Rebellion of 1900, the central government declared war against the Western powers. However, multiple mostly southern provinces such as Guangdong, Anhui, Shandong, Jiangsu, Fujian, and Zhejiang refused to carry out the central government's orders to participate in the war. This was the so-called "Mutual Defense of the Southeastern Provinces" incident (东南互保). Such independence from the central government was impossible without substantial local capacity.

[15] Our argument suggests a complementarity between the *likin* system and the power of local elites, which complements the influential work by Duara (1988). Duara studies a different kind of tax in northern rural China during the first half of the 20th century—*tankuan* (摊款), which was an informal levy that a village had to pay to the upper (or central) government. He argues that *tankuan* tended to make traditional local elites give up local leadership positions and attract village leaders more adept at collecting the informal levies, thus damaging local governance. In spirit, he posits that a more cohesive local community would benefit local development, which we discuss soon in Section II.3. We view our results as complementary, rather than contradictory, to the point in Duara's book. It is useful to note the distinction between *tankuan* and *likin*. *Tankuan*, as informal levies imposed by villages to meet the financial demands of the state, was more arbitrary and volatile over time: for instance, it increased dramatically after the Nationalists came to power in the 1920s and wanted to hike central tax revenues. By contrast, *likin* arose from the decentralized local collection of taxes, mostly on commercial and industrial goods in urban areas (not in villages), and it was more institutionalized in the wake of the Taiping Rebellion until its abolition in 1931. Keep in mind that *likin* financed the war against the Taiping rebels, which was quite damaging to local prosperity, and the higher *likin* revenue in some regions represented collective efforts between the elites and commoners in containing damages from the rebellion (e.g., in Hunan, Zeng Guofan effectively organized the Hunan Army to defeat the Taiping rebels). Therefore, *tankuan* and *likin* differ in many aspects: village versus urban, agricultural production versus commercial-industrial production, being arbitrary versus being more institutionalized, and being centralized versus being decentralized. So, what is said about *tankuan* at the village level in Duara's book cannot be automatically extended to the regional data at the prefectural level. For instance, we can imagine that local tax capacity helps the development of local schools in urban areas, while at the same time, volatile and arbitrary informal levies at the village level hurt local cohesion and village prosperity.

merchant wealth led (and enabled) local commercial elites to engage in local provision of public goods, especially in Lower Yangtze region (Wang 2022, p. 126; Rankin 1990). Local elites also elevated their social status through philanthropy. Local elites' involvement in local affairs continued throughout the Qing dynasty, in part because the small Qing bureaucracy failed to provide necessary public services to accommodate the rapid population growth and expansion in territories (Skinner 1977). This vacuum of the state, along with the flourishing of local elites under the state-local elite partnership (Wang 2022, p. 126), created room for local elites to manage local affairs. While Qing local officials concentrated on taxation and the judiciary, local elites were heavily involved in managing education, water control, welfare services, famine relief, roads, ferries, bridges, and temples and shrines (Duara 1988; Rankin 1990), most of which are now typically the government's responsibilities.[16] In addition, the increasing social disorder and conflict in the Qing dynasty also prompted local elites to form local militias to maintain order and protect their properties (Kuhn, 1970), which further and drastically enhanced the influence of the local elites.

How did the Taiping Rebellion empower the local elites? Since the official Qing Army failed completely to counter the rebellion, the emperor had to allow and encourage local elites to organize and train local militias, especially in the commercial regions where local militias were widespread (Kuhn 1970; Rankin 1990; Bai, Jia, and Yang 2023). Moreover, when *likin* became the key taxation instrument for financing local militias, "the lack of a prescribed administrative format in the early days of *likin* made it inevitable that local gentry managers played a major role" (Kuhn 1970, p. 161). Furthermore, in commercial regions with foreign trade ties, such as Ningbo city and Yin county (of Zhejiang province, in the Late Taiping region), local elites, as exemplified by Chen Zhengyue, raised funds for militias and took the unprecedented step of funding and recruiting British and French mercenaries to fight alongside local militias against the Taiping Army.[17] This collaboration between the state and local elites was a driving force behind the Qing's triumph over the rebels (Zheng, 2009).

After the war, the local elites forged stronger bonds with the poor, who had joined the fight against the rebels and shared the life-and-death risks. The shared wartime experience might have fostered a new social contract between the elites and the poor, marked by greater trust and solidarity. In turn, this could have led to beneficial social change, much like what happened after the Second

[16] The importance that local elites played then is underscored by the finding that the prosecution of local elites during the early Qing dynasty was associated with a significant decline in local literacy rates in the early 20th century (Koyama and Xue 2015).

[17] Yin county, for instance, had well-developed banks and stronger commerce, county schools, and the largest private library in China at the time.

World War in the northern United Kingdom, where the support for social insurance programs became permanently stronger (Heldring, Robinson, and Whitfill 2022). This is also similar to how decentralization increased the power of civil society relative to the central government in the Long Divergence between the Muslim and the Christian worlds (Bisin et al., 2014). Moreover, in the areas where local elites played decisive roles in achieving victories over the rebels, they gained unprecedented respect and power (Zheng 2009). With this strong bargaining power in the post-war reconstruction era under decentralization, local elites could be influential in local governance and facilitated the emergence of a new social contract.

One manifestation of this new social contract was the rise of pro-poor charities, including the "benevolent hall" (*shantang*). According to Rowe (2009, p. 120-121), the benevolent halls, which started to appear in the 1820s in commercial cities of the Yangtze valley, were built "with much greater frequency in the turbulent years of post-Taiping reconstruction." These halls were managed and financed by local merchants and urban property-holders. They offered services such as disaster relief and medical aid, and in some locations, they also sponsored local peacekeeping militias. The rise of such charities was more pronounced in the Taiping areas with stronger local elites, whose importance grew through their roles as *likin* collectors. For instance, Chen Zhengyue, who led the fight against Taiping rebels in Yin county, undertook a wide range of activities in the post-war era, including "building up sacrificial halls, repairing sea dams, dredging rivers, setting up examination halls, and establishing orphanages"; he also managed disaster relief in other provinces (Zheng 2009, p. 73). The rising power of local elites after the rebellion resulted in "an independent, locally based public sphere" (Zheng 2009, p. 74). Indeed, local public activism by elites became institutionalized in places such as Ningbo, and elites actively participated in post-war reconstruction (Rowe 1992, p. 259, 268, 318-320; Rankin 1986; Zheng 2009). These local elites played important roles in social mobilization, the provision of public goods, and the establishment of new local organizations and charities (Rankin 1986, 1990; Schoppa 1982).

By reaching a wider range of groups than traditional clan-based organizations, these new local charities could help build connections across classes and socioeconomic statuses, and they should be viewed as "bridging social capital" (Woolcock and Narayan 2000; Gittell and Vidal 1998). Bridging social capital facilitates the spread of generalized trust. Tellingly, Xue (2021) provides evidence that Chinese prefectures with more charities during the Qing dynasty have higher levels of generalized trust today. The development of bridging social capital can facilitate market expansion and labor mobility. Indeed, generalized trust and other measures of social capital (e.g., association density) are positively and strongly associated with economic growth (Knack and Keefer 1997), and they are important in accounting for long-term prosperity in Italy (Putnam 1994).

Historians also suggest that these charities facilitated the development of modern sectors. According to Rowe (2009, p. 121), "the benevolent halls' clear goal was to take care of all who needed their services so that the very profitable local commerce could function smoothly" by benefiting from "the growing presence of an underemployed class of urban poor." Our analysis implies the following hypothesis.

The social change hypothesis. The Taiping Rebellion spurred the development of charity organizations and social capital, especially in the Late Taiping areas where local elites had been more influential. Regions with more charities and stronger social capital would have better long-term development.

II.4. Long-term social cohesion and civic engagement

Social capital and civil society are important for the functioning of government and society (Putnam 2000; Tabellini 2008; Nannicini et al. 2013; Acemoglu and Robinson 2019; Bisin et al. 2024). A high level of social capital furnishes "values and beliefs that help a group overcome the free-rider problem in the pursuit of socially valuable activities" (Guiso, Sapienza, and Zingales 2011). People in a high social capital environment thus are more likely to undertake collective action that holds the government accountable to "do the right things" (Nannicini et al. 2013; Tsai 2007; Cao, Xu, and Zhang 2022). Social capital and the development of civic society are often shaped by institutional changes, and the induced values and beliefs can live on even when the original institutions have long since disappeared (Nunn and Wantchekon 2011; Guiso, Sapienza, and Zingales 2016; Xue 2021; Bisin et al. 2024).

It stands to reason that the social changes brought by the Taiping Rebellion could have a long-term impact on social cohesion and civic engagement. Recall that in the aftermath of the rebellion, local gentry led charity organizations to help with postwar recovery, and such mobilization benefited their local communities (Liang 2001; Bai, Jia, and Yang 2023). The shared experience of fighting against the rebels and the process of gentry-led postwar reconstruction likely encouraged the formation of stronger values of cooperation and reciprocity within local communities. Such values may persist across generations (Bisin and Verdier 2001; Doepke and Zilibotti 2008), despite the dissipation of the original motives. By way of example, Italian cities with self-government experience during the Middle Ages have stronger self-efficacy beliefs today—that is, confidence in one's ability to complete tasks and achieve goals (Guiso, Sapienza, and Zingales 2016). We thus expect the Taiping areas to exhibit stronger social cohesion and more civic engagement today. Since China's network typically relies on the local community (Shirley and Xu, 2025), we expect the social cohesion effect to manifest especially strongly among people's personal networks.

The impact of social cohesion and civic engagement can often manifest as the resilience of communities in the face of disasters. In this vein, the social capital and norms forged by the experience of the Taiping Rebellion may have helped mitigate the fatal effect of political radicalism in the Great Leap Forward (1958–1962). The radical top-down grain procurement policies during 1959–1961 led to the Great Chinese Famine that caused tens of millions of deaths (Li and Yang 2005). In the Taiping areas, which had higher levels of social capital (and thus greater social cohesion), we hypothesize that local officials would be more sympathetic to local communities, and that citizens would have a higher willingness and ability to engage in collective action of assistance, thus mitigating the adverse effects of radical central planning (Cao, Xu, and Zhang 2022; Hu, Yao, and You 2023; Chen 2010).[18] We thus expect that the Taiping areas, especially the Late Taiping areas, where social capital was more developed as a result of the war experience, had fewer famine deaths.

The social cohesion and civic engagement hypothesis. The Taiping areas exhibit greater social cohesion, especially within people's personal networks, and a higher level of civic engagement today. The Taiping areas, especially the Late Taiping areas, had fewer deaths during the Great Chinese Famine.

III. Data and Measurements

Our main dataset covers 266 prefectures in China proper, according to the 1820 delineation of the Qing territory. Of the 266 prefectures, 55 prefectures fell under the jurisdiction of the Taiping regime ("treatment"), while the remaining 211 prefectures did not ("control"). Within the Taiping jurisdiction group, 37 prefectures were in the Early Taiping areas, where land property rights were ambiguous; and 18 prefectures were in the Late Taiping areas and had stronger land property rights. Appendix Table A1 presents the distribution of the treatment and the control prefectures.

To examine the impacts of the Taiping Rebellion, we have collected rich data from various sources. In the following, we briefly discuss the key measurements and variables. More details on the variable definitions and sources can be found in Appendix Table A2. Summary statistics are presented in Appendix Table A3.

Measuring the experience of the Taiping Rebellion. Based on Guo (1989) and Hua (1991), we

[18] There is some evidence on the positive role of social capital on Great Famine deaths. Cao, Xu, and Zhang (2022) find that social capital, measured by kinship-based clan density, reduces famine severity during the Great Famine in the 1960s, and that provinces with higher clan densities had lower excessive grain procurement rates. Similarly, Hu, Yao, and You (2023) find that officials governing their home counties, with which they had social ties, implemented procurement more flexibly preceding the famine and expended more on social affairs such as disaster relief during the Great Leap Forward. Chen's (2010) interviews with peasants in Anhui province report that collective resistance was more likely in the presence of dense local kinship networks.

construct a Taiping dummy that captures all the prefectures under the Taiping jurisdiction (denoted by $Taiping$).[19] Early Taiping prefectures are defined as prefectures under Taiping jurisdiction in the Anhui, Jiangxi, and Hubei provinces; these prefectures had ambiguous land property rights, as discussed earlier. Late Taiping prefectures are defined as the Taiping prefectures in Jiangsu and Zhejiang provinces; these prefectures had more clearly defined land property rights.[20]

Population. Our first measure of key outcomes, especially for earlier years, is population density. In the subsequent regressions, we use the log of prefecture-level population as the dependent variable and control for the prefecture fixed effects; thus, we essentially examine the within-prefecture variation in population density. We are interested in how the Rebellion affected the subsequent evolution of population.[21] We rely on two datasets. The first is Cao (2001), which has been widely used in existing research (e.g., Jia 2014; Chen and Kung 2016). It reports population figures at approximately three-decade intervals between 1820 and 1953. The second source is the Chinese population censuses of 1953, 1982, and 2000. Using historical maps of China, we can merge contemporary censuses with historical population data, taking into account changes in administrative boundaries.[22] In the end, we have prefecture-level population data at seven time points spanning two centuries: 1820, 1851, 1880, 1910, 1953, 1982, and 2000.

Likin. We obtain data on annual provincial-level *likin* revenue from two sources: (i) Luo (1936), and (ii) Second Historical Archives of China (1996). Based on the first source, we calculate the average *likin* revenue for two periods, 1869–1879 and 1880–1908. From the second source, we obtain the average *likin* revenue during 1922–1925. To account for size differences between

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[19] When defining Taiping prefectures, our main source of data is the county-level map of the TPHK (Hua 1991). We first code Taiping areas at the county level using the 1893 Qing delineation of administrative boundaries, then we map them to the 1820 Qing delineation of administrative boundaries (between 1820 and 1893). We thus use the administrative boundaries of prefectures and provinces in 1820. A prefecture is defined as a Taiping prefecture if it had at least one county under the Taiping jurisdiction.

[20] We have conducted a robustness check using the alternative definition of Early and Late Taiping prefectures. We use being occupied largely before or after 1860 to classify the Early or Late Taiping prefectures. 1860 was the year after which the vast majority of Jiangsu and Zhejiang provinces were occupied by the Taiping Army. Specifically, if a prefecture was occupied for a longer period after (before) 1860 than before (after) 1860, it is defined as a Late (Early) Taiping prefecture. For example, if prefecture A is occupied by the Taiping Army for 11 months before 1860, and for 20 months after 1860, then it is defined as a Late Taiping prefecture. This alternative definition largely coincides with our original definition, except for the Jiangning and Zhenjiang prefectures in Jiangsu province, which were occupied before 1860. The results remain qualitatively similar (and they are available upon request).

[21] Good estimates of historical population data are sporadic. Skinner (1977) estimates the population in the core area of cities or towns of China in 1893; similar estimates around the 1920s are presented by Stauffer (1922) and Perkins (1969). Ullman (1961) offers comprehensive population estimates for cities in China in 1938, 1953, and 1957.

[22] We use the administrative boundaries of Qing prefectures in 1820. For each Qing prefecture, we estimate its population in different periods from 1953 to 2000 by calculating the sum of the populations of contemporary counties located within the historical prefecture boundaries. If a county is only partially contained within a Qing prefecture, we apportion its population based on the proportion of its area that falls within the prefecture, assuming that population is evenly distributed within the county.

provinces, we normalize *likin* by the area of the prefecture, yielding *likin* per 1,000 square km.[23]

Charity. The data on local charities come from Liang (2001), which provides the most comprehensive compilation of charities in the Ming, Qing, and Republican eras. The primary sources are local gazetteers spanning the period from the 1400s to the 1940s, which record the establishment time and location of each charity. Following Hao and Xue (2017) and Xue (2021), we measure local social capital using the stock of charities in a prefecture. Specifically, we track the stock of charities in 1820, 1851, 1880, 1910, and 1941. This stock represents the cumulative number of charities established up to each year, under the assumption that charities remained in operation once founded, at least until the founding of the People's Republic of China.[24] While this assumption might be strong, anecdotal evidence suggests that charity organizations persisted for a long time and that local gentry had strong incentives to participate in and sustain these institutions (Zheng 2009). Furthermore, the civic values associated with charities are likely to live on, which also makes the influence of charities long-lasting. Our earlier hypotheses also concern the impacts of the Taiping Rebellion on civic attitudes and engagement; we defer the discussion of those related measurements to Section VII.

Idle land. Our land property rights hypothesis argues that stronger land property rights in Late Taiping areas could encourage farmers to reclaim idle land (i.e., land that used to be cultivated but is now in a state of disuse). To test this hypothesis, we collect data on the share of idle land in 1915, defined as the share of idle land in total arable land. This information comes from a survey by the Republic of China's Ministry of Commerce and Agriculture (1915), which provides county-level data for the Taiping provinces. Ideally, we would want to compare the shares of idle land both before and after the Rebellion using a difference-in-differences approach. However, because the national agricultural survey in China did not begin until the early 1910s, we are forced to rely on cross-sectional regressions.

Long-term development outcomes. To examine the lasting impacts of the Taiping Rebellion on development, we collect variables across several historical episodes. First, we examine China's early industrialization from the 1850s to the 1930s. The first measure is the entry of new industrial firms between 1858 and 1937 at the county level, originally compiled by Du (1991, 2019).[25] The second measure is the county-level industrial output in 1933, drawn from China's only pre-WWII industrial census (Liu 1937). These data have recently been used by Bo et al. (2023) to study military investment and industrial development in China. Second, from the 1982 census, we obtain

[23] Normalizing by population do yield similar conclusions, but the population fluctuates more than the area does.
[24] Liang (2001)'s data do not report any applicable closure dates of charities. However, before the establishment of the communist regime in 1949, it is plausible that charity closures were rare.
[25] Note that 1937 was the year when the Sino-Japanese War broke out.

measures of economic activities and human capital at the prefecture level. Economic activity is measured by the gross agricultural and industrial output per capita. Human capital is measured using the share of middle school graduates in the population and the literacy rate; we also obtain the average years of schooling from the 2000 population census (China Data Center and Spatial Data Center 2017). Finally, we use GDP per capita and fiscal revenue per capita in 2010, drawn from the City Statistical Yearbook.

Control variables. In our regression analysis, we include controls for basic prefectural characteristics that might affect long-term development, such as geography, foreign influence, economic conditions, and political importance. Geographic characteristics include the distance to Yangtze River, to the coastline, to the Grand Canal (i.e., the major canal linking the north and the south), and the number of neighboring provinces of a prefecture. It is important to control for these geographic variables because: (i) we need to hold constant geographical conditions when comparing the Taiping areas to the non-Taiping areas, and (ii) we will later leverage a geographical characteristic (longitude) as the instrumental variable for the Taiping areas, motivated by the spatial variation in the Taiping Army's military strategy (see Section IV.4). We also control for the number of neighboring provinces because prefectures near multiple provincial borders were less tightly controlled by the provincial governments due to free-riding problems and monitoring difficulties, and thus, they were more prone to experience rebellions. All geographical variables are constructed based on China Historical GIS Data (Bol and Ge 2007). In addition, since the literature has documented that the treaty ports system had strong impacts on population growth and income (Jia 2014), we control for the duration (in years) of treaty port status before 1949 and the duration of being designated as a concession or leased territory (Fei 1991),

We further include prefectural economic and political characteristics. We measure the level of land taxes by the average farmland tax per *mu* in 1820 (Liang 1980),[26] the level of human capital by the number of palace graduates (*jinshi*) per million people from 1793 to 1820 (Jiang 2007),[27] and the pattern of agricultural production by dummy variables of silk- and tea-production before the Taiping Rebellion (Wu 1990). To measure political importance, we create four dummy variables based on the Qing classification system in 1820, which assigned prefectures to some combinations of four designations: *Chong* (important for transportation), *Fan* (important for business), *Pi* (difficult to collect taxes), and *Nan* (high in crime). Additionally, since other wars could also affect the outcomes, we control for the frequency of wars since 1776 (Chinese Military History Editorial

[26] *Mu* is a unit of area measurement used in China. 1 *mu* is equal to 1/15 of a hectare, or about 666.7 square meters.
[27] The palace graduates (*jinshi*) are successful candidates in the highest level of the imperial civil service examinations (*keju*). Huang (2023, p. 106-107) argues that *keju* was a key factor in building up local literacy throughout Chinese history.

Committee 2003; Li 2007).[28]

Descriptive statistics. Table 1 compares the differences between the control group (i.e., the non-Taiping prefectures) and the treatment group (i.e., Taiping/Early Taiping/Late Taiping prefectures) in population growth since the pre-Rebellion year of 1820. Before the Rebellion, in 1851, there was no significant difference in population growth rates between the control and the treatment groups.[29] After the Rebellion, by contrast, the Taiping areas had a significant disadvantage in population growth relative to the non-Taiping areas, and this disadvantage may even have widened over time, increasing from 47 log points in 1880 to 57 log points in 2000 (see Figure 3). The *initial* drop in population in the Late Taiping areas, relative to the control areas, was more pronounced than in the Early Taiping areas: the population growth in the Early (Late) Taiping areas was lower than that of the control group by 41 (60) log points in 1880.

