Property Rights, State Capacity, and Social Capacity: The Lasting Impacts of the Taiping Rebellion*

Weizheng Lai	Lixin Colin Xu	Li Yang
University of Maryland	CKGSB	DIW Berlin

Abstract. We study the impacts on development of the Taiping Rebellion (1850-1864), one of the deadliest civil wars in human history and a key turning point of China toward modernity. We find that the rebellion experience, on the margin, had positive impacts in *some* areas, as captured by a range of outcomes, including better land property rights, improved local fiscal capacity, enhanced social capacity, stronger political efficacy, as well as fewer deaths during the Great Famine (1959-1961). We also find empirical support for the complementarity between state capacity and social capacity. The results suggest that the effects of violent conflicts on local state capacity and social capacity could partly explain large within-country variation in development.

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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 causal mechanisms nevertheless 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."

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), perhaps the deadliest civil war in human history, and a critical juncture on China's road to modernity. 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."[2] To deal with the threat posed by the rebellion, the weak central government had to enact decentralization, granting local leaders unprecedented control over local militias and public finance. This led to a series of fundamental changes in China's evolution: it strengthened regional power, thus constraining the central government's power (Fairbank 1992); and it also facilitated the formation new 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 associated causal mechanisms for several reasons. *First*, China exhibits huge variation in local institutions and in economic performance between regions (Fang et al. 2023). 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 pales in comparison to the counterpart ratio in China: GDP per capita in Dongguan City was 27 times that of Tianshui City in 2010. In terms of institutions, the influence of Confucian clan culture also varies greatly between regions (Chen, Ma, and Sinclair 2022). *Second*, the rebellion led to rich regional variation in the institutional and social arrangements that are of relevance to long-term development. For example, the protection of property rights diverged greatly across the rebel-occupied areas. On the Qing side, fiscal power became decentralized, causing large variation in regional fiscal capacity. In some regions, charity organizations sprang up under the leadership of local elites after the rebellion. Such rich variation offers an opportunity for us to shed light on why regions differ in development under the same national-level institutions.

[1] See also Collier (1998), Acemoglu et al. (2011), Michalopoulos and Papaioannou (2011), and Dell (2012).
[2] The Taiping Rebellion led to 20–30 million casualties (Ho, 1959). By way of comparison, approximately 620,000 casualties were suffered during the American Civil War (1864-1865).

Third, relative to cross-country studies on the consequences of conflict, an analysis that relies on sub-national units in China offers distinct methodological advantages. Cross-country studies of war often suffer from data selectivity problems: war-torn countries generally have poorer-quality data; the worst-hit countries are less likely to be represented, hiding evidence of the impact of wars in the very areas where wars have taken the greatest toll. In our case, an analysis of data at the sub-national level allows us to obtain insights on the effects on both war-torn and other areas. Moreover, our data span one-and-a-half centuries, thus promising to generate insights concerning the long-term impacts of one of the largest civil wars in history. The analysis of sub-national units within China has another unique feature: China is one of the largest territories in the world, and it is also the country with the longest history of centralized state (Zhao, 2015), but its society has been much weaker (Acemoglu and Robinson, 2020). An analysis of how decentralization (here, induced by the Taiping Rebellion) affected regional development in such a unique setting is thus of particular importance.

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*, since the protection of land property rights was better in the areas that the rebels conquered in the late stage (i.e., around 1860 and later; labeled as "Late Taiping" areas) than in those conquered 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 finance local elites in their fight against the rebels, the Qing government instituted drastic fiscal decentralization using a new form of tax called *likin*. We examine whether this fiscal decentralization led to strengthened state capacity, as measured by *likin* revenue, and whether stronger local state capacity ultimately resulted in better provision of public goods and improved long-term development in a region (Besley and Persson 2009). We call this the "*likin*-as-state-capacity hypothesis." *Third*, since local elites led the fight against the Taiping rebels and the post-war recovery, some regions witnessed a flourishing of charity organizations under their leadership, which motivates us to investigate the long-term impacts of the development of social capacity, which is the capacity of the society to get things done collectively, including constraining the government and/or making the society more powerful. To the extent that social capacity, represented by charity organizations, enhanced trust and social capital, as well as facilitated social mobilization to strengthen society power, it stands to reason that social capacity could act as an important constraint on state power, thus facilitating more balanced and sustainable long-term development (Acemoglu and Robinson 2019). We call this the "social change hypothesis." Also, the stronger social capacity in selected Taiping regions may have encouraged social cohesion and civic engagement. We call this the "social cohesion and political engagement

hypothesis." In a related vein, several prominent scholars have emphasized the importance of *joint* development of state capacity and social capacity for sustainable development (Besley and Persson 2009; Acemoglu and Robinson 2019). Our long-term data allow us to test this "state-society-complementarity hypothesis."