IV. The Impact of the Taiping Rebellion on Population

In this section, we start with using a difference-in-differences strategy to examine the impact of the Taiping Rebellion on population growth. The goal of this exercise is to provide evidence for the "first-order" effects of the rebellion on population.

We use the panel data for the 266 prefectures and the seven snapshots of population (1820, 1851, 1880, 1910, 1953, 1982, and 2000). The pre-treatment years are 1820 and 1851,[30] with 1820 serving as the reference year. The baseline regression model is as follows:

$$\ln(pop_{it}) = X'_{i,t}\beta + \sum_{\tau\neq 1820}\beta_\tau D_\tau Z_i + \sum_{\tau\neq 1820}\alpha_\tau D_\tau Taiping_i + \rho_t + \eta_i + e_{i,t}. \qquad (1)$$

In the model, i indexes prefectures, and t indexes years. η_i and ρ_i are prefecture and year fixed effects, respectively. $X_{i,t}$ is a vector of time-varying controls, including the duration of treaty port status, the duration of concessions, the duration of leased territories, and the frequency of wars. Z_i is a vector of time-invariant controls. It includes geographical and historical variables: the distances to Yangtze River, to the coastline, and to the Grand Canal; the number of neighboring provinces; the pre-rebellion level of land taxes per *mu* of land; the total number of palace graduates per million

[28] Historical wars from 1776 to 1911 are coded based on War Chronology of China (Chinese Military History Editorial Committee Ed., 2003), which includes all the wars, conflicts, and revolts in the Qing Empire during the period. More precisely, it includes peasants' revolts against Qing, wars and battles between Qing and foreign powers, conflicts between peasants and foreign powers, and battles in the Xinhai Revolution. Historical wars from 1911 to 1949 are coded based on the Atlas of Historical Wars in China (Li 2007). This data set includes wars and battles among warlords from 1913-1937 as well as battles during the Sino-Japanese War (1937-1945) and during the Chinese Civil War (1945-1949).

[29] Technically, in 1851 the rebellion had just started, but the initial impact and the damage on population should be minimal, and data availability forces us to view 1851 as the plausible pre-rebellion year here.

[30] We have explored including one more pre-treatment year, 1776, and we find that the conclusion that the Rebellion caused a large population drop remains robust.

from 1793 to 1820; dummies for silk- and tea-producing prefectures; the four designations assigned by the Qing government in 1820. The variables in Z_i are interacted with year indicators (D_t) to allow the effects to vary flexibly over time. $Taiping_i$ is a dummy variable that equals one if prefecture i fell under the jurisdiction of the Taiping regime; we allow $Taiping_i$ to have year-specific effects, denoted by α_τ. The coefficient of interest is α_τ, which measures the impact of the Taiping Rebellion on population growth. We cluster standard errors at the prefecture level.

A concern is that the Taiping (treatment) prefectures may differ systematically from the non-Taiping (control) prefectures. To address this, we implement a matching estimator to compare observationally similar treatment and control prefectures (Heckman, Ichimura, and Todd, 1997), following Xue (2021) who also examines Qing-era panel data outcomes. Specifically, we construct a matched sample using the propensity score matching method. The covariates used are: distances to the Grand Canal and to the east coast; taxes per unit of land in 1820; the four post designations assigned by the Qing government in 1820; the dummies for producing tea and for producing silk; the number of neighboring provinces; the number of wars during 1776 to 1820 per capita; and the number of palace scholars (*jinshi*) from 1793 to 1820 per capita. We first estimate a probit model where the reverse Taiping dummy (i.e., $1 - Taiping_i$) is regressed on the above covariates, which yields the predicted probability of a prefecture not receiving the Taiping treatment, i.e., the propensity score. Relying on this propensity score, with replacement, we match a control prefecture to a treatment prefecture that has the closest propensity score. The control units that do not share common support with the treated units are not used in the matching process. With this procedure, a treated prefecture can be compared to multiple similar control prefectures; observations are thus weighted by the times of matches for each treated unit when we run regressions using the matched sample. Table 2 presents suggestive evidence of the validity of the matching approach. In the matched sample, the propensity score and covariates are balanced between treatment and control groups. It is useful to note that the propensity score matching method does not deal with selection on unobservables, but it is transparent and does not suffer from the issue of sensitivity with respect to diverse estimates when using many equally plausible instrumental variables (Young 2017).[31]

[31] Another potential issue in our paper, as in other history-based papers, is that we may have omitted (subsequent) historical events that are related to the treatment event of interest (here, the Taiping Rebellion) *and* may explain the final outcomes. An important question is whether (some of) subsequent historical events were caused by the treatment event. If so, our reduced-form empirical strategy is still valid, and it can identify the total effect of the treatment event. The more serious concern arises when omitted events are not caused by the treatment event but are correlated with both the treatment and the outcome. To alleviate this concern, In Section IV.5, we conduct robustness checks by controlling for a wide range of other historical events. Nevertheless, history consists of an almost infinite number of interrelated historical events, and one cannot exhaust all confounding events. This is a fundamental issue that is relevant for every paper related to history and exceeds the scope of this paper. Nevertheless, this caveat should be kept in mind.

IV.1. The OLS results

We now report the OLS estimation results for equation (1). Column (1) in Table 3 presents the baseline result using the full sample. We see there are no differential pre-trends in population growth between the Taiping and the non-Taiping areas. The estimated coefficient on the Taiping dummy before the rebellion, i.e., in 1851, is small and statistically insignificant, suggesting a lack of selection bias for the Taiping areas conditional on proper controls. After the rebellion, the coefficients on the Taiping dummy increase dramatically in magnitude. There is no sign of post-rebellion convergence in population growth relative to the control group from 1880 to 2000. In 1880, the Taiping coefficient is -0.45, which implies that the population growth rate of Taiping areas in 1880, relative to the pre-rebellion years, is 36 percentage points lower than that of the control group.[32] Such a large drop in post-rebellion population growth demonstrates the devastating impact of the rebellion. This initial drop in population for the Taiping areas is comparable to the population decline that Europe experienced during the Black Death from 1347 to 1351, which killed off 30-60 percent of Europe's total population.[33] When it comes to the longer run, in 1953, the Taiping coefficient is -0.51, indicating that the population growth of the Taiping areas in 1953 relative to pre-rebellion years remained 40 percentage points lower than that of the control group, even one and a half centuries later. The post-1953 disadvantage in population growth of the Taiping areas remains substantial, but during this period, the changes may partially reflect the regional variation in family planning policies installed across China in the late 1970s. The long-term impact of the Taiping Rebellion on population is also demonstrated by the relative decline of the Taiping areas' population share in the total population of all sample prefectures, which went from 34.3 percent in 1776 to 22.7 percent in 2000. In sum, The Taiping Rebellion had a long-lasting impact on population growth.

We conduct several robustness checks for the baseline result. *First*, a concern is that the binary measurement of Taiping Rebellion experience may pick up broad regional dynamics, despite the geographic controls included in the regression. However, to confound our findings, regional dynamics need to have the same timing as the Taiping Rebellion, which we deem not very likely. Nonetheless, to alleviate this concern, we allow the Taiping effects to differ by the Taiping "dose" in columns (2) and (3). Specifically, we interact the Taiping dummy with the log of the number of battles during the rebellion (column (2)) and with the log of the duration of the Taiping occupation (in months) (column (3)). The results remain qualitatively similar: the Taiping Rebellion led to a

[32] That is, $e^{-0.45} - 1 = -36\%$.
[33] See Jedwab, Johnson, and Koyama (2022) for a survey of the impacts of the Black Death.

significant drop in relative population growth rates, and no recovery in population growth rates had taken place. *Second*, to ensure that our results are not driven by the prefectures that experienced the most intense fighting during the rebellion, we exclude six such prefectures (Wuchang, Songjiang, Anqing, Jiangning, Suzhou, and Hangzhou) from the sample (Platt 2013). The results in column (4) are similar to the baseline. *Third*, the Taiping Rebellion had affected subsequent imperial civil service exam quotas (Li 2014), which may influence the trajectory of local human capital development. To ensure that our results are not driven by its omission, we include in column (5) the number of newly selected palace scholars (*jinshi*) in a prefecture since the end of the preceding period (denoted by *Jinshi*).[34] The coefficient on *Jinshi* is insignificant, and the Taiping coefficients remain similar to the baseline.

Another concern is that the Taiping effects on population growth may reflect rebellion-induced migration. We believe that Taiping-induced migration only played a minor role in determining population changes. In his authoritative study on historical migration in China, Ge (1997, p. 469-470) states that, "until 1889, the total number of migrants in all the three provinces (Anhui, Jiangsu, and Zhejiang) was about 5.6 million, less than half of these, or about 2 million, were interprovincial migrants. Treating these three provinces as one region, there were even fewer migrants moving from outside of the region. Thus, after the Taiping Rebellion, migration did not play a significant role in accounting for the population trajectory of the Taiping region, while the population trajectory there was basically based on natural population growth."

IV.2. Addressing spatial autocorrelation

Economic historians recognize the importance of Tobler's law of geography—namely, that adjacent locations are more likely to share common characteristics or dynamics than distant ones (Tobler 1970)—which suggests that omitted spatial interactions could lead to spurious correlations between regional variables of a historical nature (Kelly 2019). To check if our results are robust when accounting for spatial interactions, we estimate a spatial autoregressive model (SAR), which allows for cross-regional interactions between both dependent variables and the explanatory variables as well as the error term.[35] That is,

$$Y_t = \rho W Y_t + X_t\beta + WX_t\theta + \mu + v_t, \quad (2)$$

$$v_t = \lambda W v_t + \epsilon_t. \quad (3)$$

[34] The dataset for palace scholars covers the period 1793–1911. For the base year 1820, *jinshi* measures the newly selected palace scholars in the 1793 to 1820 period. This variable is automatically zero after 1911 (since this exam was no longer held after the fall of the Qing dynasty).

[35] This is implemented in Stata following Belotti et al. (2017).

Here Y_t is a $n \times 1$ vector of the outcomes for all prefectures in year t. X_t is a $n \times k$ matrix of explanatory variables, including the Taiping dummies and control variables. W is the spatial weighting matrix, where we use the inverse distance weights. We control for prefecture fixed effects (collected in the vector μ). In the model, as in equation (2), we allow a prefecture's outcome to be affected by both other prefectures' outcomes and other prefectures' explanatory variables. We also allow for the error term to be spatially autocorrelated, as in equation (3).

To have a preliminary sense of spatial interactions, for specifications of columns (1)–(5), we conduct the Pesaran's test for cross-sectional independence of the error term. The results indicate significant cross-sectional dependence of the error term across regions. Column (6) then reports the SAR estimates based upon the full sample. Even when allowing for spatial interactions, the pattern of the Taiping effects on population growth over time remains similar to what we find in column (1): a persistent and substantial negative gap in population growth in the Taiping areas relative to the control areas, with the gap peaking in 1953.

IV.3. The matching estimates

The results based on the matched sample consisting of 135 prefectures are reported in column (7). Reassuringly, the results remain qualitatively similar to those based upon the full sample in column (1). Since it is important to hold the treatment and control samples comparable, especially when we deal with many other outcomes and when we study the long-term outcomes, for the remainder of the paper, we will report results based on the matched sample when possible.

IV.4. Instrumental variable estimates

The estimated effect of the rebellion could suffer from omitted variable bias if the Taiping areas, conditional on the controls, nonetheless differ systematically from the other areas. To address this concern, we use an instrumental variable (IV) approach. Historical literature detailed below shows that the rebellion leaders adopted a military strategy that resulted in a spatial pattern of occupation associated with longitude. We thus use the longitude of the prefectural seat as the IV for the Taiping dummy, while controlling for key geographical features that may be related to longitude.

The longitude satisfies the relevance condition as an IV for the Taiping dummy. At the onset of the rebellion, the rebellion was joined by a capable river-bandit leader Luo Dagang (罗大纲), who led more than a thousand river bandits (Spence 1996). Since then, the use of the Taiping Navy became a key military strategy of the rebels. In July 1852, the Taiping leaders adopted the following military strategy (Wang et al. 1952, Vol. 3, p. 291): the Taiping Army would first march to *the east* along the Yangtze River, conquer and occupy Jiangning prefecture (Nanjing today), located on the

eastward-flowing Yangtze River, and then use Jiangning as a base to expand. Following this plan and relying on its (then) superb navy,[36] the Taiping Army conquered most key cities from the middle course to the lower course of the Yangtze River, and many nearby cities (see Figure 2). This explains why areas located in eastern China were more likely to fall under Taiping rule, while few prefectures in western China or in the upstream areas of the Yangtze River were under the control of the Taiping Army. It also implies that the longitude likely satisfies the relevance condition to be an IV for the Taiping dummy. Indeed, Table 1 shows that the Taiping prefectures on average have significantly larger longitudes.

The longitude needs to satisfy the exclusion restriction. A concern is that the longitude may affect population through channels other than the Taiping rule. For example, population growth rates in the east may be higher due to more favorable geographical characteristics, such as arable land availability, irrigation potential, or lower transportation costs. This has been considered by our empirical strategy: we control for the prefecture fixed effect, which absorbs the influence of *all time-invariant characteristics*, including initial geographical advantages. Furthermore, we control for the interaction terms of the year dummies with key indicators of favorable local geographical conditions (i.e., the distances to the coastline, to the Grand Canal, and to the Yangtze River); that is, we allow for time-varying effects of geography. Conditional on these geographical controls, the longitude should be excludable in explaining population growth. In Panel C of Appendix Table A4, we regress the same pre-rebellion variables on longitude while controlling for geographical variables, and the results show little correlation between the IV and pre-rebellion variables, suggesting a lack of correlations with unobservable confounders (Altonji et al. 2005).

Since weak IVs can threaten the validity of IV estimates and the existing testing framework focuses on settings with a single endogenous variable, we conduct our two-stage least-square (2SLS) estimation using all pre-Taiping periods (1820 and 1851) and a single post-Taiping period at a time. Thus, we conduct five separate 2SLS estimations for the years 1880, 1910, 1953, 1982, and 2000. The results are reported in Panel A of Appendix Table A4. When pooling the estimations, the results are similar (see column (8) of Table 3). The results in Panel B of Appendix Table A4 indicate a strong IV: all the F statistics for the five separate regressions are above 20 (Staiger and Stock 1997). The magnitudes of IV estimates are larger than those of OLS estimates, but the qualitative results and trends of the Taiping effects on population growth are in line with our earlier results. The results

[36] The Taiping Navy was dominant on the river until the rise of the navy of the Xiang Army led by Zeng Guofan in 1854 (Wang et al. 1952, Vol. 3, p. 276, p. 142).

confirm a persistent negative impact of the rebellion on population growth in the Taiping areas.[37]

IV.5. Robustness checks

We conduct a battery of robustness checks. The details are discussed in Appendices B, C, D, and E. Here, we briefly report these checks.

Controlling for other historical events. To ascertain that our results truly reflect the impacts of the Taiping Rebellion, we show that our results survive when controlling for other historical events. In particular, we consider a variety of events that may be related to population growth and socioeconomic development: (i) the Guangxu Drought (1876–1879); (ii) the Hui Revolt (1862–1877); (iii) the Nian Rebellion (1853–1868); (iv) the internal conflicts in the early period of the Republic of China; (v) the Sino-Japanese War (1937–1945); (vi) the Chinese Civil War (1945–1949); and (vii) missionary activities. Appendix B discusses the measurements used in detail. As Panel A of Appendix Table B1 shows, controlling for these events does not change the conclusion that the Taiping Rebellion had led to a persistent negative impact on population growth.

Taiping regime vs. Taiping conquest. Our baseline results are based upon comparing prefectures under the control of the Taiping regime with those that were not. A concern is that among the control group, some prefectures, though not governed by the Taiping regime, had been affected due to the Taiping Army's temporary conquest. If the conquest had a large impact on population growth, it could bias our baseline results downward. To further validate our empirical strategy, in Appendix C, we examine the robustness of our results when explicitly controlling for the influence of the Taiping conquest. Columns (1) and (2) in Appendix Table C1 show that the effects of the Taiping conquest on population growth were moderate, and controlling for them does not markedly change the estimated effects of the Taiping rule. These patterns provide support for the empirical strategy that focuses on comparing prefectures with and without the Taiping regime being established.

Own treatment vs. adjacent treatment. Another concern is that the Taiping Rebellion may have spatial spillover effects, possibly due to the widespread scope of battles. If so, this may contaminate the control group. The SAR estimates have already demonstrated that spatial spillovers do not drive our results. Here, we provide an additional exercise to address the concern. Specifically, we code whether a control prefecture neighbored a treatment prefecture. Butts (2021) shows that in a difference-in-differences analysis, it is sufficient to control for this variable to address bias due to

[37] While the IV of longitude is the best we can come up with and has multiple attractive features as we mentioned, we cannot rule out that there are omitted determinants that are correlated with the IV. Caution is thus urged in interpreting the IV results.

spillover effects, provided that the potential spillovers are mainly among neighbors. In Appendix D, Columns (1) and (2) of Table D1 show that accounting for adjacent spillovers does not change the conclusion about the effects of the Taiping Rebellion on population growth.

Excluding a province at a time. One may also be concerned about other unobserved shocks that may drive our results. We are not able to exhaust all possibilities and find plausible proxies. Nonetheless, in Appendix E, Figures E1(a) and (b) show that the qualitative conclusion about the Taiping effects on population growth remains unchanged when we exclude control prefectures in a province at a time. This suggests that our results are not driven by province-specific unobserved shocks.

Summary. Throughout Section IV, the results provide robust evidence that the Taiping Rebellion resulted in a persistent decrease in population growth in the Taiping areas relative to the non-Taiping areas. Based on the empirical framework employed in this section, we go on to explore the broader impacts of the Taiping Rebellion on the state and society.

V. Property Rights, Fiscal Capacity, and Population

We now investigate two channels through which the rebellion may have affected population growth: property rights and local fiscal capacity.

V.1. Property rights and population growth

We examine the property rights hypothesis, that is, relative to the Early Taiping areas, the Late Taiping areas that featured more clearly defined land ownership would have less idle land and faster post-war population recovery (see Section II.1). The data on idle land include the share of idle land of 332 counties in the Taiping provinces (Anhui, Jiangxi, Hubei, Jiangsu, and Zhejiang) in 1915. We have data on 151 Early Taiping counties, 95 Late Taiping counties, and 86 control counties (see Panel A of Table 4).

In Panel B of Table 4, we present the cross-sectional regression results of the determinants of the share of idle land in 1915. The control variables include the distance to the Yangtze River, the distance to the coastline, and the dummy variables for whether a county was a prefecture capital seat, was considered a key county by the Qing government in 1820, and was a trade center in 1915.[38] We also control for the provincial fixed effects to hold constant province-specific features.

Based on the results, the idle land ratio in the Early Taiping areas is 3.6 percentage points

[38] We do not control for the distance to the Grand Canal because it did not pass through our sample counties here.

higher than that in the non-Taiping counties, while the idle land ratio in the Late Taiping areas is slightly higher but not statistically different from that in the non-Taiping counties. The lack of significant difference between the Late Taiping and non-Taiping counties in the share of idle land is suggestive: the reallocation of property rights between former landowners and tenants did not reduce long-term maintenance of or investment in land. This pattern supports the property rights hypothesis: relative to the Early Taiping area, the Late Taiping area had better protections for land property rights, and indeed, they had a lower share of idle land. Column (3) shows that the above results remain robust when controlling for (i) the distance to Nanjing (as a proxy of distance to a major metropolitan area in the region), and (ii) the *likin* intensity immediately after the Taiping Army's fall; both additional variables do not explain the idle land ratio.[39]

Did the Taiping land policies affect the long-term population growth? To answer this question, we estimate the following equation, modified from equation (1):

$$\ln(pop_{i,t}) = \sum_{\tau \neq 1820} \alpha_{1\tau} D_\tau * Early\ TP_i + \sum_{\tau \neq 1820} \alpha_{2\tau} D_\tau * Late\ TP_i + X'_{i,t}\beta + \sum_t \beta_t D_t Z_i + \rho_t + \eta_i + e_{i,t}. \quad (4)$$

In essence, equation (4) distinguishes between the Early and Late Taiping areas.[40] Other variables remain identical to those in equation (1). In column (1) of Table 5, we report the full sample OLS estimates for equation (4). In column (2), we report estimates of a SAR model using the full sample. In column (3), we report the OLS results using a matched sample. Since the results based on the matched sample are likely the most credible, we focus on column (3).

Based on the matched sample in column (3), compared to the control group, the Early Taiping areas experienced an *immediate* post-rebellion drop in the population growth rate by 30 percentage points (i.e., $1 - e^{-0.35}$), and a *further drop* of 8 log points after the Communist takeover in 1949 (see the coefficient on *Early Taiping*Year 1953*). This is consistent with the finding that poorer land property rights in the Early Taiping areas led to more idle land. The Early Taiping areas thus

[39] The results do not reflect any land reform efforts. Though the land reform was part of the ideology of the Xinhai Revolution of 1911, which overthrew the Qing dynasty and established the Republic of China, it was not implemented by the ruling Beiyang government (1912–1928) during the period of our idle land data. The subsequent Nationalist government (1928–1949) only enacted pilot land reforms in limited areas on the eve of the communist takeover.

[40] Here, we focus on the heterogeneity in the average population effect between the Early and Late Taiping regions. This is motivated by the fact that the Late Taiping region featured better land property rights, and it is a parsimonious characterization. There may exist further heterogeneity within the Early or Late Taiping group. For instance, Cao and Li (2000) study variation in population losses for prefectures within Zhejiang province, i.e., a province in the Late Taiping region. They document significant variation: Hangzhou and Huzhou prefectures had massive population losses after the rebellion, while Wenzhou prefecture even witnessed a slight increase in population. We do not pursue the further exploration of such within-Late-Taiping-region variation because we do not have a more granular measure for the exposure to the rebellion, and we are more interested in the rebellion's impacts on institutions and subsequent development than in population effects *per se*.

experienced a slower population recovery, with modest recovery not occurring until the latter half of the 20th century.

In contrast, the Late Taiping areas experienced a faster population recovery than the Early Taiping areas. While the Late Taiping areas experienced an initial drop in population growth by 32 percentage points ($1 - e^{-0.39}$) in 1880, in the long term, there is no significant gap in population growth between the Late Taiping and the control areas. This quick recovery in population growth could be explained by good land property rights in the Late Taiping areas, which led to faster re-utilization of idle land, and perhaps more migration. Both the results for idle land and the results here lend support to the land property rights hypothesis.

The results based on the full sample in columns (1) and (2) are overall consistent with the matched sample results. The patterns are the same for the Early Taiping regions. The results in column (1) suggest that the Late Taiping areas had a larger initial loss in population than the Early Taiping areas, but there was a faster recovery of population growth in the Late Taiping areas. The Late Taiping coefficients shrink over time, while the Early Taiping coefficients remain stable. The SAR estimates in column (2) are similar to the results based on the matched sample.

In the Appendices, we perform several robustness checks for the heterogeneous population effects. Panel B of Appendix Table B1 confirms that the adverse population effect is larger in Early Taiping areas. Columns (3) and (4) of Appendix Table C1 show that the distinction between Early and Late Taiping areas survives when accounting for the influence of the Taiping conquest. The results are not driven by spillovers between adjacent areas (columns (3) and (4) of Appendix Table D1). They are also robust to excluding the prefectures of a province that serve as the control, one province at a time (see Appendix Figure E1(b) for details).

V.2. The effects of the Taiping Rebellion on *likin*

A key change stemming from the rebellion was the adoption of *likin* for local taxes, a transformative change allowing local finance to become a significant force. To understand its origins, we now examine how the rebellion shaped the *likin* collection. We gather data on annual average provincial *likin* for the periods 1869–1879, 1880–1908, and 1922–1925, respectively. We set the *likin* revenue to be zero for periods before the Taiping Rebellion. In the end, we use a panel of 266 prefectures for four periods—one pre-rebellion period and three post-rebellion periods, i.e., 1869–1879, 1880–1908, and 1922–1925.

To examine whether the rebellion led to a higher *likin* intensity (i.e., *likin* revenue per thousand square kilometers, denoted by $likin_{it}$) in the Taiping areas, we run the following difference-in-differences regression:

$$\ln(1 + likin_{it}) = \sum_{t \neq \text{pre-rebellion}} \gamma_t (D_t \times Taiping_i) + d_t + \eta_i + e_{i,t} . \quad (5)$$

Here, D_t is the period dummy variable; $Taiping_i$ represents the Taiping dummy or the Early Taiping and the Late Taiping dummy variables. d_t and η_i are the year and the prefecture fixed effects. The standard errors are clustered at the provincial level. We perform statistical inference following the wild bootstrap-*t* procedure due to the small number of clusters (Cameron et al. 2008). Table 6 reports the results.

Two findings emerge. First, as shown in column (1), the *likin* intensity was substantially higher in the Taiping areas. In 1869–1879, the first post-rebellion period, the Taiping areas collected 12 times (i.e., $e^{2.5}$) as much *likin* as the control areas. Even in the period 1922–1925, seven decades after the introduction of *likin*, the *likin* intensity in the Taiping areas remained 3.7 times that of other areas. This suggests that the Taiping experience resulted in a permanent strengthening of local fiscal capacity. Second, column (2) shows that the *likin* intensity is much higher in the Late Taiping areas than in the Early Taiping areas. When compared to the control areas, the *likin* intensity in the Early Taiping areas was higher by a factor of 9.0 in 1869–1879 and by a factor of 2.7 in 1922–1925. By contrast, relative to control areas, Late Taiping areas on average had a higher *likin* intensity by a factor of 22.2 and 6.1 in respective periods. The results in columns (3) and (4) are based upon the matched sample, and they reveal similar patterns. These findings support the conditional *likin*-as-fiscal-capacity hypothesis that the rebellion contributes positively to local fiscal capacity.

In the Appendices, we provide several robustness for the effects of the Taiping Rebellion on the rise of *likin*. We show that the results are robust to (i) controlling for other historical events (Panel C of Appendix Table B1); (ii) accounting for the influence of the Taiping Army's conquest (columns (5) and (6) of Appendix Table C1); (iii) accounting for spillovers between adjacent areas (columns (5) and (6) of Appendix Table D1); and (iv) excluding the prefectures of a province that serve as the control, one province at a time (see Appendix Figure E1(c) for details).

VI. The Impact of the Taiping Rebellion on Social Capacity

As discussed in Section II.4, the number of charity organizations—an indicator of social capacity—increased significantly after the rebellion. Given the potential importance of social capacity for development, we now examine how the rebellion affected the development of charity organizations. Table 7 presents the impact of the rebellion on the total number of charities in a prefecture. All the control variables are the same as in the baseline population regression, equation (1). 1820 is the omitted reference year. We report both full-sample and matched-sample results.

Column (1) shows that the rebellion on average was not significantly associated with charity organizations in post-rebellion years. However, this result masks important heterogeneity. In

column (2), when we distinguish between the Early and the Late Taiping areas, we find divergent social development. In all the post-rebellion years, the Early Taiping areas did not exhibit a differential trajectory in the development of charity organizations compared to control areas. By contrast, the Late Taiping areas had experienced a significant rise in the number of charity organizations established after the rebellion. Before the rebellion, the Late Taiping areas already exhibited moderately faster growth of charity organizations than the control areas. Nonetheless, immediately after the rebellion (i.e., 1880), the growth of charities in the Late Taiping areas was substantially higher than in control areas by 56 percentage points (i.e., 44 log points). This advantage in the growth of charity organizations in the Late Taiping prefectures grew to around 78 percentage points (i.e., 58 log points) by the end of the first half of the 20th century. Columns (3) and (4) report the matched sample results. Again, the effects of the rebellion on charities are significant and substantial only for the Late Taiping areas. In sum, the Taiping Rebellion facilitated growth in charity organizations in the Late Taiping areas, supporting the social change hypothesis.

We conduct similar robustness checks as before in the Appendices. We show that the results are robust to (i) controlling for other historical events (Panel D of Appendix Table B1);[41] (ii) accounting for the influence of the Taiping Army's conquest (columns (7) and (8) of Appendix Table C1); (iii) accounting for spillovers between adjacent areas (columns (7) and (8) of Appendix Table D1); and (iv) excluding the areas of a province that serve as the control, one province at a time (see Appendix Figure E1(c) for details).

VII. The Long-Term Consequences of the Taiping Rebellion

We have established that despite the tragic consequences on population, the Taiping Rebellion ushered in important institutional changes, especially in the Late Taiping areas, including (i) better land property rights, (ii) stronger fiscal capacity, and (iii) the rise of social capacity. These institutional changes are important building blocks of long-term economic and social development. Therefore, in this section, we explore the long-term consequences of the Taiping Rebellion.

We gather various data sources for our investigation. The details on measurements can be found in Section III and Appendix Table A2. For consistency, we harmonize the geographic units of different datasets with the geographic units in 1820. Our main dataset covers 191 (Qing) prefectures. We compare the long-term performance between Taiping and control areas using cross-sectional regressions. We also perform various robustness checks.

[41] An important control variable is missionary activities in late Qing, which may relate to the development of charity organizations.

VII.1. The Taiping Rebellion and long-term development outcomes

We start by examining how the rebellion experience is associated with a range of development outcomes, capturing economic activity, human capital, and fiscal revenue. In Panel A of Table 8, we characterize the rebellion experience simply using a dummy variable, and we regress the development outcome on the rebellion dummy, controlling for the same variables as before.[42] We report OLS estimates based upon the full sample. Later, we will present several robustness checks for our results.

As shown in Panel A of Table 8, Taiping prefectures, on average, perform similarly to the control prefectures in terms of population, educational attainment, and GDP per capita in 2010. However, compared to control prefectures, Taiping prefectures had a 27 percent (24 log points) higher per capita agricultural and industrial output in 1982, and a 51 percent (41 log points) higher per capita fiscal revenue in 2010. We have also performed 2SLS estimations (unreported) where the Taiping dummy is instrumented by the longitude as before, and we also find largely insignificant differences between the Taiping prefectures and the comparable control prefectures.

In Panel B, we further distinguish between the Early Taiping and the Late Taiping prefectures. Recall that the Late Taiping regions had better land property rights during and after the rebellion. Now, in the longer run, Late Taiping prefectures exhibit much better performance than Early Taiping prefectures. Early Taiping prefectures' outcomes are not statistically distinguishable from those of control prefectures. In stark contrast, the better performance of Taiping prefectures found in Panel A is driven by Late Taiping prefectures: Late Taiping prefectures have an agricultural and industrial output per capita in 1982 that was 90 percent higher (64 log points) than control prefectures, and the fiscal revenue per capita in 2010 was 203 percent higher (111 log points). In addition, the GDP per capita in 2010 was 87 percent (63 log points) higher in Late Taiping prefectures. In terms of human capital, Late Taiping prefectures also had more middle school graduates in 1982, though there were no significant differences in the literacy rate in 1982 and the average years of schooling in 2000. The strong advantage of the Late Taiping areas relative to the Early Taiping areas is consistent with the property rights hypothesis.[43]

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[42] Except that the cross-sectional nature of the data here does not allow for the prefecture fixed effects, and that the interactions between the time dummies and the time-invariant variables previously are replaced here with the time-invariant variables.

[43] There are two ways in which property rights could generate lasting impacts during and immediately after the rebellion. First, it could work via the persistence of property rights (to this day). Second, it could work via the income effects: better property rights after the rebellion led to higher subsequent income, which might generate other beneficial effects such as higher local state capacity, better local infrastructure, better education, among others. In unreported results, we link a measure of firms' perceived property rights protection from the World Bank Enterprise Survey for 120 cities in 2005 with the Early Taiping and the Late Taiping regimes (along with

VII.2. The roles of local fiscal capacity and social capacity

We now explore the roles of rebellion-induced changes in local fiscal capacity and social capacity. To do so, in Panel C of Table 8, we include the *likin* intensity of 1880 and the average number of charities from 1880–1941 in the regressions.[44] Note that both *likin* and charities are the endogenous outcomes of the Taiping Rebellion, thus, one needs to interpret these results with caution (Angrist and Pischke 2009; Imai et al. 2011).[45] Due to the lack of additional sources of exogenous variation in *likin* and charities, we use this approach to describe in the data how *likin* and charities are *associated* with development outcomes and how they mediate the impacts of the Taiping Rebellion, as in existing economics literature (e.g., Banerjee and Iyer 2005; Cutler and Lleras-Muney 2010; Bai and Kung 2015; Bo et al. 2023).

We find that a high post-rebellion *likin* intensity relates to better long-term human capital development. Specifically, as shown in columns (2) to (6), a one standard deviation (i.e., 2.8) increase in post-rebellion *likin* intensity is associated with a 1.7 percentage points higher middle school completion rate, a 4.8 percentage points higher literacy rate, and a 5.3 percent higher level of schooling. In addition, a one standard deviation increase in the *likin* intensity is associated with a 12.2 percent (11.5 log points) higher level of GDP per capita in 2010. These patterns suggest that stronger fiscal capacity developed a century ago is associated with better provisions of public goods and contributes to economic activity in modern days.

We also find suggestive evidence, from columns (1), (4), and (5), that charities are positively associated with modern economic activity and fiscal revenue. A one standard deviation increase in the charity variable (i.e., 1.4) is associated with a 15 percent (or 14 log points) increase in agricultural and industrial output per capita in 1982, a 20 percent (or 18 log points) increase in GDP per capita in 2010, and a 55 percent (or 44 log points) increase in fiscal revenue per capita in 2010.

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some basic controls as in Table 8), and we do not find any significant association. Given this, we conclude that the Taiping-era property rights likely affected modern outcomes via the income effects rather than the persistence of property rights.

[44] We use the average to capture the full impact of the social changes associated with charity organizations for the post-rebellion years as of the communist takeover in China. We use the end year of 1941 for our calculation because it is the last year of our charity data and close to 1949 when the People's Republic of China was founded.

[45] Angrist and Pischke (2009) point out that variables that are outcomes of a treatment are typically "bad controls" for a regression of another outcome on the treatment; they may lead to biased estimates unless strong exogeneity assumptions are imposed. Closely related to our exercise, Imai et al. (2011) discuss this issue from a perspective of causal mediation that aims to formally quantify the importance of a mechanism. They show that under an exogeneity assumption of the mechanism, controlling for a mechanism variable in a regression can identify (i) the direct treatment effect not mediated by the mechanism (measured by the treatment coefficient) and (ii) the indirect treatment effect mediated by the mechanism (measured by the change in the treatment coefficient after controlling for the mechanism variable). In our case, the coefficient on the Taiping dummy reflects the effect of the Taiping Rebellion via channels other than *likin* and charities, possibly property rights, while the change in the coefficient on the Taiping dummy reflects the effect of the Taiping Rebellion via channels of *likin* and charities.

These results shed light on the *likin*-as-fiscal-capacity hypothesis and the social change hypothesis. They suggest that the Taiping Rebellion could facilitate long-term development, given that it boosted local fiscal capacity and social capacity (cf. Section V and Section VI). Moreover, if we compare estimates in Panel C to (unreported) estimates from regressions that leave out the charity variable but retain other variables, we find that once netting out the effects of social capacity, Late Taiping prefectures' advantages in gross agricultural-and-industrial output, GDP, and in fiscal revenue are significantly attenuated—by about 17 percent, 14 percent, and 22 percent, respectively. These quantities should be interpreted with caution due to the endogeneity issues of *likin* and charities mentioned in the beginning of this section. Nonetheless, qualitatively, this pattern suggests the importance of the rebellion-induced social change in rendering the Late Taiping prefectures' advantages in long-term development.[46]

VII.3. Robustness checks

In Sections VII.1 and VII.2, we have shown that the experience of the Taiping Rebellion, in particular, the experience of the Late Taiping rule, is associated with more favorable long-term development outcomes. Our preferred interpretation is that these associations reflect the lasting influences of rebellion-induced institutional changes on the fronts of property rights, fiscal capacity, and social capacity. One concern is that the results may be driven by confounders over a long period of time that are not adequately controlled for. To alleviate this concern, we conduct several robustness checks that reduce the influence of confounders. The results of these checks strengthen—though do not prove—the conclusion of the lasting impacts of the Taiping Rebellion.

First, we find similar patterns when using a SAR model that considers spatial interactions (see Table A5). Second, we show that the results remain robust when using a matching estimator that compares observationally similar Taiping and control prefectures (see Table A6). Third, we show that our results are robust to controlling for a range of historical events that may correlate with the experience of the Taiping Rebellion and/or affect long-term development (see Table B2). We

[46] Wang (2022) suggests that the social terrain, i.e., how *central* elites connect local social groups, have important implications for state capacity at the national level, development of local private-order institutions (e.g., lineage organizations), as well as the provision of local public goods; as such, social capacity and social structure affect long-term development of a country. We have tried to examine how Wang (2022)'s insight on the importance of genealogy books (as a measure for the strength of lineage organizations) relates to our conclusion on the importance of social capacity (here, measured by charity organizations) on long-term development. We find that our conclusion on the importance of social capacity remains robust if we control for local genealogy books (using the database constructed by Wang (2020)). We interpret genealogy books as a proxy for a specific type of social capital, say, in-group social capital, whereas charity organizations tend to proxy for the social capital pertinent to a broad group of individuals in a community. Our findings seem to suggest that indeed, genealogy books (or lineage organizations) had some effect on development in the medium term, but the effect is much weaker than that of charity organizations in the long term (results available upon request).

consider historical events that we have additionally controlled for in Section IV.5 (e.g., the Guangxu Drought, the Nian Rebellion, missionary activities, and key wars in late Qing and Republican China). In addition, we control for the influence of the Cultural Revolution (1966–1976), given its importance in China's modern history (Walder 2014; Bai and Wu 2023).

Last but not least, we present results showing that the experience of Taiping rule, especially that of the Late Taiping rule, is associated with stronger economic development even in the *"intermediate" term*, where unobserved factors that could have explained the aforementioned long-term results would play a more minor role. We study China's early industrialization by the 1930s. We use county-level data for the Taiping provinces (Anhui, Jinagxi, Hubei, Jiangsu, and Zhejiang), which include 138 Early Taiping counties, 86 Late Taiping counties, and 132 control counties (see Section III for description of the data). The main outcome variable of interest is firm entry, measured by the number of industrial firms established between 1858–1937 (plus one and logged). We regress firm entry on the Taiping dummy, province fixed effects, and covariates. We include the covariates used in the idle land regressions (see Table 4) and a variable on local military investment during the Self-Strengthening Movement (1861–1895) in late Qing, which may affect local industrialization (Bo et al. 2023). Columns (1)–(3) of Table 9 report the results.

Column (1) shows that the Taiping counties witnessed more firm entry from 1858–1937 than control counties. Column (2) implies that Taiping counties' advantages are driven by Late Taiping counties, and Early Taiping counties in fact exhibit some disadvantages.[47] In column (3), we find that the average post-rebellion level of charities is strongly associated with firm entry, and controlling for charities accounts for part of Late Taiping counties' advantages and accentuates Early Taiping counties' disadvantages. We find similar patterns when studying local industrial production value in 1933 (see columns (4)–(6)). These results for early industrialization echo the results for modern economic activity and fiscal revenue, highlighting the rebellion's positive impacts on development, in particular, through the social capacity channel.

VII.4. The Taiping Rebellion and contemporary social cohesion and civic engagement

Thus far, we have offered evidence on the important roles played by social capacity, as captured by

[47] In Table A8, we explore the temporal heterogeneity of this result. Specifically, we calculate the number of entrants before and after 1895, the year when the Treaty of Shimonoseki was signed between Qing China and Japan. The treaty allowed foreign firms to enter China, and meanwhile, the Qing government lifted its restrictions on private industrial firms (Bo et al. 2023). Table A9 shows that there is a null association between Early/Late Taiping rule and firm entry before 1895. However, after 1895, when the business environment permitted, Late Taiping counties witnessed a higher level of firm entry compared to control counties, while Early Taiping counties actually had fewer entrants. These patterns assure that there are no "pre-trends" where Taiping counties were already on different trajectories of industrial development than control counties. They also highlight the important role played by the Late Taiping rule.

charity organizations, in shaping long-term development. We now investigate how the rebellion affects modern-day social cohesion and civic engagement, as discussed in Section II.4.

Attitudinal and behavioral outcomes. We first employ the China General Social Survey (CGSS hereafter) in 2010 for measures of social cohesion and civic engagement. CGSS is a nationally representative survey that collects rich information on people's attitudes and behaviors.[48] As before, we match modern prefectures in the CGSS with Qing prefectures of 1820 for the status of the Taiping Rebellion and other historical variables. We are able to link 69 modern prefectures to 67 Qing prefectures. In all regressions, we include the same set of baseline prefecture-level controls as well as individual-level covariates, including gender, birth cohorts, educational attainment, urban residence status, marital status, employment status, and the Communist Party membership. Standard errors are clustered at the prefecture level, the same as the level of variation in the Taiping treatment.