We examine these hypotheses by analyzing rich prefecture-level data in China. Some of the prefectures were controlled by the Taiping Army during the rebellion. We examine population levels from 1820 to 2000, and the development of local charities after the rebellion. We also examine long-term development outcomes, including modern-day income levels, fiscal capacity, industrialization, and human capital, as well as social trust, political engagement, and deaths from the Great Famine of 1959-1961. When examining population, we use a difference-in-difference (DID) approach to estimate differences in population growth rates (relative to the base period) between rebel-occupied and unoccupied prefectures. To consider pre-treatment differences between occupied and unoccupied regions, following previous literature with similar historical data in China (Xue 2021), we rely on propensity score matching based on pre-treatment characteristics to select a comparable set of prefectures for our empirical analysis throughout the paper. To further address potential omitted-variables biases and measurement errors, we use an instrumental variable (IV) approach. Our IV strategy takes advantage of the spatial military strategy adopted by the rebel leaders, who aimed to use their initially superior naval force to take mid-Yangtze River cities first, and then to move eastward along the river to expand to adjacent areas. The longitude thus serves as a valid IV for the influence of the Taiping Rebellion after controlling for other geographic factors, such as distance to the coast. When examining the long-term impact of the rebellion on modern outcomes, we rely on cross-sectional regressions using the matched sample. We also examine the robustness of our key results when allowing for spatial interactions, which might be relevant for research on long-term persistence (Kelly 2019).

We obtain several findings regarding the rebellion's impacts on the evolution of population, local state capacity, and social capacity. *First*, the Taiping Rebellion had a significant impact on patterns of population in rebel-occupied areas, inducing permanent population losses in the Early Taiping areas, but not in the Late Taiping areas that featured better land property rights. In the post-rebellion decades and relative to the unoccupied prefectures, land remained idle to a greater extent in the Early Taiping areas, but not in the Late Taiping areas. This is consistent with the property rights hypothesis that the Late Taiping areas offered better protection of land property rights. *Second*, the local governments in the Taiping regions collected higher tax (*likin*) revenue in subsequent decades, especially in the Late Taiping areas. This suggests that the rebellion strengthened local fiscal capacity. *Third*, selected rebellion regions experienced significant social transformation, as captured by the number of charity organizations. The Taiping regions on average

did not experience significant social transformation, but the Late Taiping regions experienced stronger social transformation.

We also obtain several findings on the rebellion's long-term impacts. *First*, relative to non-Taiping regions, the Taiping regions on average do not have stronger development, aside from having higher modern-day fiscal revenues. However, the Late Taiping regions have income levels that are 71 percent higher, and per-capita fiscal revenues that are 165 percent higher, consistent with the property rights hypothesis. Second, higher post-rebellion *likin* intensity is associated with the improved provision of public goods today, consistent with the *likin*-as-state-capacity hypothesis that improved fiscal capacity due to war can augment long-term public good provisions. *Third*, an important channel for the Late Taiping effects is social transformation, since the Late Taiping effects, although still strong, are significantly attenuated once the number of post-rebellion charities is held constant. The post-rebellion number of charities itself is significantly associated with most key aspects of long-term development, including income, fiscal capacity, industrialization, and human capital, consistent with the social change hypothesis that strong social capacity facilitates long-term development. *Fourth*, *likin* had more pronounced effects on long-term development in regions with a greater number of charity organizations, consistent with the hypothesis that state capacity and social capacity are complementary, as emphasized in the recent literature (Besley and Persson 2009; Acemoglu and Johnson 2019).

Fifth, we also find that the experience of Taiping Rebellion appears to have had impacts on modern-day social trust, civic engagement, political efficacy, as well as the severity of the Great Famine around 1960. To begin with, based on modern social surveys, we find that individuals in the Taiping areas, on average, exhibit higher trust in their personal network (i.e., relatives, friends, and coworkers), but lower trust in government cadres. The rebellion experience facilitated cooperation and trust in one's own networks primarily in the Late Taiping areas, where local elites led the fight. However, in the rebellion areas featuring weaker protection of property rights by local governments (i.e., the Early Taiping areas), the rebellion experience is associated with lower trust in government. Moreover, people in the Late Taiping areas have significantly stronger *political confidence* (about 50 percent more pronounced) than those in the Early Taiping areas, partly because the Late Taiping regions had a stronger development of social capital, which is by itself associated with stronger political confidence. In the Late Taiping areas, people are also more engaged in local public affairs. Finally, the Great Famine, caused by central planning failures and political radicalism around 1960, was significantly less severe in the Taiping areas. Specifically, the Taiping areas had a 21 percent reduction in the severity of the famine, and the reduction is more pronounced in the Late Taiping regions that featured stronger property right protection and development of social capacity. Indeed, rich social capital, as captured by the flourishing of charity

organizations in the Late Taiping areas, appears to have reduced the damage in terms of famine deaths caused by political radicalism.

In short, the body of evidence suggests that while the rebellion itself was clearly a disaster, insofar as it led to favorable changes in institutions, state capacity, and social capacity in *selected* areas, it facilitated ensuing economic and social development.