Social cohesion is measured by interpersonal trust. The CGSS asks a respondent to rate their trust in different subjects on a scale of 1–5. Columns (1) to (3) of Table 10 present results for the associations between the Taiping Rebellion and trust attitudes. Based on Panel A, people in the Taiping prefectures exhibit higher trust in people of their personal network (relatives, friends, and coworkers) than people in the non-Taiping prefectures. Panel B further shows that higher trust in personal networks largely appears only in the Late Taiping prefectures. These results are consistent with the following notion: The Late Taiping areas featured strong social cohesion (led by local gentry) during the fight against the Taiping rebels and the post-rebellion reconstruction, which strengthened trust in local networks then and afterwards.[49]

We now examine how the rebellion affects civic engagement, which is deemed critical to good governance for its role in facilitating checks and balances on the government (Campante and Chor 2012; Campante and Do 2014). This can be especially important in the Chinese context, given that the Confucian tradition discourages civic engagement (Acemoglu and Robinson 2019; Huntington 1991; Shirley and Xu, 2025). We use two measures for civic engagement. The first one is *attention to politics*, which is a binary outcome that equals one if the respondent routinely follows political news. This measure captures individuals' interest in politics and acquisition of political information. In the sample, about 34 percent of respondents report that they pay attention to politics, which is the prerequisite of effective civic engagement. The second one is *engagement in local affairs*. We

[48] The same dataset has also been used by Xue (2021) to study the long-run impact of state repression on trust.
[49] To understand whether the Taiping Rebellion exerts effects through the channel of social capital, we run regressions that additionally include charities (results available upon request). However, we do not find significant effects of charity organizations. The results suggest that the rebellion affects current social trust and local cooperation independent of the social capital (i.e., charity) channel.

gauge this aspect to be present when a respondent reports that she/he has engaged in local affairs (e.g., volunteering, petitions, and demonstrations). In the sample, only 18 percent of respondents report that they have ever participated in local affairs. Columns (4) and (5) of Table 10 report the results. In Panel A, the experience of the Taiping Rebellion does not have discernible associations with people's attention to politics and engagement in local affairs. If we distinguish between Early and Late Taiping prefectures, as in Panel B, we see that Late Taiping regions feature significantly higher levels of attention to politics and participatory behavior.

The above results should be considered as suggestive due to the possibilities of other uncontrolled shocks that may shape social cohesion and civic engagement. As a robustness check, Table B3 shows that the results survive controlling for the same set of historical events as before as well as the Cultural Revolution—the literature has documented that the Cultural Revolution has a persistent impact on trust attitudes (Bai and Wu 2020; Wang 2001).

Severity of the Great Chinese Famine (1959–1961). China's long history as a unified country has been marked by various historical catastrophes. Surviving them tested the resilience of the country and its people. How did the rebellion experience potentially affect responses to the Great Chinese Famine (1959–1961)? The changes induced by the Taiping Rebellion may have made some regions better equipped to respond to this catastrophe that occurred a century later.

The Great Famine was one of the deadliest famines in human history, with a death toll that has been estimated to be between 16 and 45 million (Coale 1981; Dikötter 2010; Li and Yang, 2005). Previous studies suggest that this famine was a consequence of multiple institutional failures during the Great Leap Forward (GLF, 1958–1962), which resulted in a decline in agricultural production and the over-procurement of grain in rural areas (Li and Yang 2005; Meng, Qian, and Yared 2015; Kasahara and Li 2020). Political radicalism was a key factor behind the institutional failures, as demonstrated by the pronounced inverse relationship between party membership density (PMD) and death rates during the famine. The common interpretation is that a *lower* PMD was reflective of a shorter revolutionary history and weaker alignment with the communist regime, so local officials were eager to advance their political careers by signaling their loyalty and enforcing the GLF policies *more* radically (Yang 1996). The experience of the Taiping Rebellion may have helped to mitigate the fatal effect of political radicalism in select Taiping areas. In Taiping areas with a higher level of social capital, local officials may have been more sympathetic to local communities and may have pursued less radical policies, despite career incentives; furthermore local populations may have been better able to act collectively to resist radical policies (Cao, Xu, and Zhang 2022;

Hu, Yao, and You 2023; Chen 2010; Fang et al., 2023).[50] We thus compare famine severity between Taiping and non-Taiping areas and explore the potential role of social capital in containing the harm of political radicalism under central planning.

To measure famine severity at the local level, we follow Meng, Qian, and Yared (2015) to proxy the relative size of famine survivors in rural areas. The underlying idea is that "famine increases infant and early childhood mortality rates and lowers fertility rates such that a more severe famine results in smaller cohort sizes for those born shortly before or during the famine." Accordingly, following Fang et al. (2023), we construct a variable *"famine control"* to measure local famine severity. It is the ratio of the size of cohorts born during the famine period (1959–1961) relative to the size of cohorts born during the pre-famine period (1954–1957), as observed in the one percent sample of the 1990 population census:[51]

$$\text{Famine Control}_i = \frac{\text{Size of cohorts born in 1959–1961, prefecture } i}{\text{Size of cohorts born in 1954–1957, prefecture } i}. \quad (6)$$

A *higher* value of Famine Control_i means that the famine was *less* severe in prefecture i. An x unit increase in Famine Control_i can be interpreted as a $100x$ percent increase in the size of famine survivors, relative to those born during the pre-famine period.

Table 11 presents how the Taiping Rebellion affected famine severity in a prefecture. From column (1), the famine was significantly less severe in the Taiping areas. Specifically, the Taiping areas had a 6.9 percent larger size of survivors than the non-Taiping areas. In column (2), though the Taiping Rebellion's positive legacy is present in both early and Late Taiping areas, it is 28 percent stronger in the Late Taiping areas (i.e., 8.4 vs. 6.5 percent). To put the effect in perspective, consider the following back-of-the-envelope calculations. An average prefecture in our sample had 373,500 people born in 1954–1957 cohorts and 185,200 people born in 1959–1961 cohorts. Thus, based on our estimates, the Late Taiping experience would have saved $0.084 \times 373{,}500 = 31{,}374$ people, while the Early Taiping experience would have saved $0.065 \times 373{,}500 = 24{,}145$ people. These are sizeable effects: the Late (Early) Taiping effect amounts to 17 (13) percent of the size of 1959–1961 cohorts. In column (3), we further control for the measure of political radicalism, the

[50] There has been some evidence corroborating these possibilities. On policy enforcement, Cao, Xu, and Zhang (2022) find that social capital, measured by kinship-based clan density, reduces famine severity, and they show that provinces with higher clan densities had lower excessive grain procurement rates. Similarly, Hu, Yao, and You (2023) find that officials governing their home counties, which they had social ties with, implemented procurement more flexibly preceding the famine and expended more on social programs such as disaster relief during the GLF. When it comes to collective acts of resistance, Chen (2010)'s interviews with peasants in Anhui province report that resistance was more likely in the presence of dense local kinship networks.

[51] Constructed using the population census, Famine Control_i is less vulnerable to misreporting because it is less influenced by the government's desire to understate famine severity. In other studies of the Great Chinese Famine (Kasahara and Li 2020; Chen and Yang 2015), scholars have constructed alternative measures of famine severity using the 1990 census, which use different benchmarks to scale the size of famine survivors but are otherwise in the same spirit as the measure used here. In Table A8, we show that our results are robust to alternative measures.

reverse party member density (-1*PMD) of a province. The coefficient on -1*PMD is not precisely estimated, however, the negative sign is consistent with Yang (1996) who argues that a lower PMD represents a shallower communist revolutionary history in a province so that officials there implemented more radical grain procurement to show political loyalty, which resulted in more deaths in the famine. The inclusion of this variable does not markedly change the association between the rebellion experience and famine severity, and the Late Taiping rule again exhibits a larger effect on reducing famine severity. These results hold even if controlling for other historical events (see Table B4). The SAR model and matching approach give similar results (see Table A9), and if anything, the effect of the Late Taiping rule on famine severity is even more pronounced.

Taken together, the results suggest that the Taiping Rebellion, one of the bloodiest wars in history, helped mitigate the harm of another tragedy that happened a century later, and this mitigation effect was stronger in the Late Taiping areas that had developed stronger social capital.

VIII. Conclusions

The sharp drop in population during and after the Taiping Rebellion was comparable to what Europe experienced following the Black Death (Voigtlander and Voth 2009, 2013a, 2013b; Jebwab, Johnson, and Koyama 2022), and it marked a key turning point in China's millennium of history (Wang 2023), but the rebellion's consequences are not well understood. In this paper, we offer evidence that the Taiping Rebellion indeed had disastrous immediate consequences in terms of population losses, and the losses became permanent in some affected regions, but not in all. Moreover, the rebellion led to important institutional, fiscal, and social changes that facilitated long-term development in a *subset* of the Taiping regions—namely, the Late Taiping regions—which were characterized by stronger post-rebellion property rights, enhanced local fiscal capacity, and growth in local charities. Such developmental impacts are reflected in modern income levels, early industrialization, fiscal capacity, and human capital. The Late Taiping regions also feature stronger trust in one's social network, stronger civic participation, as well as more resilience during the Great Famine, one century after the rebellion. These findings are consistent with several hypotheses in the literature that examine the long-term impacts of war on state capacity: specifically, property rights can facilitate long-term development; wars often contribute to the development of state capacity; and social capacity benefits long-term development.

The Taiping Rebellion was a crucial juncture in Chinese history, as it marked the onset of fiscal decentralization, a drastic rise in political and social participation by local elites, and the beginning of China's modernization drive. Since then, China has continued to grapple with the tension between centralization and decentralization. While decentralization helped the Qing dynasty surive

the Taiping Rebellion, it might have also contributed to Qing's eventual collapse (Sng 2014; Koyama, Moriguchi, and Sng 2018).[52] After the founding of the Republic of China in 1912, the central government remained weak, and a decade of complete decentralization ensued, characterized by a segmented China ruled by warlords. Chiang Kai-shek's Nationalist government attempted to reassert centralization but ultimately failed in mainland China. Beginning with the reform of 1978, the Chinese government attempted a strong decentralization drive through the mid-1990s, and then reversed that trend by moving towards fiscal centralization, which had greatly strengthened central state capacity. China's journey from the Qing Dynasty to the present could be characterized as a transition from a weak state with a weak society to a strong state with a still weak society. The evidence presented in our paper demonstrates that stronger social capacity can generate substantial long-term benefits. In particular, given China's enormous state capacity today, cultivating civil society and strengthening social capacity would likely yield enormous payoffs for the country.

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[52] According to Sng (2014) and Koyama, Moriguchi, and Sng (2018), Japan's overtaking of China in the process of confronting the threat posed by the Western powers was likely due to its successful centralization drive, which was made possible by its smaller territorial size relative to that of China. The balance between centralization and decentralization is thus a key parameter of governance that has crucially shaped the development trajectories of these two key East Asian countries.

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Figures

Figure 1. Illustration of the Hypotheses

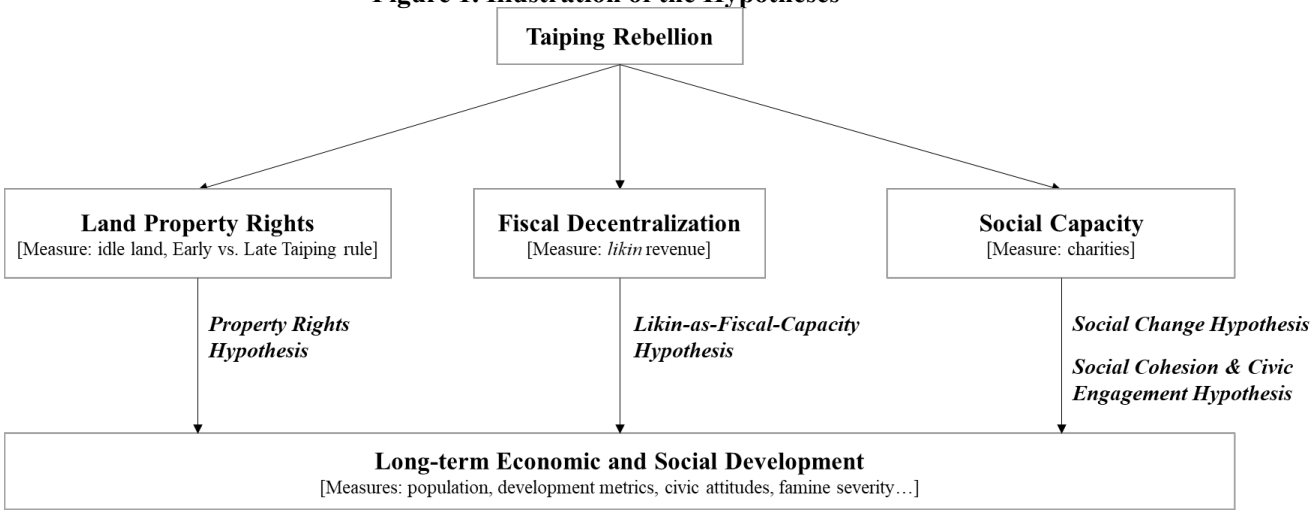
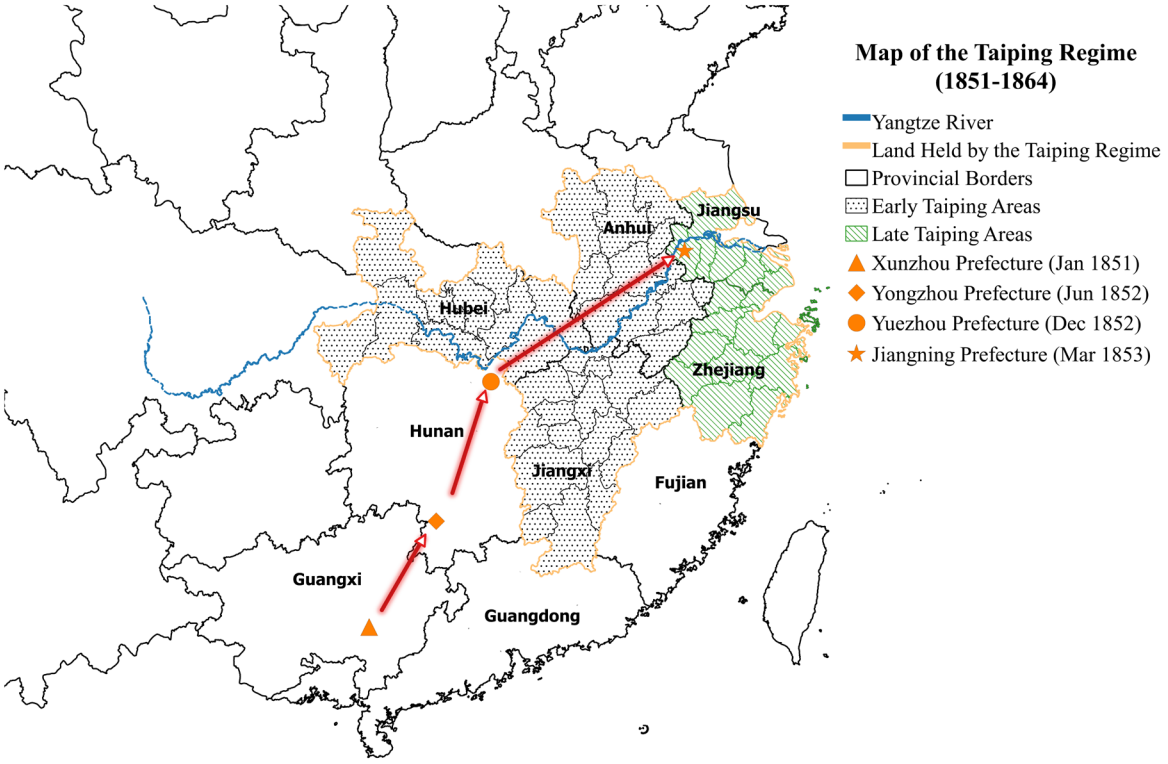
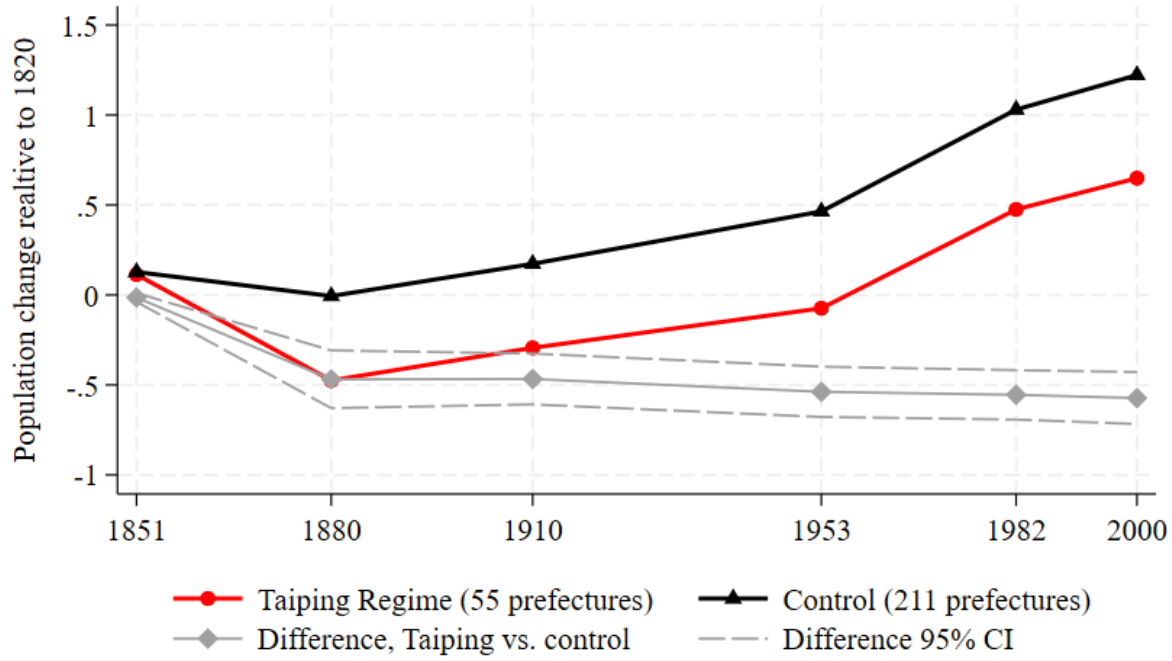


Figure 2. Map of the Taiping Areas (1851-1864)



Note: The Taiping Rebellion broke out in Xunzhou prefecture, Guangxi in January 1851. Then, the Taiping Army marched along the arrow to the northeast, and ultimately captured Jiangning prefecture, Jiangsu in March 1853. In the figure, the shaded areas refer to land occupied by the Taiping regime. We distinguish between Early and Late Taiping areas. The former are the areas that the Taiping regime occupied at the early stage in Jiangxi, Hubei, and Anhui provinces, while the latter are the areas that the Taiping regime occupied at the late stage in Jiangsu and Zhejiang provinces.

Figure 3. Population Change Population Over Time for Taiping Regime Prefectures



Note: Population change in year t = ln (Population in year t / Population in 1820). The Taiping Regime group covers 55 prefectures which were under Taping jurisdiction, while the control group covers 211 prefectures which were never under Taping jurisdiction.

Tables

Table 1. Population Changes for Taiping and Non-Taiping Prefectures

	Control	Treatment					
		Taiping		Early Taiping		Late Taiping	
	Mean	Mean	Difference	Mean	Difference	Mean	Difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Population Growth in 1820-1851	0.128	0.114	-0.014	0.123	-0.004	0.094	-0.034
	(0.092)	(0.079)	(0.014)	(0.042)	(0.015)	(0.125)	(0.023)
Population Growth in 1820-1880	-0.006	-0.475	-0.469***	-0.412	-0.406***	-0.605	-0.598***
	(0.526)	(0.547)	(0.080)	(0.572)	(0.095)	(0.480)	(0.128)
Population Growth in 1820-1910	0.173	-0.294	-0.467***	-0.226	-0.399***	-0.433	-0.606***
	(0.524)	(0.465)	(0.078)	(0.489)	(0.093)	(0.388)	(0.126)
Population Growth in 1820-1953	0.464	-0.074	-0.538***	-0.059	-0.523***	-0.104	-0.569***
	(0.456)	(0.476)	(0.070)	(0.506)	(0.083)	(0.422)	(0.111)
Population Growth in 1820-1982	1.030	0.475	-0.555***	0.532	-0.498***	0.358	-0.672***
	(0.452)	(0.467)	(0.069)	(0.477)	(0.081)	(0.436)	(0.111)
Population Growth in 1820-2000	1.222	0.649	-0.573***	0.704	-0.518***	0.537	-0.685***
	(0.452)	(0.498)	(0.070)	(0.508)	(0.082)	(0.469)	(0.111)
Population in 1820 (Baseline)	4.311	5.231	0.920***	5.051	0.740***	5.602	1.291***
	(1.057)	(0.690)	(0.150)	(0.692)	(0.180)	(0.532)	(0.252)
Longitude	110.155	117.126	6.971***	115.635	5.481***	120.189	10.03***
	(5.415)	(2.954)	(0.759)	(2.408)	(0.907)	(0.814)	(1.280)
Observations	211	55		37		18	

Note: Population Growth in year t = ln (Population in year t / Population in 1820). The control group covers 211 prefectures not in the Taiping jurisdiction. The Taiping group includes 55 prefectures under the Taiping rule. The Early Taiping group includes 37 prefectures that the Taiping regime occupied in Anhui, Jiangxi, and Hubei provinces. The Late Taiping group includes 18 prefectures that the Taiping regime occupied in Jiangsu and Zhejiang provinces. Standard errors are in parentheses. The differences indicate the mean differences between a pertinent treatment group and the control group.