Our paper contributes to several strands of literature. The first concerns the long-run impact of wars (see Blatterman and Miguel 2010 for a survey), to which we add novel findings. This literature has examined how countries recover after large historical shocks, such as major wars.[3] We add to this literature by showing that wars sometimes can facilitate long-term development in selected regions, partly via the mechanisms of state 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 state capacity, social capacity, long-term income levels, fiscal capacity, industrialization, human capital, modern-day political and social attitudes, as well as how people contained the Great Famine. Understanding the long-term impacts of this monumental war 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) estimate 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 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 impacts on social trust, civic engagement, and the collective handling of central planning disasters. Similarly, no existing studies consider the mechanisms examined in our paper: property rights, state capacity, social capacity, and modern political and social beliefs.

Our 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), 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 land property rights, state capacity, social capacity, and social and political beliefs, while offering evidence that some of

[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).

these channels, such as state capacity and social capacity, are complementary.

Finally, our paper is related to the literature on state capacity, social capacity, and development. This 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, the role of wars in facilitating state capacity, the complementarity between fiscal and institutional capacities (Acemoglu 2005; Besley and Persson 2009, 2010; Dincecco and Wang 2022), and the complementarity between state and social capacities. In this vein, Acemoglu and Robinson (2019) coined the phrase "Red Queen effects" to emphasize the parallel growth of both state and society capacities as *the* key to the long-term prosperity of nations.[4] There is also a large literature on state building in mostly European countries,[5] which finds that a rise in state capacity stemming 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 strengthening of state capacity is accompanied by increasing executive constraints, which facilitate compliance with tax collection 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 add to this literature by showing that the Taiping Rebellion facilitated state capacity, but via fiscal *decentralization* rather than fiscal *centralization*, as is typical in the literature (Dincecco 2015, Hoffman 2015; Koyama, Moriguchi, Sng 2018). We suspect that fiscal decentralization resulting from the rebellion achieved two things: the strengthening of local state capacity and local social capacity, both of which increased checks on the power of the central government. Moreover, we provide novel evidence that the rebellion also facilitated the development of charities, which has positive long-term impacts on income levels and fiscal capacity one-and-half centuries later; and we provide evidence that, consistent with Besley and Persson (2009) and Acemoglu and Robinson (2019), state capacity and social capacity are complementary in facilitating long-term development. In this respect, our study complements Xue (2021), who finds that the development of charities in Qing China affects generalized trust and political participation today. Furthermore, we show that the rebellion experience, especially in the Late Taiping areas that had stronger property rights as well as social development, was associated with stronger trust in personal networks, higher political efficacy, as well as better handling of top-down central planning disasters. Finally, scholars have increasingly viewed China as a polar case of strong state with a weak society (Acemoglu and Robinson 2019; Huang, 2023; Shirley and Xu,

[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).

forthcoming). We offer novel evidence that indeed in such a state-society-unbalanced setting, improving social capacity has broad benefits as shown by the complementarity between state capacity and social capacity and the role of social capital in containing the damage of the Great Famine.

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 Taiping Rebellion's impacts on population and local taxation (Section IV), the impacts on property rights and fiscal capacity (Section V), the impacts on social capital (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 population levels, land property rights, local state capacity, as well as local social change; we then discuss potential long-term consequences.

The Taiping Rebellion, lasting from 1850 to 1864, unfolded against the backdrop of fundamental economic and demographic changes. In the century prior to the rebellion, the cultivated land area of the Qing Empire stagnated while the population tripled (Wu 1950), leading to strong population pressures. Moreover, record-low temperatures led to severe natural disasters. Western powers encroached significantly on Chinese sovereignty. The Nanjing Treaty, which was signed after the loss of the Opium War to Great Britain in 1842, made Shanghai a major port for foreign trade, taking away a large share of port businesses and customs income in Guangdong Province. In addition, located furthest from the capital Beijing, Guangdong and Guangxi provinces were subject to the weakest central control while also experiencing strong adverse trade shocks. All these factors contributed to the rebellion there (Miguel et al. 2004).

The rebellion led to the establishment of the Taiping Heavenly Kingdom (TPHK), with its capital at Nanjing. During its reign, the TPHK controlled the southern provinces of Jiangsu, Anhui, Hubei, Jiangxi, and Zhejiang. Its control over these areas was *incomplete*: some were controlled by the TPHK while others by the Qing government, and the control of these areas frequently changed hands. The rebellion had tragic and devastating impacts on population levels. The war affected 18 provinces and resulted in many casualties; together with plague deaths, some 20-30 million people perished (Ho 1959, pp. 246-247; Cao 2001, p. 553). Aside from these consequences for population, the rebellion had other lasting impacts, including effects on regional land property rights,

decentralization, fiscal capacity, and social change. In the following sections, we sketch these impacts and formulate our hypotheses regarding their implications for development. Figure 1 offers a graphical summary of the hypotheses that we have derived.

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 landowners, who collected rents from tenant farmers. The empire protected the rights of landowners to ensure that tenant farmers paid their rents (Guo 1991, p. 238). The rebellion changed *de facto* (and sometimes *de jure*) land ownership. Though the TPHK proposed an egalitarian redistribution of land, this policy was *not* implemented due to the lack of capacity and the need to collect taxes to finance the war (Bernhardt 1987).[6] Nevertheless, the rebellion disrupted the *status quo* of land ownership.