Table 2. Balance Tests for Covariates

	Mean			*t*-test	
Variable	Control	Taiping	% Bias	|*t*|	*p*-value
Distance to Grand Canal (log)	12.965	12.638	7.700	2.090	0.038
Distance to East Coast (log)	12.507	12.360	3.500	0.730	0.466
Chong Dummy	0.582	0.545	13.200	0.540	0.589
Fan Dummy	0.882	0.845	11.500	0.780	0.434
Pi Dummy	0.373	0.264	49.600	1.740	0.083
Nan Dummy	0.764	0.673	30.300	1.500	0.135
Tea prefecture Dummy	0.591	0.536	20.100	0.810	0.417
Silk prefecture Dummy	0.045	0.036	6.400	0.340	0.735
Num. of neighboring provinces	1.127	1.054	8.800	0.590	0.555
Tax per mu in 1820	0.080	0.067	34.100	1.440	0.151
War frequency 1776-1820 per capita	0.081	0.126	-47.300	3.430	0.001
Num. of *jinshi* 1893-1820 per capita	0.003	0.006	-5.600	1.290	0.197

Notes: This table presents balance tests for covariates after implementing the propensity score matching method. The control group includes 110 prefectures, and the Taiping group includes 19 prefectures.

Table 3. Baseline and 2SLS Estimation

	Dependent variable: log population size							
	(1) FS	(2) FS	(3) FS	(4) F-HWC	(5) FS w/ *Jinshi*	(6) FS-SAR	(7) PSM	(8) FS 2SLS
	Taiping	Taiping* log(No. of Battles)	Taiping* log(Duration)	Taiping	Taiping	Taiping	Taiping	Taiping
Taiping*Year 1851	-0.004	-0.010	-0.001	-0.004	-0.003	0.015	-0.007	-0.149
	[0.020]	[0.017]	[0.004]	[0.020]	[0.020]	[0.071]	[0.023]	[0.248]
Taiping*Year 1880	-0.454***	-0.394***	-0.113***	-0.434***	-0.450***	-0.205***	-0.355***	-0.818***
	[0.093]	[0.066]	[0.016]	[0.095]	[0.094]	[0.072]	[0.111]	[0.231]
Taiping*Year 1910	-0.438***	-0.369***	-0.103***	-0.416***	-0.435***	-0.187***	-0.341***	-0.849***
	[0.091]	[0.064]	[0.016]	[0.093]	[0.092]	[0.072]	[0.118]	[0.219]
Taiping*Year 1953	-0.513***	-0.430***	-0.113***	-0.497***	-0.513***	-0.225***	-0.375***	-1.189***
	[0.095]	[0.066]	[0.017]	[0.096]	[0.094]	[0.072]	[0.127]	[0.224]
Taiping*Year 1982	-0.443***	-0.384***	-0.100***	-0.425***	-0.444***	-0.181**	-0.316***	-1.080***
	[0.086]	[0.060]	[0.015]	[0.086]	[0.085]	[0.072]	[0.120]	[0.230]
Taiping*Year 2000	-0.428***	-0.388***	-0.099***	-0.415***	-0.428***	-0.161**	-0.303**	-1.200***
	[0.091]	[0.062]	[0.016]	[0.091]	[0.090]	[0.072]	[0.122]	[0.245]
War frequency	0.002	0.005	0.006	0.003	0.004	0.015	-0.017	0.014**
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.071]	[0.013]	[0.006]
Jinshi					0.002			
					[0.001]			
Observations	1862	1862	1862	1820	1862	1862	945	1862
R-squared	0.794	0.799	0.804	0.796	0.795	0.152	0.960	0.772
Number of prefectures	266	266	266	260	266	266	135	266
CD test: population (in logs)	396.468	396.468	396.468	396.468	396.468			
CD test: residuals	11.710	11.706	11.435	11.610	11.690			
rho						2.025***		
						[0.112]		
lambda						2.276***		
						[0.020]		
log likelihood						2.025***		
Kleibergen-Paap rk Wald F-stat.								21.226
Control	Y	Y	Y	Y	Y	Y	Y	Y
Cluster at prefecture level	Y	Y	Y	Y	Y	Y	Y	N
Jinshi	N	N	N	N	Y	N	N	N
Prefecture FE, year FE	Y	Y	Y	Y	Y	Y	Y	Y

Note: FS is a prefecture-year panel dataset for 266 prefectures in seven years (1820 and six years presented in the table). F-HWC is a prefecture-year panel for 260 prefectures (excluding 6 prefectures—Wuchang, Anqing, Songjiang, Jiangning, Suzhou, and Hangzhou—which were heavily affected by the fighting in the Taiping Rebellion). PSM is a prefecture-year panel for 135 prefectures, obtained through the propensity score matching method. The control variables include time-varying variables are time-invariant variables (interacted with period indicators). The time-varying variables are the distance to Yangtze River, to the coastline, and to the Grand Canal; the duration of treaty ports; the durations of concessions and leased territories; and the frequency of wars since 1776. Time-invariant variables are the number of neighboring provinces, the level of land taxes per unit of land; the total number of palace scholars (*jinshi*) from 1793–1820, indicators for silk- and tea-producing prefectures, and indicators of the four post designations classified by the Qing government in 1820. Column (5) additionally controls for the time-varying number of palace scholars (*jinshi*) in a prefecture over the preceding period. All columns are linear regression models estimated using OLS, except Column (6), which is a SAR model, and Column (8), which uses 2SLS. Only the estimation results for the key variables are reported. Standard errors are robust and clustered at the prefecture level; for the 2SLS estimation, the standard errors are robust.

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

Table 4. Taiping and the Percentage of Idle Land in 1915

Panel A. The distribution of counties in the control, Early, and Late Taiping areas				
	Taiping		Control	Total
	Early Taiping	Late Taiping		
Anhui	49		8	57
Jiangxi	64		14	78
Hubei	38		26	64
Jiangsu		27	31	58
Zhejiang		68	7	75
Total number of counties	151	95	86	332
Panel B. Determinants of the percentage of idle land in 1915				
	(1)	(2)		(3)
Taiping	2.710**			
	[1.034]			
Early Taiping		3.555***		3.855***
		[1.278]		[1.327]
Late Taiping		1.26		1.692
		[1.437]		[1.493]
Standardized ln(distance to Nanning)				-1.519
				[1.252]
Initial Likin				-1.025
				[0.701]
Observations	332	332		332
R-squared	0.108	0.11		0.079
Control	Y	Y		Y
Province fixed effect	Y	Y		N

Note: The sample consists of cross-sectional county-level data from 1915, covering 151 Early Taiping counties, 95 Late Taiping counties, and 86 control counties. The control variables include the distance to the Yangtze River and to the coastline, the dummy for a prefecture capital in 1820, the dummy for being designated as the most important county in 1820, and the dummy for being a trade center in 1915. Only the estimation results of the key variables are presented. Standard errors are robust and clustered at the prefecture level.
*** p<0.01, ** p<0.05, * p<0.1

Table 5. Property Rights: Early Taiping vs. Late Taiping

	Dependent variable: log population size		
	(1)	(2)	(3)
	OLS, FS	SAR, FS	OLS, PSM
Early Taiping*Year 1851	-0.005	0.017	-0.017
	[0.020]	[0.075]	[0.024]
Early Taiping*Year 1880	-0.446***	-0.199***	-0.345***
	[0.100]	[0.075]	[0.122]
Early Taiping*Year 1910	-0.425***	-0.160**	-0.308**
	[0.094]	[0.075]	[0.126]
Early Taiping*Year 1953	-0.556***	-0.256***	-0.428***
	[0.100]	[0.076]	[0.125]
Early Taiping*Year 1982	-0.472***	-0.195***	-0.340***
	[0.091]	[0.076]	[0.120]
Early Taiping*Year 2000	-0.449***	-0.168**	-0.322***
	[0.096]	[0.076]	[0.121]
Late Taiping*Year 1851	0.005	0.008	0.044*
	[0.035]	[0.117]	[0.027]
Late Taiping*Year 1880	-0.500**	-0.230*	-0.385**
	[0.194]	[0.118]	[0.168]
Late Taiping*Year 1910	-0.510***	-0.297**	-0.494***
	[0.163]	[0.118]	[0.170]
Late Taiping*Year 1953	-0.312**	-0.109	-0.021
	[0.142]	[0.118]	[0.216]
Late Taiping*Year 1982	-0.314**	-0.132	-0.120
	[0.142]	[0.118]	[0.194]
Late Taiping*Year 2000	-0.338**	-0.138	-0.141
	[0.151]	[0.118]	[0.208]
Observations	1862	1862	945
R-squared	0.796	0.152	0.843
Number of prefectures	266	266	135
CD test: population (in logs)	396.468		
CD test: residuals	11.279		
rho		2.020***	
		[0.113]	
lambda		2.275***	
		[0.020]	
Log likelihood		210.400	
Control	Y	Y	Y
Cluster at prefecture level	Y	Y	Y
Year fixed effect	Y	Y	Y
Prefecture fixed effect	Y	Y	Y

Note: The full sample (FS) is a prefecture-year panel for 266 prefectures in seven years (1820 and six years presented in the table). The matched sample (PSM) contains 135 prefectures, obtained through propensity score matching. The control variables include time-varying variables are time-invariant variables (interacted with period indicators). The time-varying variables are the distance to Yangtze River, to the coastline, and to the Grand Canal; the duration of treaty ports; the durations of concessions and leased territories; and the frequency of wars since 1776. Time-invariant variables are the number of neighboring provinces, the level of land taxes per unit of land; the total number of palace scholars (*jinshi*) from 1793–1820, indicators for silk- and tea-producing prefectures, and indicators of the four post designations classified by the Qing government in 1820. Columns (1) and (3) are linear regression models estimated by OLS. Column (2) uses a SAR model. Only the estimation results for the key variables are reported. Standard errors are robust and clustered at the prefecture level.

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

Table 6. Taiping Rebellion and *Likin* Revenue

	Dependent variable: log (1 + avg *likin* per 1000 km^2)			
	(1)	(2)	(3)	(4)
	FS	FS	PSM	PSM
Taiping*Period 1869-1879	2.500***		2.188***	
	[0.566]		[0.633]	
Taiping*Period 1880-1908	1.752***		1.416***	
	[0.406]		[0.389]	
Taiping*Period 1922-1925	1.297***		1.092***	
	[0.325]		[0.323]	
Early Taiping*Period 1869-1879		2.230*		2.030**
		[0.631]		[0.664]
Early Taiping*Period 1880-1908		1.371**		1.233**
		[0.399]		[0.415]
Early Taiping*Period 1922-1925		1.025*		0.956**
		[0.298]		[0.335]
Late Taiping*Period 1869-1879		3.120**		3.070*
		[0.457]		[0.588]
Late Taiping*Period 1880-1908		2.626**		2.438**
		[0.315]		[0.378]
Late Taiping*Period 1922-1925		1.922**		1.855**
		[0.273]		[0.291]
Observations	1064	1064	540	540
R-squared	0.904	0.904	0.956	0.957
Number of prefectures	266	266	135	135
Cluster at prefecture level	Y	Y	Y	Y
Period fixed effect	Y	Y	Y	Y
Prefecture fixed effect	Y	Y	Y	Y
Log population 1820*Period FE	Y	Y	Y	Y

Note: The full sample (FS) is a prefecture-period panel for 266 prefectures in four time periods (one base pre-period when *likin* is zero and three periods presented in the table). The matched sample (PSM) is a prefecture-period panel for 135 prefectures over the same span. *Likin* revenue is converted into 1887 silver teal. Only the estimation results of the key variables are presented. Standard errors are robust and clustered at the provincial level.
*** p<0.01, ** p<0.05, * p<0.1

Table 7. Taiping Rebellion and Charities

	Dependent variable: log (1 + number of charities)			
	(1)	(2)	(3)	(4)
	FS	FS	PSM	PSM
Taiping*Year 1851	-0.007		0.038	
	[0.068]		[0.095]	
Taiping*Year 1880	0.118		0.170	
	[0.103]		[0.152]	
Taiping*Year 1910	0.135		0.249*	
	[0.110]		[0.132]	
Taiping*Year 1941	0.114		0.238*	
	[0.110]		[0.134]	
Early Taiping*Year 1851		-0.042		0.040
		[0.072]		[0.100]
Early Taiping*Year 1880		0.056		0.134
		[0.108]		[0.152]
Early Taiping*Year 1910		0.051		0.201
		[0.114]		[0.131]
Early Taiping*Year 1941		0.022		0.193
		[0.113]		[0.130]
Late Taiping*Year 1851		0.166*		0.020
		[0.092]		[0.141]
Late Taiping*Year 1880		0.427***		0.425*
		[0.158]		[0.253]
Late Taiping*Year 1910		0.557***		0.581**
		[0.175]		[0.239]
Late Taiping*Year 1941		0.577***		0.594**
		[0.181]		[0.261]
War frequency	0.012	0.011	0.007	0.002
	[0.008]	[0.009]	[0.013]	[0.014]
Observations	1330	1330	675	675
R-squared	0.587	0.598	0.754	0.760
Number of prefectures	266	266	135	135
Control	Y	Y	Y	Y
Cluster at prefecture level	Y	Y	Y	Y
Year Fixed Effect	Y	Y	Y	Y
Prefecture fixed effect	Y	Y	Y	Y

Note: The full sample (FS) is a prefecture-year panel for 266 prefectures in four years (1820, 1851, 1880, 1910, and 1941). The matched sample (PSM) is a prefecture-year panel for 135 prefectures over the same span. The control variables include time-varying variables are time-invariant variables (interacted with period indicators). The time-varying variables are the distance to Yangtze River, to the coastline, and to the Grand Canal; the duration of treaty ports; the durations of concessions and leased territories; and the frequency of wars since 1776. Time-invariant variables are the number of neighboring provinces, the level of land taxes per unit of land; the total number of palace scholars (*jinshi*) from 1793–1820, indicators for silk- and tea-producing prefectures, and indicators of the four post designations classified by the Qing government in 1820. Only the estimation results for the key variables are reported. Standard errors are robust and clustered at the prefecture level.
*** p<0.01, ** p<0.05, * p<0.1

Table 8. Taiping Rebellion and Modern Outcomes

Dependent variable:	Log ag & ind. output per capita (1982) (1)	% Middle school graduates (1982) (2)	% Literate population (1982) (3)	Log avg. years of schooling (2000) (6)	Log GDP per capita (2010) (4)	Log fiscal revenue per capita (2010) (5)
Panel A.						
Taiping	0.243***	0.003	-0.016	0.020	0.035	0.413***
	[0.088]	[0.007]	[0.019]	[0.016]	[0.101]	[0.150]
Ln (Jinshi$_{1793\text{-}1820}$)	0.160***	0.011***	0.031***	0.027***	0.099**	0.176***
	[0.035]	[0.003]	[0.008]	[0.008]	[0.048]	[0.053]
Ln (pre-TP wars)	0.061	-0.000	-0.009	-0.014	-0.118	-0.228*
	[0.107]	[0.008]	[0.020]	[0.023]	[0.103]	[0.131]
Controls	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
R-squared	0.407	0.303	0.277	0.336	0.391	0.433
Panel B.						
Early Taiping	0.130	-0.007	-0.022	0.019	-0.154	0.190
	[0.091]	[0.007]	[0.020]	[0.017]	[0.105]	[0.165]
Late Taiping	0.642***	0.038***	0.006	0.025	0.625***	1.109***
	[0.162]	[0.013]	[0.029]	[0.031]	[0.166]	[0.222]
Ln (Jinshi$_{1793\text{-}1820}$)	0.174***	0.013***	0.031***	0.027***	0.120**	0.201***
	[0.035]	[0.003]	[0.008]	[0.009]	[0.049]	[0.053]
Ln (pre-TP wars)	0.045	-0.002	-0.010	-0.014	-0.148	-0.263*
	[0.113]	[0.008]	[0.020]	[0.023]	[0.098]	[0.137]
Controls	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
R-squared	0.437	0.339	0.279	0.336	0.447	0.479
Panel C.						
Early Taiping	0.062	-0.019**	-0.056***	-0.020	-0.250**	0.171
	[0.087]	[0.008]	[0.020]	[0.016]	[0.103]	[0.162]
Late Taiping	0.486***	0.030**	-0.027	-0.013	0.433***	0.966***
	[0.152]	[0.013]	[0.029]	[0.030]	[0.165]	[0.234]
Ln (Jinshi$_{1793\text{-}1820}$)	0.170***	0.016***	0.039***	0.035***	0.114**	0.174***
	[0.036]	[0.003]	[0.008]	[0.008]	[0.048]	[0.055]
Ln (pre-TP wars)	0.056	-0.004	-0.014	-0.019	-0.137	-0.237*
	[0.109]	[0.007]	[0.018]	[0.019]	[0.095]	[0.129]
Ln (Likin$_{1880}$)	0.029	0.006***	0.017***	0.019***	0.041**	-0.002
	[0.018]	[0.001]	[0.003]	[0.004]	[0.018]	[0.019]
Ln (Charity$_{1880\text{-}1953}$)	0.101**	-0.004	0.000	0.002	0.130***	0.156***
	[0.047]	[0.003]	[0.009]	[0.009]	[0.046]	[0.058]
Controls	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
R-squared	0.468	0.420	0.373	0.447	0.490	0.502

Note: Control variables include the (log) distances to the Yangtze River and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of palace scholars (*jinshi*) from 1793–1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk producing prefectures, and the number of wars before Taiping rebellion. Only the estimation results for key variables are reported. Standard errors are robust. *** p<0.01, ** p<0.05, * p<0.1.

Table 9. Taiping Rebellion and Early Industrialization

	Firm Entry, 1858–1937			Production, 1933		
	(1)	(2)	(3)	(4)	(5)	(6)
Taiping	0.082			1.175		
	(0.141)			(0.770)		
Early Taiping		-0.181**	-0.208**		-0.505	-0.615
		(0.088)	(0.092)		(0.413)	(0.413)
Late Taiping		0.468*	0.347		3.638**	3.154**
		(0.278)	(0.297)		(1.490)	(1.555)
Ln ($Charity_{1880\text{-}1910}$)			0.165***			0.660***
			(0.043)			(0.199)
Observations	356	356	356	356	356	356
R-squared	0.515	0.533	0.566	0.358	0.387	0.407
SSM investment	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y
Province fixed effect	Y	Y	Y	Y	Y	Y

Note: The dependent variable for Columns (1) and (2) is the number of new industrial firms between 1858–1937 (plus one and logged). The dependent variable for Columns (3) and (4) is the production value in 1933 (plus one and logged). The control variables include the distance to the Yangtze River and to the coastline, the dummy for a prefecture capital in 1820, the dummy for being designated as the most important county in 1820, the dummy for being a trade center in 1915, and the military investment during the Self-Strengthening Movement (1861–1895; SSM). Only the estimation results of the key variables are presented. Standard errors are robust and clustered at the prefecture level.

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

Table 10. Taiping Rebellion, Interpersonal Trust, and Civic Engagement

Dependent variable:	(1) Trust in Relatives	(2) Trust in Friends	(3) Trust in Coworkers	(4) Attention to Politics	(5) Engagement in Local Affairs
Panel A: Taiping dummy					
Taiping	0.138***	0.088	0.107**	-0.012	0.003
	[0.047]	[0.055]	[0.053]	[0.027]	[0.028]
Observations	6416	6404	6123	6406	6415
R-squared	0.022	0.025	0.025	0.294	0.045
Panel B: Early vs. Late Taiping					
Early Taiping	0.138***	0.071	0.080	-0.041	-0.021
	[0.050]	[0.056]	[0.058]	[0.025]	[0.030]
Late Taiping	0.140**	0.140*	0.194***	0.085*	0.079*
	[0.069]	[0.079]	[0.066]	[0.045]	[0.041]
Observations	6416	6404	6123	6406	6415
R-squared	0.022	0.025	0.026	0.297	0.047
Baseline controls	Y	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y	Y

Note: All regressions control for log distances to the Yangtze and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of *jinshi* from 1793 through 1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk production, and the number of wars prior to the Taiping Rebellion. Individual-level covariates include indicators for gender, educational attainment, age, urban residence, employment status, marital status, and membership of the Chinese Communist Party. Robust standard errors clustered at the prefecture level are reported in brackets.
*** p<0.01, ** p<0.05, * p<0.1.

Table 11. Taiping Rebellion and Great Chinese Famine (1959–1961)

	Dependent variable: Famine Control		
	(1)	(2)	(3)
Taiping	0.069***		
	[0.021]		
Early Taiping		0.065**	0.061**
		[0.025]	[0.024]
Late Taiping		0.084**	0.079**
		[0.035]	[0.036]
Political Radicalism (i.e., -PMD)			-0.026
			[0.019]
Ln ($Jinshi_{1793–1820}$)	-0.003	-0.002	-0.005
	[0.011]	[0.011]	[0.010]
Ln (Pre-TP wars)	0.016	0.015	0.022
	[0.031]	[0.032]	[0.033]
Controls	0.503	0.503	0.503
Observations	Y	Y	Y
R-squared	164	164	164

Note: The dependent variable is "famine control"—a higher value of which means a lower famine severity. All regressions control for log distances to the Yangtze and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of *jinshi* from 1793–1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Robust standard errors are reported in brackets.
*** p<0.01, ** p<0.05, * p<0.1.

Appendices

A. Additional Results

This section includes additional results that are discussed in the paper.

Table A1. Distribution of Prefectures in Different Groups

	Taiping Treatment		Controls	Total
	Early Taiping	Late Taiping		
Provinces within Taping jurisdiction	37	18	6	61
Anhui	*13*		*0*	*13*
Jiangxi	*14*		*0*	*14*
Hubei	*10*		*1*	*11*
Jiangsu		*7*	*5*	*12*
Zhejiang		*11*	*0*	*11*
Provinces outside Taiping jurisdiction	0	0	142	*205*
Full Sample	37	18	147	*266*

Note: The control group consists of non-Taiping-jurisdiction prefectures. The treatment group consists of prefectures that were officially within the Taiping regime's jurisdiction. The Early Taiping group consists of prefectures that the Taiping regime captured in Anhui, Jiangxi, and Hubei provinces. The Late Taiping group consists of prefectures that the Taiping regime conquered in Jiangsu and Zhejiang provinces.

Table A2. Variable Definitions and Sources

Variable	Definition and Source
Log (Population)	Log population size of a prefecture (unit: 10,000) in specific years. Source: China Population Census Data, Cao (2001).
Taiping	Equal to 1 if there was any county in the prefecture under the control of the Taiping regime. Source: Hua (1991).
Early Taiping	Equal to 1 if a prefecture was under the Taiping regime's control and was in Anhui, Jiangxi, or Hubei Provinces, which experienced the early phase of the land policy of the Taiping regime. Source: Bol and Ge (2007), Hua (1991).
Late Taiping	Equal to 1 if a prefecture was under the Taiping regime's control and was in Zhejiang or Jiangsu Provinces, which experienced the late phase of the land policy of the Taiping regime. Source: Bol and Ge (2007), Hua (1991).
Log (No. of Battles)	Number of Battles in a prefecture during Taiping Rebellion (in logs). Source: Hua (1991).
Log (Duration)	Duration (days) of Taiping occupation (in logs). Source: as above.
Log Distance to XXX	Log distance (in meters) from the seat of the prefecture to XXX. XXX could be the Yangtze River, or the coastline, or the Grand Canal. Source: Bol and Ge (2007).
Log Distance to Nanjing	Standardized log distance to Nanjing. Source: Bol and Ge (2007).
Land tax per mu in 1820	The farmland tax in taels of silver per mu for a prefecture in 1820. Source: Liang (1980)
Number of palace graduates, 1793–1820	The number of people received the palace graduate (*jinshi*) title from 1790–1820 per million population in 1776 for each prefecture. Source: Jiang (2007).
Number of palace graduates, time-varying	The number of people received palace graduate (*jinshi*) title in each prefecture between the end of the last period and the start of the current period. For the base year 1820, the measure refers to that between 1793 and 1820. Source: Jiang (2007).
Number of neighboring provinces	Number of neighboring provinces for a prefecture. Source: Bol and Ge (2007).
Tea (silk) prefecture	Equal to 1 if any county in the prefecture is a tea (silk) production area. Source: Wu (1990), Zhu (1992)
Post designations being XXX	Dummy variable equal to 1 if a prefecture's importance label in 1820 included XXX, which could be: "important in transportation (*chong*)", "important in businesses (*fan*)", "difficult to gather taxes (*pi*)", and "high in crimes (*nan*)." Source: Bol and Ge (2007).
Duration of the treaty port status	Duration of being a treaty port before 1949 (in years). Source: Yan (1955).
Duration of the concession status	Duration of being a concession before 1949 (in years). Source: Fei (1991).
Duration of the leased territory status	Duration of being a leased territory before 1949 (in years). Source: Fei (1991).
Frequency of wars since 1776	The number of wars/battles from 1776 to the current year in each prefecture. Source: Li (2007), Chinese Military History Editorial Committee (2003).
Longitude	Longitude of the prefecture seat. Source: Bol and Ge (2007).
Percentage of idle land	Idle lands / (Idle lands + Cultivated Land) in 1915. Source: The Agriculture and Commerce Statistic Table of Republic of China (1915).
Percentage of households with land within interval X	(Households holding X mu land / Total of households) in 1919. X = < 10, 10–30, 30–50, 50–100, or >100. Source: The Agriculture and Commerce Statistic Table of Republic of China (1915).
Percentage of self-farming households	(Self-farming households / Total of households) in 1919. Source: The Agriculture and Commerce Statistic Table of Republic of China (1915).
Prefecture capital seat	Equal to 1 if the town hall of a prefecture is located in the county. Source: Bol and Ge (2007)
Greatest-importance county	Equal to 1 if the county was classified as the most important in 1820. Source: Bol and Ge (2007).
Trade center	Equal to 1 if the county is a trade center designed by Shina Shobetsu Zenshi (1915). Source: as above.
Likin intensity	The average annual provincial revenue of *likin* in taels of silver per 1000 km^2 during period X (X = 1869–1879, 1880–1908, or 1922–1925). The variable is zero for other periods. Source: Luo (1936); The Second Historical Archives of China (1996).
No. of Charities	Number of charities. Source: Koyama and Xue (2015) and Liang (2001).
Log agricultural-and-industrial output per capita, 1982	Prefectural-level log agricultural-and-industrial output per capita in 1982. Source: 1982 Population Census.
Share of middle school graduates, 1982	Prefectural-level share of middle school graduates in the population in 1982. Source: 1982 Population Census.
Share of literate population, 1982	Prefectural-level literacy rate in 1982. Source: 1982 Population Census.

Table A2. Variable Definitions and Sources (Cont'd)

Log (Schooling 2000)	Prefectural-level log average years of schooling in 2000. Source: 2000 Population Census.
Log (GDP PC 2010)	Log GDP per capita. Source: City Statistical Yearbook, 2011
Log (Fis Rev PC 2010)	Log revenue of local government per capita in 2010. Source: City Statistical Yearbook, 2011
Party Member Density (PMD)	Provincial-level percentage of population who were Chinese Communist Party members as of mid-1956. Source: Yang (1996, Table 7, p. 57).
Political Radicalism	-1*PMD. Source: as above.
Famine Control (Fang et al 2023)	Main measure for famine severity. Defined as $\text{Famine Control}_i = \frac{\text{Size of cohorts born in 1959–61, prefecture } i}{\text{Size of cohorts born in 1954–57, prefecture } i}$. Source: 1990 population census (from IPUMS).
Famine Control (Kasahara and Li 2020)	Alternative measure for famine severity. Used for robustness. Defined as $\text{Famine Control}_i = \frac{\text{Size of cohorts born in 1959–61, prefecture } i}{\text{Size of cohorts born in 1953–65, prefecture } i}$. Source: as above.
Famine Control (Chen and Yang 2015)	Alternative measure for famine severity. Used for robustness. Defined as $\text{Famine Control}_i = \frac{\text{Size of cohorts born in 1959–61, prefecture } i}{\text{Projected size of cohorts born in 1959–61, prefecture } i}$. Source: as above.
Attention to politics	Equal to 1 if an individual reports that they at least occasionally "read books, newspapers, and journals about politics." Source: China General Social Survey in 2010.
Engagement in local affairs	Equal to 1 if an individual reports that they have ever served in local community committees, made suggestions to the committees, participated in petitions, signed joint letters, contacted journalists for community issues, contacted the government for community issues, or participated in protests or demonstrations. Source: as above.
Trust in X	An individual's reported trust level for subject X (= friends, relatives, or coworkers). It is in a 1–5 scale. A higher value means a higher level of trust. Source: as above.
New industrial firms 1858–1937	Number of industrial firms established from 1858–1937 at the county level. Source: Du (1991, 2019); Bo et al. (2023).
Production value 1933	Industrial output in 1933 at the county level. Source: Liu (1937); Bo et al. (2023).
Military investment during the SSM	Qing government's military investment during the self-strengthening movement at the county level. Source: Bo et al. (2023)

Table A3. Summary Statistics

Variable	Level	Observations	Mean	Std. Dev.	Min	Max
Dependent Variables						
Ln population size	Prefecture-year	1862	4.854	1.120	1.194	8.173
Ln agricultural-and-industrial output p.c., 1982	Prefecture	6.332	0.556	5.174	8.597	6.332
Share of middle school graduates, 1982	Prefecture	0.163	0.044	0.055	0.283	0.163
Share of literate population, 1982	Prefecture	0.652	0.109	0.352	0.843	0.652
ln (Sch. 2000)	Prefecture	1.988	0.112	1.625	2.234	1.988
ln (GDP PC 2010)	Prefecture	9.846	0.620	8.421	11.927	9.846
ln (Fis Rev 2010)	Prefecture	-2.414	0.801	-4.166	0.212	-2.414
Key Independent Variables						
Taiping	Prefecture	266	0.207	0.406	0.000	1.000
Taiping*log(No. of Battles)	Prefecture	266	0.190	0.349	0.000	1.322
Taiping*log(Duration)	Prefecture	266	0.521	1.274	0.000	5.800
Early Taiping	Prefecture	266	0.139	0.347	0.000	1.000
Late Taiping	Prefecture	266	0.068	0.252	0.000	1.000
Control Variables						
Distance to Yangtze (log)	Prefecture	266	12.484	1.255	5.066	14.038
Distance to Coast (log)	Prefecture	266	12.710	1.152	7.572	14.448
Distance to Grand Canal (log)	Prefecture	266	13.027	1.297	5.582	14.552
Land Tax per Mu in 1820	Prefecture	266	0.080	0.076	0.002	0.664
Number of Jinshi from 1793–1820	Prefecture	266	10.508	17.319	0.000	148.000
Number of Jinshi from 1793–1820 per million population (1776)	Prefecture	266	8.219	9.851	0.000	74.484
Number of Neighboring Provinces	Prefecture	266	1.083	0.825	0.000	3.000
Tea Prefecture Dummy	Prefecture	266	0.500	0.501	0.000	1.000
Silk Prefecture Dummy	Prefecture	266	0.083	0.276	0.000	1.000
Post Designation Chong in 1820	Prefecture	266	0.658	0.475	0.000	1.000
Post Designation Fan in 1820	Prefecture	266	0.917	0.276	0.000	1.000
Post Designation Pi in 1820	Prefecture	266	0.380	0.486	0.000	1.000
Post Designation Nan in 1820	Prefecture	266	0.805	0.397	0.000	1.000
Duration of the Treaty port	Prefecture-year	1862	5.214	17.729	0.000	106.000
Duration of the Concession	Prefecture-year	1862	1.425	9.767	0.000	99.000
Duration of the Leased Territory	Prefecture-year	1862	0.367	3.887	0.000	58.000
Frequency of Wars since 1776	Prefecture-year	1862	2.352	2.940	0.000	17.000
Number of Jinshi in each prefecture by period	Prefecture-year	1862	9.515	23.135	0.000	302.000
Instruments and Others						
Longitude	Prefecture	266	111.596	5.746	95.789	121.543
Other Key Variables in Modern Data						
ln (1 + charities in 1776)	Prefecture	191	0.961	0.951	0.000	3.584
ln (1 + charities in 1820)	Prefecture	191	1.150	1.063	0.000	4.317
ln (1 + charities in 1851)	Prefecture	191	1.337	1.168	0.000	4.997
ln (1 + charities in 1880)	Prefecture	191	1.578	1.348	0.000	5.242
ln (1 + charities in 1910)	Prefecture	191	1.734	1.416	0.000	5.434
ln (1 + charities in 1941)	Prefecture	191	1.760	1.417	0.000	5.707
ln (1 + avg. charities in 1880-1953)	Prefecture	191	1.701	1.391	0.000	5.403
ln (1 + avg *likin* per 1k km^2 from 1869–1879)	Prefecture	191	6.800	2.808	0.000	10.075
ln (1 + avg *likin* per 1k km^2 from 1880–1908)	Prefecture	191	7.714	1.299	6.424	10.193
ln (1 + avg *likin* 1k km^2 from 1922–1925)	Prefecture	191	8.587	1.097	6.084	10.426
Agriculture Data in 1915						
Percentage of idle land	County	332	4.460	9.838	0.000	75.105
% HH w/ <10 mu	County	115	42.308	21.559	4.902	99.784
% HH w/ 10-30 mu	County	115	32.499	14.269	0.086	79.313
% HH w/ 30-50 mu	County	115	14.443	11.077	0.052	61.826
% HH w/ 50-100 mu	County	115	8.034	8.768	0.000	36.580
% HH w/ >100 mu	County	115	2.716	4.266	0.000	27.774
% self-farming HHs	County	115	46.203	22.281	3.008	100.000
Taiping Regime	County	332	0.741	0.439	0.000	1.000
Early Taiping	County	332	0.455	0.499	0.000	1.000
Late Taiping	County	332	0.286	0.453	0.000	1.000
Initial Likin (1880)	County	332	9.155	0.977	0.000	10.075
standardized log distance to Nanjing	County	332	-0.000	0.997	-13.190	1.176
Prefecture Capital Seat	County	332	0.057	0.233	0.000	1.000
Greatest Important County in 1820	County	332	0.386	0.487	0.000	1.000
Trade Center in 1915	County	332	4.460	9.838	0.000	75.105
Party Member Density and Great Famine						
Famine Control (Fang et al. 2023)	Prefecture	164	0.503	0.125	0.234	1.171
Famine Control (Kasahara and Li 2020)	Prefecture	164	0.150	0.031	0.071	0.226
Famine Control (Chen and Yang 2015)	Prefecture	164	0.570	0.145	0.234	0.921
Political Radicalism (-1*PMD)	Province	18	-1.288	0.722	-3.140	-0.710

Table A3. Summary Statistics (Cont'd)

Trust in Relatives	Individual	6424	4.163	0.738	1.000	5.000
Trust in Friends	Individual	6412	3.789	0.793	1.000	5.000
Trust in Coworkers	Individual	6131	3.494	0.790	1.000	5.000
Attention to politics	Individual	6413	0.337	0.473	0.000	1.000
Engagement in local affairs	Individual	6423	0.183	0.387	0.000	1.000
Early Industrialization Data						
Ln (1 + new industrial firms 1858–1937)	County	356	0.685	1.076	0.000	7.491
Ln (1 + production value 1933)	County	356	2.323	5.432	0.000	20.442
Ln (1 + military investment during the SSM)	County	356	0.244	1.902	0.000	18.116

Table A4. 2SLS Estimation with One Endogenous Variable

Panel A. Second Stage					
	Pop1880	Pop1910	Pop1953	Pop1982	Pop2000
Taiping	-0.739***	-0.786***	-1.126***	-1.016***	-1.124***
	(0.233)	(0.225)	(0.277)	(0.282)	(0.299)
Observations	798	798	798	798	798
R-squared	0.320	0.226	0.389	0.794	0.836
Panel B. First Stage					
Longitude	0.039***	0.039***	0.036***	0.036***	0.036***
	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
F test	37.200	34.201	27.337	27.337	27.337
Observations	798	798	798	798	798
R-squared	0.667	0.662	0.649	0.649	0.649
Number of prefectures	266	266	266	266	266
Control	Y	Y	Y	Y	Y
Cluster at prefecture level	Y	Y	Y	Y	Y
Year Fixed Effect	Y	Y	Y	Y	Y
Prefecture Fixed Effect	Y	Y	Y	Y	Y

Panel C. Falsification test on IV validity									
	Pop1820	Pop1820	War Frequency	Land tax per mu 1820	No. of *Jinshi* 1793-1820	Chong	Fan	Pi	Nan
Longitude	0.065***	-0.003	0.003	-0.003	-0.021	0.010	-0.005	-0.032***	-0.009
	(0.015)	(0.003)	(0.007)	(0.002)	(0.222)	(0.009)	(0.006)	(0.010)	(0.009)
Observations	266	266	266	266	266	266	266	266	266
R-squared	0.288	0.967	0.077	0.035	0.031	0.039	0.013	0.052	0.006
Number of prefectures	266	266	266	266	266	266	266	266	266
Control	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cluster at prefecture level	Y	Y	Y	Y	Y	Y	Y	Y	Y
Control Pop 1776	N	Y	Y	Y	Y	Y	Y	Y	Y

Note: The sample contains a prefecture-year panel for 266 prefectures and three time periods, 1820, 1851, and one post-Rebellion year. Only the estimation results of the key variables are presented. In Panels A and B, the time-varying control variables are the duration of treat ports, the duration of concessions and leased territories, the frequency of wars since 1776. Also included are time dummies interacted with the following time-invariant controls: the distance to Yangtze River, to the coastline, and to the Grand Canal; the number of neighboring provinces; the pre-war level of land taxes per mu; the total number of palace graduates per million people from 1793-1820; silk and tea prefectures dummy variables; the indicators of the four post designations classified by the Qing government in 1820. In Panel C, the control variables include the following variables (and in case it is the dependent variable, it is excluded): the distance to Yangtze River, to the coastline, and to the Grand Canal; the number of neighboring provinces; the duration of treaty ports; the level of land taxes; the total number of palace graduates per million people from 1793-1820; silk and tea prefectures dummy variables; the indicators of the four post designations classified by the Qing government in 1820; the frequency of wars since 1776; and the population in 1776. Standard errors are robust, clustered at the prefecture level. *** p<0.01, ** p<0.05, * p<0.1.

Table A5. Taiping Rebellion, Likin, Charities and Modern Outcomes: SAR Model

Dependent variable:	Log ag & ind. output per capita (1982) (1)	% Middle school graduates (1982) (2)	% Literate population (1982) (3)	Log avg. years of schooling (2000) (4)	Log GDP per capita (2010) (5)	Log fiscal revenue per capita (2010) (6)
Panel A.						
Taiping	0.246**	-0.001	-0.005	-0.005	-0.162	0.279
	[0.108]	[0.010]	[0.020]	[0.024]	[0.151]	[0.177]
Ln (Jinshi$_{1793\text{-}1820}$)	0.159***	0.011***	0.029***	0.023***	0.078**	0.105**
	[0.036]	[0.003]	[0.006]	[0.007]	[0.037]	[0.047]
Ln (pre-TP wars)	0.067	0.004	0.018	-0.023	-0.064	-0.144
	[0.106]	[0.008]	[0.017]	[0.022]	[0.113]	[0.138]
Controls	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
Log likelihood	-107.990	398.079	234.708	194.808	-112.051	-149.768
Panel B.						
Early Taiping	0.126	-0.005	-0.023	-0.010	-0.244	0.229
	[0.112]	[0.010]	[0.023]	[0.026]	[0.149]	[0.163]
Late Taiping	0.643***	0.047***	0.036	0.015	0.394*	1.010***
	[0.164]	[0.016]	[0.034]	[0.038]	[0.233]	[0.240]
Ln (Jinshi$_{1793\text{-}1820}$)	0.172***	0.012***	0.029***	0.023***	0.090**	0.183***
	[0.035]	[0.003]	[0.006]	[0.007]	[0.037]	[0.049]
Ln (pre-TP wars)	0.049	-0.000	0.010	-0.024	-0.094	-0.224
	[0.104]	[0.008]	[0.017]	[0.022]	[0.111]	[0.143]
Controls	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
Log likelihood	-103.227	398.507	232.124	195.036	-107.534	-157.012
Panel C.						
Early Taiping	0.077	-0.009	-0.033	-0.033	-0.229	0.202
	[0.112]	[0.010]	[0.023]	[0.023]	[0.145]	[0.166]
Late Taiping	0.499***	0.038**	-0.049	-0.020	0.286	0.819***
	[0.167]	[0.017]	[0.033]	[0.034]	[0.235]	[0.245]
Ln (Jinshi$_{1793\text{-}1820}$)	0.167***	0.013***	0.027***	0.032***	0.065*	0.144***
	[0.036]	[0.003]	[0.006]	[0.007]	[0.037]	[0.048]
Ln (pre-TP wars)	0.064	0.002	0.017	-0.021	-0.100	-0.194
	[0.101]	[0.007]	[0.016]	[0.021]	[0.106]	[0.138]
Ln (Likin$_{1880}$)	0.030*	0.005***	0.009*	0.018***	0.028	-0.000
	[0.016]	[0.002]	[0.004]	[0.003]	[0.022]	[0.023]
Ln (Charity$_{1880\text{-}1941}$)	0.106***	0.004	0.019***	0.002	0.150***	0.159***
	[0.038]	[0.003]	[0.007]	[0.008]	[0.042]	[0.053]
Controls	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
Log likelihood	-97.596	409.737	242.168	205.903	-99.250	-152.146

Note: Control variables include the (log) distances to the Yangtze River and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of palace scholars (*jinshi*) from 1793–1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk producing prefectures, and the number of wars before Taiping rebellion. Only the estimation results for key variables are reported. Standard errors are robust. *** p<0.01, ** p<0.05, * p<0.1.