The method used by the Taiping government to collect land taxes changed over time. Guo (1991) documents that tax collection methods differed in the areas that the Taiping Army occupied early on (i.e., up to 1859, hereafter referred to as the "Early Taiping" areas) and those that the Taiping Army occupied in later years (i.e., from 1860 to the end of war, hereafter referred to as "Late Taiping" areas). In the early stage, the 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 through looting, confiscation, and contributions from residents in conquered areas, but not from land taxes (Wu 1950; Gu 2006). Starting in 1854, the Taiping Army's land policy was to continue the land system used in the Qing Empire, and to collect the land tax from the landlord as usual (Bernhardt 1987, p. 394). Nevertheless, the old land system was destroyed because landlords were repressed, and most land title deeds were lost. Moreover, the anti-rent movement made landlords unable to collect enough rents to cover their tax liabilities.[7] 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 make tenant farmers vulnerable to expropriation, and discourage investment in maintaining land quality, land improvement, and reclamation of idle land. Before the rebellion, these investments would have been undertaken by the landlords. This

[6] A more cynical view would argue that the TPHK merely tried to use it as a slogan to attract recruits.

[7] 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 after the war.

under-investment effect likely persisted both in the short run and in the long run. In the short run, farmers would over-farm, thereby eventually resulting in more idle land. Lack of 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 policy and its effects likely persisted when the Qing government restored control. After the rebellion's failure, a large share of landlords and land ownership deeds disappeared. If cultivating tenants did not have a clear sense of ownership, farmers would be less willing to reclaim arable land that became idle during the war. Therefore, ambiguous property rights and associated adverse effects would be 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. At this stage, the Taiping Army urgently needed war financing, as the Qing-backed armies and militias had beefed up their counterattacks, and the cost of purchasing modern weapons rose dramatically because the British assisted the Qing 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 set the new land policies, behaving more like stationary bandits who have a long-term view to expand the tax base and to encourage production and investment (Olson 1993).

In 1860, the Taiping leaders experimented with policies to collect land taxes in the new territory. Beginning with "landlord registration and payment" similar to the Qing *status quo* policy, they soon discovered its inadequacy in inducing landlord compliance. The leaders promptly switched to direct tenant payment (i.e., directly collecting taxes based on cultivation, or 作佃交粮), which quickly proved to be successful, and, as a result, was widely adopted in the new territory (Bernhardt 1987; Guo 1991, p. 258-272). Here *cultivators* were urged to register their land. They complied readily because, consistent with the idea that Taiping officials acting as stationary bandits, the implied tax rate was lower under this policy than that under the Qing (Luo 1955, p. 208). 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 became mandatory, 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 on, Taiping leaders started issuing new land deeds in some prefectures in Jiangsu and Zhejiang. As a result, a large share of tenant farmers were 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 often *de jure*) landowners, which facilitated tax compliance.

Being *de facto* (and often *de jure*) landowners, tenant farmers in the Late Taiping areas would treat their lands as their own, and invest adequately in land improvement, including reclaiming idle land. Since labor efforts are critical inputs for land output, 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 would 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 rights acquired during the rebellion. The war experience likely enhanced the ability of the peasants 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 its 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 would expect better long-term development in the Late Taiping areas. Note that this clarification of property rights meant an advantage for Late Taiping areas relative to that of Early Taiping areas. There is no strong reason to assume that the property rights definition in the Late Taiping region has 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 should have a lower share of idle land. As a result, the Late Taiping areas should also have faster post-war population recovery, and better long-term development.

II.2 War financing and state capacity

The rebellion led the Qing Dynasty to reform its tax collection practices. Specifically, to finance the war effort, taxing was decentralized to local elites and officials, especially in places with strong need to fight the rebels. The Qing government had to decentralize taxing 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 this regard, the key reason for the weak fiscal capacity was the large size of the territory size and widespread corruption (Sng 2014; Koyama, Moriguchi, and Sng 2018). To

prevent rebellions, the emperors had to limit the effective tax burdens imposed on peasants. The huge territory resulted in costly and ineffective monitoring of (remote) local officials, who took large bribes and gave tax waivers. As a result, the Qing government set a low tax rate and collected limited fiscal revenue. With its weak fiscal capacity, the Qing Army simply had no means to contain the Taiping rebels.

Fatally threatened by the Taiping rebels without effective resistance from the official Qing Army, the Qing government encouraged local gentry and officials to raise and/or expand local militias, a fairly common practice 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).[8] There were basically two types of *likin*. The first was a transit tax, levied on the transport of goods by travelling merchants. The travelling merchants could be taxed either multiple times or only taxed at the start and end points of travel. The second type of *likin* was a business tax on the sales of goods by resident merchants in the marketplace or the store of a workshop; it is levied on 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., one-time levies 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 the early Republican era until 1931, thus lasting close to a century. The implementation of *likin* was decentralized. Each province organized the tax according to its needs. This was reflected in the non-uniform rate across provinces, ranging from 1.2% in Hubei to 3–4% in Shanghai on commodities. As time passed, business taxes became the main type of *likin*. Indeed, in the last half century of Qing, the general commodity tax accounted for 92 percent of *likin* tax revenues (Peng, 1992). A key consequence of *likin* taxation was that local governments' tax administration became substantially strengthened: *likin* collection was initially organized by the military agencies, but gradually it was performed by specialized *likin* bureaus. This building-up of local fiscal capacity, as we shall see later, would greatly facilitate some areas' development.

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). Indeed, the amount of local *likin* revenue was 3 to 4 times as much as the income collected by the central government at the end of the Taiping Rebellion (Peng 1992). This fiscal decentralization reversed the millennium-long tradition of centralization in China since the Qin Dynasty (starting 221 BCE, with some interruptions between the Han and the Sui Dynasties; see Huang, 2023, p. 243-245), and

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

it resulted in a new regionalism that changed the course of Chinese history. Since then, the main constraint on the Chinese central government's power has been the power and resources of local governments.

What were the long-term effects of the *likin* system? If acting only as taxation, it can have negative long-term effects. Heavy transit taxes, such as the first type of *likin*, can hinder inter-regional trade, encourage autarky, and impose large burdens on producers and traders. Moreover, despite strengthening local fiscal capacity, the *likin* system may entail temptations regarding the fighting for and abuse of power, which may result in distorted resource allocation, as testified by the warlord competition for territorial control in the early twentieth century (Huang et al. 2021).

Another perspective on *likin* is that through establishing the local taxation system, it could also contribute to the development of local state capacity. Facing the brutalities of the war, physical safety and the protection of property protection jumped in priority 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 resistance against the Taiping rebels (Zheng 2009). Since the Late Taiping areas, which largely overlaps with the Lower Yangtze region, experienced greater violence while also having a greater level of 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 have been lower. Accordingly, local officials would have a vested interest in *likin* collection. Taken together, we can reason that higher *likin* revenues in the Taiping-controlled areas would have persisted.

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

evidence.[9]

There are reasons to believe the implementation of the *likin* system could have facilitated long-term development. *First*, *likin* financing made it possible for the gentry to resist the rebels, which reduced violence and destruction and thus may have contributed to long-term development. Even in Taiping-held areas during the rebellion, the Taiping Army only had control over some areas, and a large share of other areas were controlled by local gentry elites (Fairbank, 1992). The ability to raise *likin* allowed the gentry to maintain some control over local areas, to reduce casualties and property damage, and thus should have reduced adverse effects from the rebellion, in this way facilitating long-term development. *Second*, *likin* 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 had stronger incentives to cultivate these sectors. Since government support has always been indispensable in China for businesses to thrive, due to the overwhelming strength of the state, both historically and now (Acemoglu and Robinson 2019, Chapter 7; Cull et al. 2015; Huang, 2023), local officials would have offered support to foster the modern sectors, much as what local officials did in recent decades in modern China (Cull et al. 2017). Capitalists would also have had stronger voice in local politics, and this would have facilitated institutions such as public schools to complement their technologies (Galor et al. 2009), or charity organizations to support the urban poor that are an indispensable source of cheap labor in early industrialization. This would have facilitated industrialization, raised incomes, and supported technological change, which would have further raised the returns to human capital and increased schooling, thus facilitating modernization (Galor and Weil 2000). *Finally*, *likin* financing increased local leaders' economic and political power, which forged some executive constraints on the power of the central government.[10] Note that these three potentially beneficial effects of *likin* are conditional and more likely to occur in regions that have a stronger gentry and better initial conditions for developing modern sectors. We thus have:

The conditional likin-as-state-capacity hypothesis. The level of *likin* was persistently higher in the Taiping-controlled areas than elsewhere, especially in regions where the gentry were stronger. In regions with stronger strength of the gentry and with more favorable initial conditions, the stronger local fiscal capacity due to the *likin* system facilitated better long-term regional

[9] Cross-country evidence is provided by Gennaioli and Rainer (2007), Dincecco and Prado (2012), Dincecco and Katz (2016); for within-country evidence, see Michalopoulos and Papaioannou (2013).

[10] There is suggestive evidence that regional 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.

development.

II.3 The social change hypothesis

The rebellion also facilitated local charities in some areas, which could have had long-term consequences. Local elites began to be involved in local affairs from Late Ming dynasty (i.e., 16th century), as commercialization and merchant wealth led (and enabled) local commercial elites to raise their status through philanthropy, especially in the Lower Yangtze region (Rankin 1990). Local elite involvement continued throughout the Qing Dynasty, partly because the small Qing bureaucracy was unable to provide the necessary local services to accommodate the rapid increases in population and territories (Skinner 1977). This vacuum provided space for local elites to emerge and to manage local affairs. While Qing officials focused on taxation and criminal justice, local elites were heavily involved in education, water control, welfare services, famine relief, roads, ferries, bridges, and temples and shrines (Rankin 1990), most of which would be the government's responsibilities in modern times.[11] Moreover, increasing social disorder and conflict in the Qing Dynasty also induced local elites to develop local militias to maintain order and protect their properties (Kuhn, 1970).