Table A6. Taiping Rebellion, Likin, Charities and Modern Outcomes: PSM Results

Dependent variable:	Log ag & ind. output per capita (1982) (1)	% Middle school graduates (1982) (2)	% Literate population (1982) (3)	Log avg. years of schooling (2000) (4)	Log GDP per capita (2010) (5)	Log fiscal revenue per capita (2010) (6)
Panel A.						
Taiping	0.188**	-0.010*	-0.009	0.000	-0.047	0.370***
	[0.083]	[0.006]	[0.023]	[0.018]	[0.082]	[0.135]
Ln (Jinshi$_{1793\text{-}1820}$)	0.098**	0.004	0.019*	0.010	-0.013	0.083
	[0.048]	[0.003]	[0.010]	[0.010]	[0.055]	[0.071]
Ln (pre-TP wars)	0.126	-0.013*	-0.009	-0.002	-0.223***	-0.117
	[0.103]	[0.008]	[0.021]	[0.021]	[0.084]	[0.130]
Controls	Y	Y	Y	Y	Y	Y
Observations	111	111	111	111	108	108
R-squared	0.562	0.438	0.340	0.387	0.492	0.387
Panel B.						
Early Taiping	0.131	-0.017***	-0.020	-0.004	-0.088	0.331**
	[0.084]	[0.006]	[0.023]	[0.018]	[0.086]	[0.139]
Late Taiping	0.868*	0.065**	0.119	0.045	0.420***	0.808***
	[0.451]	[0.027]	[0.077]	[0.083]	[0.141]	[0.269]
Ln (Jinshi$_{1793\text{-}1820}$)	0.125***	0.007**	0.024**	0.012	0.002	0.097
	[0.047]	[0.003]	[0.010]	[0.010]	[0.058]	[0.074]
Ln (pre-TP wars)	0.152	-0.010	-0.004	-0.000	-0.200**	-0.095
	[0.112]	[0.007]	[0.022]	[0.023]	[0.082]	[0.135]
Controls	Y	Y	Y	Y	Y	Y
Observations	111	111	111	111	108	108
R-squared	0.590	0.512	0.367	0.391	0.505	0.394
Panel C.						
Early Taiping	0.099	-0.022***	-0.058**	-0.031	-0.123	0.373**
	[0.099]	[0.008]	[0.023]	[0.021]	[0.093]	[0.148]
Late Taiping	0.619	0.065**	0.079	0.036	0.198	0.622**
	[0.426]	[0.027]	[0.069]	[0.077]	[0.187]	[0.304]
Ln (Jinshi$_{1793\text{-}1820}$)	0.094*	0.008**	0.027***	0.018*	-0.031	0.056
	[0.048]	[0.004]	[0.010]	[0.010]	[0.057]	[0.077]
Ln (pre-TP wars)	0.178	-0.012	-0.007	-0.005	-0.168*	-0.060
	[0.109]	[0.008]	[0.022]	[0.023]	[0.087]	[0.136]
Ln (Likin$_{1880}$)	-0.010	0.003*	0.016***	0.014**	-0.012	-0.047
	[0.026]	[0.002]	[0.005]	[0.007]	[0.024]	[0.032]
Ln (Charity$_{1880\text{-}1941}$)	0.111**	-0.002	0.007	-0.005	0.120**	0.110
	[0.047]	[0.003]	[0.011]	[0.009]	[0.049]	[0.073]
Controls	Y	Y	Y	Y	Y	Y
Observations	111	111	111	111	108	108
R-squared	0.614	0.529	0.426	0.438	0.542	0.420

Note: Control variables include the (log) distances to the Yangtze River and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of palace scholars (*jinshi*) from 1793–1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk producing prefectures, and the number of wars before Taiping rebellion. Only the estimation results for key variables are reported. Standard errors are robust. *** p<0.01, ** p<0.05, * p<0.1.

Table A7. Taiping Rebellion and Firm Entry by Period

	(1)	(2)
	Firm entry, 1858–1895	Firm entry, 1896-1937
Early Taiping	-0.005	-0.178*
	(0.018)	(0.089)
Late Taiping	-0.042	0.495*
	(0.048)	(0.278)
SSM investment	Y	Y
Controls	Y	Y
Province fixed effect	Y	Y
Observations	356	356
R-squared	0.410	0.535

Note: The dependent variable is the number of new industrial firms before or after 1895 (plus one and logged). The control variables include the distance to the Yangtze River and to the coastline, the dummy for a prefecture capital in 1820, the dummy for being designated as the most important county in 1820, the dummy for being a trade center in 1915, and the military investment during the Self-Strengthening Movement (1861–1895; SSM). Only the estimation results of the key variables are presented. Standard errors are robust and clustered at the prefecture level. *** p<0.01, ** p<0.05, * p<0.1.

Table A8. Taiping Rebellion and Great Chinese Famine (1959–1961): Alternative Measures

	DV: Famine Control (Chen and Yang 2015)			DV: Famine Control (Kasahara and Li 2020)		
	(1)	(2)	(3)	(5)	(6)	(7)
Taiping	0.085***			0.019***		
	[0.027]			[0.006]		
Early Taiping		0.074**	0.065**		0.017**	0.015**
		[0.032]	[0.029]		[0.007]	[0.007]
Late Taiping		0.121***	0.109***		0.027***	0.024***
		[0.041]	[0.041]		[0.009]	[0.009]
Radicalism (-PMD)			-0.067***			-0.013***
			[0.019]			[0.004]
Ln ($Jinshi_{1820}$)	0.009	0.010	0.002	0.001	0.001	-0.000
	[0.010]	[0.010]	[0.010]	[0.002]	[0.002]	[0.002]
Ln (Pre-TP wars)	0.035	0.033	0.051	0.008	0.008	0.011
	[0.033]	[0.033]	[0.033]	[0.007]	[0.007]	[0.007]
Controls	Y	Y	Y	Y	Y	Y
Observations	164	164	164	164	164	164
R-squared	0.315	0.319	0.376	0.307	0.311	0.356

Note: The dependent variable is "famine control," following Chen and Yang (2015) and Kasahara and Li (2020)—a higher value of which means a lower famine severity. All regressions control for log distances to the Yangtze and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of *jinshi* from 1793–1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk production, and the number of wars prior to the Taiping Rebellion. Only the estimation results for key variables are reported. Robust standard errors are reported in brackets.

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

Table A9. Taiping Rebellion and Great Chinese Famine (1959–1961): SAR and PSM Results

	DV: Famine Control SAR			DV: Famine Control PSM		
	(1)	(2)	(3)	(5)	(6)	(7)
Taiping	0.069**			0.068**		
	[0.034]			[0.031]		
Early Taiping		0.057	0.053		0.062*	0.065**
		[0.035]	[0.035]		[0.034]	[0.029]
Late Taiping		0.139**	0.137**		0.122***	0.125***
		[0.054]	[0.056]		[0.037]	[0.040]
Radicalism (-PMD)			-0.038*			-0.055**
			[0.020]			[0.024]
Ln ($Jinshi_{1820}$)	-0.009	-0.008	-0.013	-0.002	-0.001	-0.003
	[0.009]	[0.009]	[0.009]	[0.012]	[0.012]	[0.011]
Ln (Pre-TP wars)	-0.009	-0.014	-0.013	-0.006	-0.008	0.015
	[0.028]	[0.028]	[0.027]	[0.029]	[0.030]	[0.031]
Controls	Y	Y	Y	Y	Y	Y
Observations	164	164	164	100	100	100
Log likelihood	143.004	144.398	145.780			
R-squared				0.409	0.412	0.461

Note: The dependent variable is "famine control," following Fang et al (2023), a higher value of which means a lower famine severity. All regressions control for log distances to the Yangtze and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of *jinshi* from 1793–1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk production, and the number of wars prior to the Taiping Rebellion. Only the estimation results for key variables are reported. Robust standard errors are reported in brackets.
*** p<0.01, ** p<0.05, * p<0.1.

B. Robustness: Controlling for Other Historical Events

This section shows that our results are robust to controlling for other historical events. Below, we briefly introduce the events considered and the measurements employed.

(1) Guangxu Drought.[53] From 1876–1879, during Guangxu Emperor's reign, a severe drought hit northern China. It induced crop failures and subsequent widespread starvation, killing 9.5–13 million people. Based on Cao (2001), we create a dummy variable that indicates a prefecture's exposure to the drought.

(2) Hui Revolt.[54] This refers to the uprising by various Chinese Muslims, mostly Hui people, in western China, between 1862 and 1877. The uprising was eventually suppressed by Qing forces led by Zuo Zongtang. Based on Cao (2001), we create a dummy variable that indicates a prefecture's exposure to the revolt.

(3) Nian Rebellion.[55] The Nian Rebellion was an insurrection against the Qing dynasty in northern China from 1851 to 1868. We code the number of battles against the Nian rebels at the 1820 Qing prefecture level, based upon Chinese Military History Editorial Committee (2003) and Li (2007).

(4) Wars in the ROC. The Republic of China (ROC) witnessed continuous internal conflicts between different forces. Drawing upon data from the Chinese Military History Editorial Committee (2003), we compile the number of battles experienced by each prefecture between 1912 and 1937, prior to the Japanese invasion. The variable captures the wars between warlords and the first phase of wars between the KMT (the ruling party of China from 1927–1949) and the CCP.

(5) Sino-Japanese War. Using data from the Chinese Military History Editorial Committee (2003), we compile the number of battles experienced by each prefecture during the Sino-Japanese War (1937–1945).

(6) Chinese Civil War. Shortly after the Sino-Japanese War, a civil war erupted between the KMT and the CCP. Using data from the Chinese Military History Editorial Committee (2003), we compile the number of battles experienced by each prefecture during the Chinese Civil War (1937–1945).

(7) Missionary activities. Missionary activities may have influenced the establishment of charity organizations, possibly through competition for the authority in public space that spurred local elites to react. Missionary activities may have facilitated knowledge transmission that would support development (Bai and Kung 2015). We obtain a variable on the size of missionary activities at the prefecture level as of 1865 from Mattingly and Chen (2022).

(8) Cultural Revolution. The Cultural Revolution from 1966–1976 featured a turbulent decade in China's modern history. The mass was mobilized to purge "class enemies," leading to severe

[53] See https://en.wikipedia.org/wiki/Northern_Chinese_Famine_of_1876%E2%80%931879.
[54] See https://en.wikipedia.org/wiki/Dungan_Revolt_(1862%E2%80%931877).
[55] See https://en.wikipedia.org/wiki/Nian_Rebellion.

political violence and disruptions of social and economic life. To measure the local influence of the Cultural Revolution, we use data from Walder (2014) to calculate each prefecture's deaths attributed to political violence relative to its population, following the existing literature (Bai and Wu 2023; Wang 2021).

In panel regressions, we add the interaction terms of above variables with year/period dummies. In cross-sectional regressions, we control for the above variables. The results are summarized as follows.

- Table B1 examines the robustness of results for population, *likin*, and charities. We control for variables (1)–(7), since the Cultural Revolution is not relevant.
- Table B2 examines the robustness of results for long-term development. We consider variables (1)–(8).
- Table B3 examines the robustness of results for modern social cohesion and civic engagement. We consider variables (1)–(8).
- Table B4 examines the robustness of results for the famine severity. We consider variables (1)–(7). Again, the Cultural Revolution is not relevant for the outcome examined.

Table B1. Taiping Rebellion and Population, Likin, and Charities: Controlling for Other Historical Events

Control (× year dummies) =	(1) Baseline	(2) Guangxu Drought	(3) Hui Revolts	(4) Nian Rebellion Battles	(5) ROC Battles	(6) Sino-Japanese War Battles	(7) Chinese Civil War Battles	(8) Missionaries	(9) All Variables
Panel A: log population size									
Taiping*Year 1851	-0.004	-0.005	-0.003	-0.004	-0.006	-0.004	-0.004	-0.003	-0.006
	[0.020]	[0.020]	[0.020]	[0.020]	[0.021]	[0.020]	[0.020]	[0.020]	[0.020]
Taiping*Year 1880	-0.454***	-0.463***	-0.465***	-0.453***	-0.435***	-0.453***	-0.435***	-0.453***	-0.428***
	[0.093]	[0.088]	[0.085]	[0.093]	[0.099]	[0.095]	[0.094]	[0.094]	[0.088]
Taiping*Year 1910	-0.438***	-0.445***	-0.449***	-0.437***	-0.415***	-0.436***	-0.420***	-0.437***	-0.406***
	[0.091]	[0.088]	[0.085]	[0.091]	[0.097]	[0.092]	[0.092]	[0.092]	[0.089]
Taiping*Year 1953	-0.513***	-0.517***	-0.528***	-0.511***	-0.496***	-0.510***	-0.476***	-0.512***	-0.473***
	[0.095]	[0.093]	[0.093]	[0.094]	[0.097]	[0.095]	[0.095]	[0.095]	[0.093]
Taiping*Year 1982	-0.443***	-0.446***	-0.458***	-0.442***	-0.427***	-0.440***	-0.407***	-0.442***	-0.403***
	[0.086]	[0.085]	[0.085]	[0.086]	[0.088]	[0.086]	[0.087]	[0.087]	[0.084]
Taiping*Year 2000	-0.428***	-0.431***	-0.443***	-0.427***	-0.415***	-0.426***	-0.390***	-0.427***	-0.388***
	[0.091]	[0.089]	[0.089]	[0.090]	[0.093]	[0.091]	[0.091]	[0.091]	[0.088]
Observations	1862	1862	1862	1862	1862	1862	1862	1862	1862
R squared	0.794	0.803	0.822	0.794	0.795	0.794	0.797	0.795	0.831
Panel B: log population size, Early vs. Late Taiping									
Early Taiping*Year 1851	-0.005	-0.006	-0.005	-0.005	-0.009	-0.006	-0.007	-0.005	-0.011
	[0.020]	[0.020]	[0.020]	[0.020]	[0.021]	[0.020]	[0.020]	[0.020]	[0.021]
Early Taiping*Year 1880	-0.446***	-0.459***	-0.488***	-0.446***	-0.420***	-0.446***	-0.431***	-0.446***	-0.454***
	[0.100]	[0.095]	[0.091]	[0.099]	[0.108]	[0.101]	[0.100]	[0.100]	[0.097]
Early Taiping*Year 1910	-0.425***	-0.435***	-0.464***	-0.424***	-0.394***	-0.422***	-0.410***	-0.424***	-0.420***
	[0.094]	[0.091]	[0.088]	[0.094]	[0.103]	[0.095]	[0.095]	[0.094]	[0.094]
Early Taiping*Year 1953	-0.556***	-0.562***	-0.592***	-0.555***	-0.538***	-0.554***	-0.520***	-0.556***	-0.541***
	[0.100]	[0.099]	[0.098]	[0.100]	[0.104]	[0.101]	[0.101]	[0.100]	[0.099]
Early Taiping*Year 1982	-0.472***	-0.477***	-0.506***	-0.472***	-0.453***	-0.470***	-0.436***	-0.471***	-0.452***
	[0.091]	[0.090]	[0.090]	[0.091]	[0.094]	[0.091]	[0.092]	[0.091]	[0.089]
Early Taiping*Year 2000	-0.449***	-0.453***	-0.481***	-0.449***	-0.432***	-0.448***	-0.412***	-0.448***	-0.429***
	[0.096]	[0.095]	[0.094]	[0.096]	[0.100]	[0.096]	[0.097]	[0.096]	[0.094]
Late Taiping*Year 1851	0.005	0.005	0.010	0.004	0.004	0.005	0.007	0.005	0.011
	[0.035]	[0.035]	[0.036]	[0.035]	[0.036]	[0.035]	[0.035]	[0.035]	[0.036]
Late Taiping*Year 1880	-0.500**	-0.490***	-0.359**	-0.495**	-0.502**	-0.490**	-0.464**	-0.500**	-0.296*
	[0.194]	[0.187]	[0.178]	[0.194]	[0.195]	[0.196]	[0.192]	[0.196]	[0.171]
Late Taiping*Year 1910	-0.510***	-0.502***	-0.379**	-0.508***	-0.511***	-0.504***	-0.478***	-0.509***	-0.326**
	[0.163]	[0.156]	[0.152]	[0.163]	[0.164]	[0.164]	[0.161]	[0.166]	[0.144]
Late Taiping*Year 1953	-0.312**	-0.306**	-0.223	-0.307**	-0.313**	-0.303**	-0.275**	-0.309**	-0.164
	[0.142]	[0.140]	[0.142]	[0.141]	[0.143]	[0.144]	[0.137]	[0.147]	[0.136]
Late Taiping*Year 1982	-0.314**	-0.309**	-0.233	-0.308**	-0.315**	-0.306**	-0.277**	-0.310**	-0.173
	[0.142]	[0.140]	[0.143]	[0.141]	[0.143]	[0.144]	[0.138]	[0.148]	[0.139]
Late Taiping*Year 2000	-0.338**	-0.333**	-0.262*	-0.330**	-0.339**	-0.328**	-0.298**	-0.334**	-0.197
	[0.151]	[0.151]	[0.152]	[0.150]	[0.152]	[0.153]	[0.147]	[0.157]	[0.151]
Observations	1862	1862	1862	1862	1862	1862	1862	1862	1862
R squared	0.796	0.804	0.823	0.796	0.796	0.796	0.798	0.797	0.833
Panel C: log (1 + *likin* per 1000 km^2)									
Early Taiping*Period 1869-1879	2.230*	2.386*	2.143*	2.234*	2.069*	2.247*	2.403*	2.215*	2.236*
	[0.631]	[0.815]	[0.651]	[0.638]	[0.567]	[0.636]	[0.781]	[0.620]	[0.841]
Early Taiping*Period 1880-1908	1.371**	1.267**	1.326**	1.369**	1.287**	1.366**	1.313**	1.364**	1.131*
	[0.399]	[0.443]	[0.432]	[0.403]	[0.368]	[0.407]	[0.422]	[0.393]	[0.432]
Early Taiping*Period 1922-1925	1.025*	1.158*	0.974*	1.030*	1.044*	1.042*	1.088*	1.020*	1.127*
	[0.298]	[0.352]	[0.340]	[0.300]	[0.322]	[0.291]	[0.330]	[0.296]	[0.410]
Late Taiping*Period 1869-1879	3.120**	3.276**	3.031**	3.141**	3.331**	3.189**	3.186**	3.105**	3.392**
	[0.457]	[0.637]	[0.501]	[0.496]	[0.541]	[0.531]	[0.515]	[0.470]	[0.747]
Late Taiping*Period 1880-1908	2.626**	2.521**	2.580**	2.616**	2.737**	2.605**	2.604**	2.619**	2.604**
	[0.315]	[0.366]	[0.357]	[0.326]	[0.325]	[0.330]	[0.320]	[0.315]	[0.385]
Late Taiping*Period 1922-1925	1.922**	2.055**	1.869**	1.946**	1.897**	1.992**	1.946**	1.917**	2.014**
	[0.273]	[0.331]	[0.314]	[0.298]	[0.257]	[0.304]	[0.285]	[0.273]	[0.359]
Observations	1064	1064	1064	1064	1064	1064	1064	1064	1064
R squared	0.904	0.907	0.905	0.904	0.905	0.905	0.906	0.905	0.910
Panel D: log (1 + cumulative charities)									
Early Taiping*Year 1851	-0.042	-0.045	-0.043	-0.044	-0.078	-0.038	-0.045	-0.043	-0.094
	[0.072]	[0.071]	[0.072]	[0.071]	[0.070]	[0.071]	[0.071]	[0.072]	[0.068]
Early Taiping*Year 1880	0.056	0.051	0.056	0.054	0.008	0.048	0.057	0.055	-0.007
	[0.108]	[0.108]	[0.108]	[0.109]	[0.111]	[0.107]	[0.109]	[0.108]	[0.108]
Early Taiping*Year 1910	0.051	0.045	0.051	0.050	-0.007	0.049	0.053	0.050	-0.017
	[0.114]	[0.112]	[0.114]	[0.114]	[0.119]	[0.113]	[0.114]	[0.113]	[0.116]
Early Taiping*Year 1941	0.022	0.016	0.022	0.024	-0.012	0.019	0.025	0.022	-0.022
	[0.113]	[0.112]	[0.114]	[0.113]	[0.119]	[0.113]	[0.113]	[0.112]	[0.115]
Late Taiping*Year 1851	0.166*	0.167*	0.168*	0.170*	0.160*	0.161*	0.160*	0.164*	0.159
	[0.092]	[0.092]	[0.094]	[0.093]	[0.092]	[0.092]	[0.093]	[0.093]	[0.097]
Late Taiping*Year 1880	0.427***	0.428***	0.427***	0.441***	0.422***	0.416***	0.430***	0.425***	0.444***
	[0.158]	[0.157]	[0.160]	[0.158]	[0.157]	[0.160]	[0.157]	[0.156]	[0.156]
Late Taiping*Year 1910	0.557***	0.559***	0.557***	0.567***	0.550***	0.539***	0.561***	0.554***	0.559***
	[0.175]	[0.174]	[0.178]	[0.176]	[0.173]	[0.176]	[0.175]	[0.172]	[0.170]
Late Taiping*Year 1941	0.577***	0.579***	0.579***	0.585***	0.573***	0.555***	0.579***	0.573***	0.578***
	[0.181]	[0.180]	[0.184]	[0.181]	[0.180]	[0.180]	[0.181]	[0.178]	[0.174]
Observations	1330	1330	1330	1330	1330	1330	1330	1330	1330
R squared	0.598	0.602	0.598	0.599	0.602	0.600	0.599	0.600	0.614

Notes: This table examines the robustness of the main results for population, likin, and charities when controlling for variables on other historical events. Column (1) presents the baseline results. In Columns (2)–(8), we sequentially add one control variable at a time, each interacted with year indicators: an indicator for Guangxu drought, an indicator for Hui revolts, the number of battles during several episodes (the Nian Rebellion, the ROC 1912–1937, the Sino-Japanese War, and the Chinese Civil War), and the number missionary activities in the 1860s. In the last column, we control for all variables. Only the estimation results for the key variables are reported. Standard errors are clustered at the prefecture level for Panels A, C, and D and at the provincial level for Panel B. For Panel B, statistical inference is performed following the wild bootstrap-*t* procedure recommend by Cameron et al. (2008).