During the rebellion, since the official Qing Army proved to be completely incapable of countering the rebellion, local elites stepped in, especially in the commercial regions where local militias were widespread (Kuhn, 1970; Rankin 1990). Moreover, once *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), 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,[12] and this collaboration was a driving force behind the final Qing triumph over the rebels (Zheng, 2009).

After the war, the local elites likely had stronger bonds with the poor, who had joined the fight and shared the attendant risks. The shared experience of the war may have facilitated a new social contract between the poor and the elite marked by greater trust and thus cause beneficial social change, much like what happened after the Second World War in the United Kingdom, where

[11] 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 early 20th century (Koyama and Xue, 2015).

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

support for social insurance programs became permanently stronger (Heldring, Robinson, and Whitfill 2022). Moreover, in the areas where local elites played decisive roles in achieving Qing victories over the rebels, they also gained unprecedented respect and power (Zheng 2009). Local elites thus used their strong bargaining power in the post-war reconstruction era, obtaining important local jobs and thus facilitating a new social contract.

A manifestation of this new social contract was the flourishing 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, appeared "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 and offered services such as disaster relief and medical aid, and in some locations, they sponsored local peacekeeping militias. The flourishing of such charities was more prominent in the Taiping areas featuring strong elites, whose importance increased while acting as *likin* collectors. For instance, Chen Zhengyue, for example, who led the fight against Taiping rebels in Yin County, undertook a wide range of activities, including "building up sacrificial halls, repairing sea dams, dredging rivers, setting up examination halls, and establishing orphanages"; he also managed disaster relief for 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, creating new local organizations and charities, thus shaping the emergence of a new public sphere (Rankin 1986, 1990; Schoppa 1982). They also played instrumental roles in the provisions of public goods, as demonstrated by the example of Chen Zhengyue.

By reaching a wider range of groups than that of traditional clan-based organizations, these new local charities facilitated trust across classes and socioeconomic status, 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. Indeed, 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 facilitates the expansion of markets and labor mobility. Indeed, generalized trust and other measures of social capital in the form of 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" to benefit 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. Prefectures with more charities would have better long-term development.

A recent literature emphasizes the complementarity between state capacity and the functioning of society. *First*, Besley and Persson (2009) propose that there is complementarity between state capacity and the institutional quality that governs society, according to which investments in fiscal and institutional capacities are complements. Here, institutional capacity includes both formal institutions such as the rule of law that support the market, and informal institutions such as civil society that facilitate trust. With the right circumstances, each capacity makes the other capacity more productive and induces investment in the other one. Besley and Persson (2009) note that the state capacity and institutional quality often improve in the same process, and this is demonstrated in the Taiping Rebellion as well. Fiscal decentralization in the form of the *likin* reform strengthened local state capacity. Since the implementation of *likin* reform and collection of *likin* were largely in the hand of local elites (Kuhn 1970, p. 161), and these elites were heavily involved in social change in the post-rebellion years, both local state and social capacity increased as a result. *Second*, Acemoglu and Robinson (2019) emphasize that the key to the long-term prosperity of a country is to have a "shackled Leviathan" or to let "the Red Queen effect" work by allowing *parallel* developments of state capacity and social power (i.e., the power and resources of the society to constrain the state), and not making either too powerful relative to the other. Here, social power includes many aspects: the rule of law to constrain both economic agents and the state; the wealth of the people; the capacity of the local region to collect taxes for local uses; and the ability of the society to mobilize for collective action when the state imposes its arbitrary will against the society. Since state power in China has dwarfed social power for millennia (Koyama and Xue, 2015; Acemoglu and Robinson 2019; Zhao, 2015; Huang, 2023), we can reasonably suppose that a marginal increase in social capacity would raise the marginal return on state capacity. Thus, under both versions, we expect a strong complementarity between state capacity and social capacity. We thus propose:

The state-society complementarity hypothesis. In the Taiping-controlled areas with stronger social capacity, fiscal capacity should be greater, and the positive effects on long-term development should be larger.

II.4 The rebellion and long-term social cohesion and political engagement

Social capital is important for the functioning of government and society (Putnam 2000; Tabellini 2008; Nannicini et al. 2013; Acemoglu and Robinson 2020). 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 have a greater propensity 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 is often shaped by significant institutional changes, and induced values and beliefs can persist even when the original institutions have long since disappeared (Nunn and Wantchekon 2011; Guiso, Sapienza, and Zingales 2016; Xue 2021).

It stands to reason that the social changes that occurred during the Taiping Rebellion could have had 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 mobilizations benefited their *personal networks* and *local communities* (Liang 2001). The process of gentry-led postwar recovery likely encouraged stronger values of cooperation and reciprocity, as well as a belief in self-efficacy, among local communities. Such values can persist across generations (Bisin and Verdier 2001; Doepke and Zilibotti 2008), despite the dissipation of the original motive forces. By way of example, Italian cities with the experience of self-government in the Middle Ages have stronger self-efficacy beliefs today – that is, confidence in one's ability to complete tasks and reach goals (Guiso, Sapienza, and Zingales 2016). *We thus expect Taiping areas to exhibit stronger social cohesion – especially within people's personal networks – as well as more civic engagement today.*

The experience of the Taiping Rebellion may have contributed to social capital and norms that helped to alleviate the fatal effect of political radicalism in modern China. The radical top-down grain procurement policies during the Great Famine years (1959-1961) 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 and render assistance, thus mitigating the adverse effects of radical central planning (Cao, Xu, and Zhang 2022; Hu, Yao, and You 2023; Chen 2010).[13] We thus expect that

[13] 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 the 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, which they had social ties with, 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.

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 political engagement hypothesis. The Taiping areas exhibit greater social cohesion, especially among people in their social networks, and more civic engagement today. The Taiping areas, especially the Late Taiping areas, where social capital was more developed due to the war experience, had fewer famine deaths during the Great Famine.

Figure 1 summarizes the hypotheses that we have derived, and we examine them in the following sections.

III. Data and Measurements

Our main data set encompasses 266 out of the 317 prefectures that made up the Qing Empire in 1820.[14] Among them, 211 prefectures had never been under the jurisdiction of the Taiping Rebellion, while 55 prefectures had been. Among the Taiping jurisdiction group, 37 prefectures had ambiguous land property rights policies associated with the Early Taiping areas and 18 prefectures had the stronger land property rights policies of the Late Taiping areas.

Measurement of key outcomes. Our first measure of key outcomes, especially for earlier years, is population density. In the regressions that follow, we use the log of prefectural level total population as the dependent variable and control for the prefecture fixed effects; in essence we use population density as the dependent variable. We are interested in how the rebellion affected the subsequent evolution of population.[15] We rely on two datasets. One is from Cao (2001), covering 266 of all 317 prefectures in China (Jia 2014; Chen and Kung 2016). It has population data at approximately three-decade intervals between 1820 and 1953. The other source is the national censuses of 1953, 1982, and 2000. Using the historical GIS maps of China, we merge the contemporary census dataset with the historical population datasets, after considering administrative boundary changes.[16] In the end, we rely on seven snapshots across two centuries (i.e., the years 1820, 1851, 1880, 1910, 1953, 1982, and 2000).

[14] Since shared state antiquity strongly affects long-term development (Bockstette et al. 2002), we follow the literature and exclude the prefectures with significantly lower shared state antiquity and without adequate data, which include those in the minority areas of China that were underdeveloped and less populated before 1953 (i.e., Xinjiang, Tibet, Qinghai, and Inner Mongolia); we similarly exclude the three Northeast provinces (Fengtian, Jilin, and Heilongjiang).

[15] 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.

[16] Using the administrative boundary in 1820 as the benchmark for the prefectures, we calculated the population in the same prefecture for different periods from 1953 to 2000 using the area as the weight, assuming even population distribution within a prefecture.

Long-term development is captured by modern outcomes. Income is captured by GDP per capita in 2010;[17] fiscal capacity is captured by fiscal revenue per capita in 2010; industrialization is captured by the share of non-agricultural employment in 2000; and human capital by average years of schooling and the mortality rate.

Measuring experience of the Taiping Rebellion. Based on Guo (1989) and Hua (1991), we construct a Taiping dummy that captures all the prefectures in the Taiping jurisdiction ("Taiping").[18] We use the Qing administrative boundaries in 1820 to define Early Taiping prefectures as those prefectures under Taiping jurisdiction in the provinces of Anhui, Jiangxi, and Hubei; these prefectures had ambiguous land property rights as discussed earlier. Late Taiping prefectures are defined as the Taiping prefectures in the provinces of Jiangsu and Zhejiang; these prefectures had more clearly defined land property rights.[19]

Idle land. Idle land is measured by the share of idle land in total arable land in 1915 from the Ministry of Commerce and Agriculture (1915), which provides county-level data for the Taiping provinces. Ideally we want to have the amount of idle land both before and after the rebellion to apply the difference-in-differences approach. However, because the national agricultural survey in China started at the beginning of 1910s, only cross-sectional regressions are feasible.

Likin. Provincial-level annual *likin* revenues from 1861 to 1925 are available from two sources: those for 1861 to 1908 are from Luo (1936); those for 1920-1922 and 1925 are from the Second Historical Archives of China (1996). To consider size differences between prefectures, we normalize *likin* by the area of the prefecture to arrive at *likin* per 1,000 square km.[20]

Charity. The data on local charities are from Liang (2001), the most comprehensive compilation of charities in the Ming, Qing, and the Republican eras. The primary sources behind the data are local gazetteers spanning the period from the 1400s to 1940s, with information on the

[17] Because the data come from various sources, the modern variables center around years 2000 to 2010, but are not of the same year. See Table B in the appendix for data sources.

[18] In defining Taiping prefectures, our main source of data is the map of the TPHK (i.e., Hua 1991). To implement, we coded Taiping areas at the county level using the Qing 1893 administrative boundaries, then we converted them to Qing 1820 administrative boundaries (between 1820 and 1893). We thus use the administrative boundaries of prefectures and provinces in year 1820.