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

Table B2. Taiping Rebellion and Modern Outcomes: Controlling for Other Historical Events

Dependent variable:	Log ag & ind. output per capita (1982) (1)	% Middle school graduates (1982) (2)	% Literate population (1982) (3)	Log avg. years of schooling (2000) (4)	Log GDP per capita (2010) (5)	Log fiscal revenue per capita (2010) (6)
Panel A.						
Taiping	0.269***	0.006	-0.013	0.018	0.050	0.412***
	[0.090]	[0.007]	[0.018]	[0.015]	[0.103]	[0.157]
Ln (Jinshi$_{1793\text{-}1820}$)	0.160***	0.008***	0.021***	0.015*	0.083	0.171***
	[0.037]	[0.003]	[0.008]	[0.008]	[0.052]	[0.057]
Ln (pre-TP wars)	0.042	-0.005	-0.007	-0.020	-0.156	-0.251
	[0.109]	[0.007]	[0.018]	[0.021]	[0.106]	[0.157]
Controls	Y	Y	Y	Y	Y	Y
Other historical events	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
R-squared	0.471	0.488	0.442	0.502	0.440	0.455
Panel B.						
Early Taiping	0.147	-0.005	-0.023	0.013	-0.145	0.171
	[0.094]	[0.007]	[0.019]	[0.017]	[0.108]	[0.176]
Late Taiping	0.654***	0.039***	0.019	0.033	0.607***	1.100***
	[0.168]	[0.013]	[0.028]	[0.028]	[0.166]	[0.219]
Ln (Jinshi$_{1793\text{-}1820}$)	0.172***	0.009***	0.022***	0.016*	0.099*	0.191***
	[0.037]	[0.003]	[0.008]	[0.008]	[0.053]	[0.057]
Ln (pre-TP wars)	0.034	-0.006	-0.008	-0.020	-0.175*	-0.275*
	[0.114]	[0.007]	[0.018]	[0.021]	[0.103]	[0.160]
Controls	Y	Y	Y	Y	Y	Y
Other historical events	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
R-squared	0.499	0.521	0.447	0.503	0.489	0.499
Panel C.						
Early Taiping	0.101	-0.014**	-0.050**	-0.017	-0.207*	0.205
	[0.096]	[0.007]	[0.019]	[0.016]	[0.106]	[0.173]
Late Taiping	0.495***	0.030**	-0.014	-0.004	0.407**	0.966***
	[0.156]	[0.013]	[0.028]	[0.028]	[0.170]	[0.236]
Ln (Jinshi$_{1793\text{-}1820}$)	0.160***	0.011***	0.027***	0.022***	0.078	0.139**
	[0.040]	[0.003]	[0.008]	[0.008]	[0.053]	[0.061]
Ln (pre-TP wars)	0.046	-0.006	-0.007	-0.019	-0.159*	-0.255*
	[0.112]	[0.007]	[0.017]	[0.019]	[0.096]	[0.153]
Ln (Likin$_{1880}$)	0.022	0.004***	0.013***	0.014***	0.027	-0.019
	[0.021]	[0.002]	[0.004]	[0.004]	[0.020]	[0.021]
Ln (Charity$_{1880\text{-}1941}$)	0.113**	-0.000	0.008	0.009	0.162***	0.185***
	[0.047]	[0.003]	[0.008]	[0.009]	[0.049]	[0.063]
Controls	Y	Y	Y	Y	Y	Y
Other historical events	Y	Y	Y	Y	Y	Y
Observations	191	191	191	191	185	185
R-squared	0.529	0.550	0.493	0.558	0.536	0.528

Note: Control variables include the (log) distances to the Yangtze River and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of palace scholars (*jinshi*) from 1793–1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk producing prefectures, and the number of wars before Taiping rebellion. The additional controls for other historical events include an indicator for Guangxu drought, an indicator for Hui revolts, the number of battles during several episodes (the Nian Rebellion, the ROC 1912–1937, the Sino-Japanese War, and the Chinese Civil War), the number missionary activities in the 1860s, and the population share of deaths due to violence during the Cultural Revolution. Only the estimation results for key variables are reported. Standard errors are robust.
*** p<0.01, ** p<0.05, * p<0.1.

Table B3. Taiping Rebellion, Interpersonal Trust, and Civic Engagement: Controlling for Other Historical Events

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Trust in Relatives	Trust in Friends	Trust in Coworkers	Attention to Politics	Engagement in Local Affairs
Early Taiping	0.269***	0.158***	0.112*	-0.073**	-0.008
	[0.060]	[0.059]	[0.065]	[0.029]	[0.035]
Late Taiping	0.145**	0.156**	0.201***	0.083*	0.069*
	[0.072]	[0.068]	[0.063]	[0.048]	[0.041]
Observations	6416	6404	6123	6406	6415
R-squared	0.033	0.033	0.032	0.299	0.049
Baseline controls	Y	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y	Y
Other historical events	Y	Y	Y	Y	Y

Note: All regressions control for log distances to the Yangtze and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of *jinshi* from 1793 through 1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk production, and the number of wars prior to the Taiping Rebellion. Individual-level covariates include indicators for gender, educational attainment, age, urban residence, employment status, marital status, and membership of the Chinese Communist Party. The additional controls for other historical events include an indicator for Guangxu drought, an indicator for Hui revolts, the number of battles during several episodes (the Nian Rebellion, the ROC 1912–1937, the Sino-Japanese War, and the Chinese Civil War), the number missionary activities in the 1860s, and the population share of deaths due to violence during the Cultural Revolution. Robust standard errors clustered at the prefecture level are reported in brackets.
*** p<0.01, ** p<0.05, * p<0.1.

Table B4. Taiping Rebellion and Great Chinese Famine (1959–1961): Controlling for Other Historical Events

	Dependent variable: Famine Control		
	(1)	(2)	(3)
Taiping	0.069***		
	[0.021]		
Early Taiping		0.066***	0.063**
		[0.025]	[0.024]
Late Taiping		0.079**	0.076**
		[0.033]	[0.033]
Political Radicalism (i.e., -PMD)			-0.019
			[0.017]
Ln ($Jinshi_{1793–1820}$)	-0.011	-0.011	-0.013
	[0.011]	[0.011]	[0.010]
Ln (Pre-TP wars)	0.006	0.006	0.010
	[0.030]	[0.030]	[0.032]
Controls	Y	Y	Y
Other historical events	Y	Y	Y
Observations	164	164	164
R-squared	0.392	0.392	0.398

Note: The dependent variable is "famine control"—a higher value means a lower famine severity. All regressions control for log distances to the Yangtze and to the coastline, log population in 1820, log land tax rate per mu in 1820, log number of *jinshi* from 1793–1820, dummies for prefecture importance classification by Qing government, dummies for tea and silk production, and the number of wars prior to Taiping rebellion. The additional controls for other historical events include an indicator for Guangxu drought, an indicator for Hui revolts, the number of battles during several episodes (the Nian Rebellion, the ROC 1912–1937, the Sino-Japanese War, and the Chinese Civil War), and the number missionary activities in the 1860s. Robust standard errors are reported in brackets.
*** p<0.01, ** p<0.05, * p<0.1.

C. Robustness: Taiping Regime vs. Taiping Conquest

In this section, we isolate prefectures that experienced the Taiping Army's conquest but were never under the Taiping rule from the control group. We estimate the following regression model, modified from equation (1):

$$Y_{it} = \sum_{\tau \neq 1820} \alpha_\tau (D_\tau \times Taiping_i) + \sum_{\tau \neq 1820} \theta_\tau (D_\tau \times Taiping\ Conquest_i) + Controls + \rho_t + \eta_i + e_{i,t}. \quad \text{(C1)}$$

The outcome variable Y_{it} can be log population, log *likin* intensity plus one, or log charities plus one. Depending on the outcome examined, $Controls$ includes the same set of covariates used in the preferred specification presented in the main text. $Taiping\ Conquest_i$ is a dummy variable that equals one if prefecture i had experienced the Taiping Army's conquest but was never under the Taiping rule.

Table C1 reports the results. To ease comparison, for each outcome, we first replicate the preferred specification and then estimate equation (C1). One can see that accounting for the Taiping conquest's influence does not alter our conclusions: the rebellion reduced population growth, with the adverse effect larger in Early Taiping areas; the rebellion increased *likin* revenue but the effect is more pronounced in Late Taiping areas; and the rebellion increased local charities only in Late Taiping areas.

Table C1. Taiping Regime vs. Taiping Conquest

	Log population		Log population (Early vs. Late)		Log 1 + likin per 1000 km^2		Log 1 + charities	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Taiping*Year 1851	-0.004	-0.015						
	[0.020]	[0.019]						
Taiping*Year 1880	-0.454***	-0.463***						
	[0.093]	[0.100]						
Taiping*Year 1910	-0.438***	-0.464***						
	[0.091]	[0.094]						
Taiping*Year 1953	-0.513***	-0.556***						
	[0.095]	[0.096]						
Taiping*Year 1982	-0.443***	-0.494***						
	[0.086]	[0.090]						
Taiping*Year 2000	-0.428***	-0.478***						
	[0.091]	[0.094]						
Early Taiping*Year 1851			-0.005	-0.016			-0.042	-0.036
			[0.020]	[0.018]			[0.072]	[0.075]
Early Taiping*Year 1880			-0.446***	-0.455***	2.230*	2.707*	0.056	0.063
			[0.100]	[0.105]	[0.631]	[0.781]	[0.108]	[0.117]
Early Taiping*Year 1910			-0.425***	-0.451***	1.371**	1.557**	0.051	0.046
			[0.094]	[0.097]	[0.399]	[0.388]	[0.114]	[0.125]
Early Taiping*Year 1953			-0.556***	-0.596***	1.025*	1.118*	0.022	0.018
			[0.100]	[0.102]	[0.298]	[0.348]	[0.113]	[0.126]
Early Taiping*Year 1980			-0.472***	-0.520***				
			[0.091]	[0.095]				
Early Taiping*Year 2000			-0.449***	-0.496***				
			[0.096]	[0.099]				
Late Taiping*Year 1851			0.005	-0.008			0.166*	0.173*
			[0.035]	[0.035]			[0.092]	[0.094]
Late Taiping*Year 1880			-0.500**	-0.513***	3.120**	3.678**	0.427***	0.435***
			[0.194]	[0.198]	[0.457]	[0.631]	[0.158]	[0.165]
Late Taiping*Year 1910			-0.510***	-0.544***	2.626**	2.843***	0.557***	0.550***
			[0.163]	[0.164]	[0.315]	[0.302]	[0.175]	[0.185]
Late Taiping*Year 1953			-0.312**	-0.361**	1.922**	2.030**	0.577***	0.571***
			[0.142]	[0.142]	[0.273]	[0.334]	[0.181]	[0.191]
Late Taiping*Year 1980			-0.314**	-0.372**				
			[0.142]	[0.144]				
Late Taiping*Year 2000			-0.338**	-0.395***				
			[0.151]	[0.152]				
Taiping conquest*Year 1851		-0.024*		-0.024*				0.013
		[0.013]		[0.013]				[0.041]
Taiping conquest*Year 1880		-0.014		-0.016		1.213		0.016
		[0.075]		[0.075]		[0.802]		[0.062]
Taiping conquest*Year 1910		-0.051		-0.054		0.472		-0.011
		[0.073]		[0.073]		[0.270]		[0.069]
Taiping conquest*Year 1953		-0.083		-0.080		0.236		-0.008
		[0.067]		[0.067]		[0.220]		[0.069]
Taiping conquest*Year 1982		-0.098		-0.096				
		[0.064]		[0.064]				
Taiping conquest*Year 2000		-0.096		-0.095				
		[0.065]		[0.065]				
Observations	1862	1862	1862	1862	1064	1064	1330	1330
R squared	0.794	0.795	0.796	0.796	0.904	0.907	0.598	0.598

Notes: This table examines the robustness of the main results for population, *likin*, and charities when we extend the baseline specification by isolating from the control group the prefectures that the Taiping Army conquered but did not establish a regime. This group of prefectures are denoted by a "Taiping conquest" dummy. The control variables include time-varying variables are time-invariant variables (interacted with period indicators). For each super column, we first replicate the baseline results (Columns (1), (3), (5), and (7)), and then we present the results from the extended specification that additionally includes the Taiping conquest dummy interacted with year indicators while keeping other control variables unchanged (Columns (2), (4), (6), and (8)). For *likin* results, year 1880, 1910, and 1953 mean periods 1869–1879, 1880–1908, and 1922–1925. Only the estimation results for the key variables are reported. For *likin* results, standard errors are robust and clustered at the provincial level; otherwise, standard errors are clustered at the prefecture level.

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

D. Robustness: Own Treatment vs. Adjacent Treatment

In this section, to explicitly account for spatial spillovers, we isolate control prefectures adjacent to Taiping prefectures from the control group. We estimate the following regression model, modified from equation (1):

$$Y_{it} = \alpha(Post_t \times Taiping_i) + \pi(Post_t \times NeighborTaiping_i) + Controls + \rho_t + \eta_i + e_{i,t}. \quad \text{(D1)}$$

The outcome variable Y_{it} can be log population, log *likin* intensity plus one, or log charities plus one. Depending on the outcome examined, $Controls$ includes the same set of covariates used in the preferred specification presented in the main text. $NeighborTaiping_i$ is a dummy variable that equals one if prefecture i neighbored a prefecture under the Taiping rule. When examining *likin* and charities, we distinguish between Early and Late Taiping rules. To improve readability of results, we report the static difference-in-differences estimates rather than the dynamic estimates. $Post_t$ is a dummy variable that equals one for years/periods after 1851.

Table D1 reports the results. One can see that accounting for the spillovers from Taiping neighbors does not alter our conclusions about the treatment effects of the rebellion. If anything, it accentuates our findings.

Table D1. Own Taiping Treatment vs. Adjacent Taiping Treatment

	Log population				Log *likin* per 1000 km^2		Log charities	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Taiping*Post	-0.453***	-0.542***						
	[0.081]	[0.084]						
Early Taiping*Post			-0.465***	-0.525***	1.542**	1.891**	0.065	0.125
			[0.087]	[0.089]	[0.377]	[0.390]	[0.086]	[0.090]
Late Taiping*Post			-0.395***	-0.443***	2.556**	2.959***	0.438***	0.509***
			[0.140]	[0.140]	[0.303]	[0.305]	[0.140]	[0.144]
Neighbor Taiping*Post		-0.194***						
		[0.069]						
Neighbor Early Taiping*Post				-0.284***		1.150***		0.068
				[0.071]		[0.341]		[0.058]
Neighbor Late Taiping*Post				0.192**		0.072		0.180*
				[0.076]		[0.336]		[0.095]
Observations	1862	1862	1862	1862	1064	1064	1330	1330
R squared	0.957	0.957	0.957	0.958	0.912	0.914	0.972	0.972

Notes: This table examines the robustness of the main results for population, *likin*, and charities when we extend the baseline specification by isolating from the control group the prefectures that neighbored a Taiping/Early Taiping/Late Taiping prefecture. To ease comparison and presentation, we estimate static difference-in-differences specifications where a *Treatment*Post* term (*Post* = 1 for periods from 1880 onward) replaces *Treatment*Year* terms. The control variables include time-varying variables are time-invariant variables (interacted with period indicators). For each super column, we first replicate the baseline results (Columns (1), (3), and (5)), and then we present the results from the extended specification that additionally includes the Neighbor Taiping/Early Taiping/Late Taiping dummies interacted with year indicators while keeping other control variables unchanged (Columns (2), (4), and (6)). Only the estimation results for the key variables are reported. For likin results, standard errors are robust and clustered at the provincial level; otherwise, standard errors are clustered at the prefecture level.

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

E. Robustness: Dropping One Province at a Time

In this section, we examine if our results are driven by any regional heterogeneity. Specifically, we leave out control prefectures of a province at a time, and then estimate the following regression:

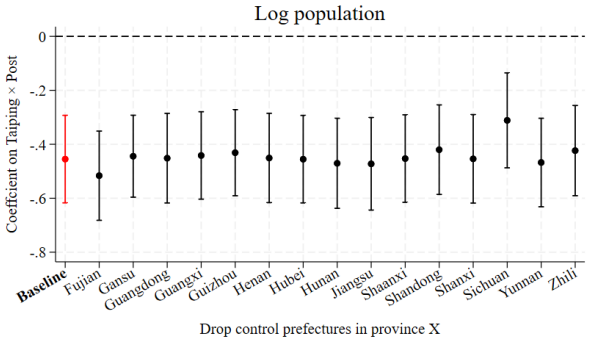
$$Y_{it} = \alpha(Post_t \times Taiping_i) + Controls + \rho_t + \eta_i + e_{i,t}. \qquad \text{(E1)}$$

The outcome variable Y_{it} can be log population, log *likin* intensity plus one, or log charities plus one. Depending on the outcome examined, $Controls$ includes the same set of covariates used in the preferred specification presented in the main text. When examining *likin* and charities, we distinguish between Early and Late Taiping rules. Because there are many provinces, to improve readability of results, we report the static difference-in-differences estimates rather than the dynamic estimates. $Post_t$ is a dummy variable that equals one for years/periods after 1851.

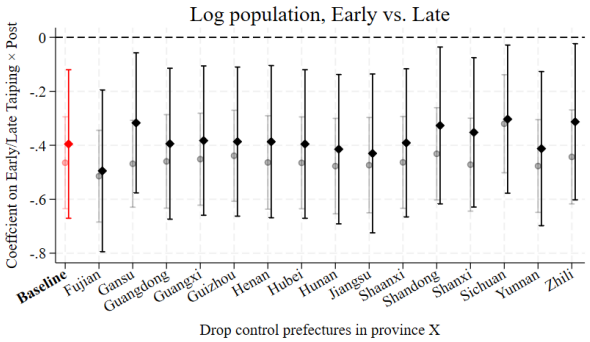
Figure E1 reports the results. Our key results survive: the rebellion reduced population growth; the rebellion increased *likin* revenue but the effect is more pronounced in Late Taiping areas; and the rebellion increased local charities only in Late Taiping areas.

Figure E1. Leaving Out One Province at a Time

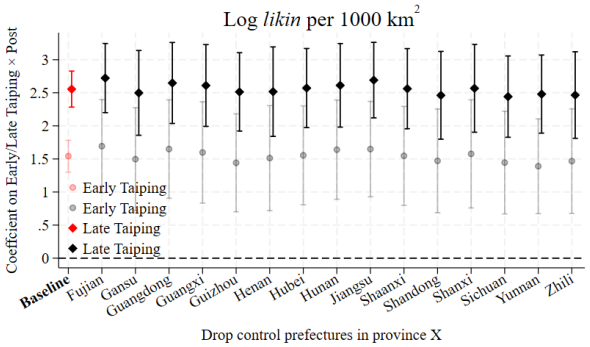
(a) Results for Population



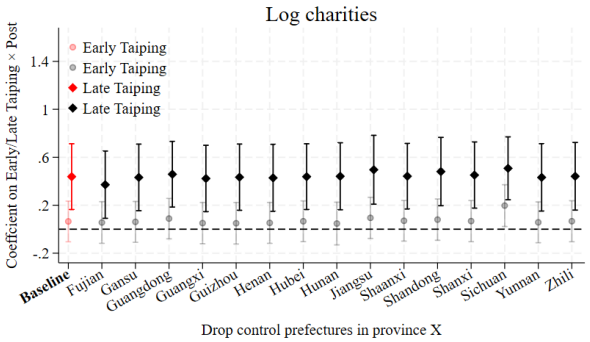
(b) Results for Population, Early vs. Late Taiping



(c) Results for *Likin*



(d) Results for Charities



Note: This figure examines the robustness of our main results for population, *likin*, and charities when excluding control prefectures of a particular province at a time. To ease comparison and presentation, we estimate static difference-in-differences specifications where a *Treatment*Post* term (*Post* = 1 for periods from 1880 onward) replaces *Treatment*Year* terms. The solid points represent point estimates, and the caps are 95% confidence intervals.