[19] We have tried a robustness check in which we use being occupied largely before or after 1860 as the criterion for the classification of the Early or Late Taiping areas. The year 1860 was the year after which the vast majority of Jiangsu and Zhejiang provinces were occupied by the Taiping Army. The alternative definition of Late Taiping prefectures largely coincides with our original definition, except for the Jiangning and Zhenjiang prefectures (under the Qing definition), which were occupied before 1860. When using the alternative definition of Late Taiping areas based on whether a prefecture was being occupied largely before or after 1860, we define a prefecture as a Late Taiping area if it was occupied for a longer period after 1860 than before 1860. For example, if prefecture *A* is occupied by the Taiping Army for 11 months before 1860, and for 20 months after 1860, then we define *A* as a Late Taiping area. In this case, the Jiangning and Zhenjiang prefectures (of Jiangsu) are included in the Early Taiping areas. The qualitative results (available upon request) remain the same.

[20] Normalizing by population tends to yield similar conclusions, but the population tends to fluctuate more than the area does.

year of establishment and location. Following Hao and Xue (2017) and Xue (2021), we construct a measurement of social capital using the accumulation (stock) of charities in the prefecture by the end of each period. This measurement is constructed using the flow data for the establishment of charities, and the underlying assumption is that the charities were not shut down after they were established before the founding of the People's Republic of China.[21] While this assumption might be strong, anecdotal evidence suggests that charity organizations persisted for a long time and that local gentries had strong incentives to participate in such charities (Zheng 2009). Moreover, civic values associated with charities likely lived on, which also makes the impact of charities long-lasting. Our earlier hypotheses also cover the impact of the rebellion on modern beliefs and civic engagement, and we will delay the discussion of their measurement to details in the empirical results section.

Control variables. We include basic controls for prefecture characteristics that might affect long-term development, such as geography, natural resources, and political importance. Proxies of geography 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 the prefecture. These geographical indicators are important to control for because (i) we need to hold constant geographical conditions under the Taiping areas, and (ii) we later rely on a geographical indicator (longitude) as the instrumental variable for the Taiping areas based on the spatial military strategy of the Taiping Army. We control for the number of neighboring provinces because prefectures near multiple provincial borders were less tightly controlled by the provincial governments, and thus they were more prone to experience rebellions, due to free-riding problems and monitoring difficulties. All geographical variables are from China Historical GIS Data (Bol and Ge 2007). Since the treaty ports system has had strong impacts on population growth and income (Jia 2014), we control for the duration (in years) of being treaty ports before 1949 and the duration of concession or leased territories (Fei 1991).

We further control for basic prefectural characteristics. We measure the level of land taxes by the average farmland tax per mu in 1820 (Liang 1980), the level of human capital by the number of palace graduates per million people from 1793 to 1820 (Jiang 2007),[22] and the pattern of agricultural production by the dummy variables of producing silk and tea before the Taiping Rebellion (Wu 1990). To measure political importance, we create four dummy variables based on the Qing classification in 1820 that assigns prefectures to some of four designations: Chong (important for transportation), Fan (important for business), Pi (difficult to gather taxes), and Nan

[21] The data do not report any applicable closure dates for charities. However, before the Communist victory in 1949, it is plausible that charity closures were rare.

[22] The palace graduates (*jinshi*) are successful candidates in the highest imperial civil service examinations. Huang (2023, p. 106-107) suggests that Keju was the key factor in building up local literacy in Chinese history.

(high in crime). Since other wars could also affect the outcomes, we control for the frequency of wars since 1776 (Chinese Military History Editorial Committee 2003; Li 2007).[23]

Descriptive statistics. Table 1 compares the differences in population growth from the pre-rebellion year of 1820 for the control group (i.e., the non-Taiping prefectures) and for the treatment groups. Before the rebellion (i.e., year 1851), the difference in the population growth rate between the control and the Taiping groups is insignificant. After the rebellion, by contrast, the disadvantage in population growth from the pre-rebellion level of the Taiping areas (relative to the non-Taiping areas) remains large, and may even have expanded over time, from 47 log points in 1880 to 57 log points in 2000 (see also Figure 2). The *initial* drop in population in the Late Taiping areas, relative to the control areas, were more pronounced than in the Early Taiping areas (see columns (5) and (7)): population growth in Early (Late) Taiping regions was lower than the control group by 41 (60) log points in 1880.

IV. The Impact of the Taiping Rebellion on Population and Local Taxation

We now examine the impact of Taiping Rebellion on population growth. We use the panel data for the 266 prefectures and the seven snapshots of population from 1820 to 2000. The pre-treatment years are 1820 (the default year) and 1851.[24] The baseline regression is as follow:

$$\ln pop_{it} = X_{i,t}^{'}\beta + \sum_t \beta_t D_t Z_i + \sum_t \alpha_t D_t Taiping_i + \rho_t + \eta_i + e_{i,t} \qquad (1)$$

Here $X_{i,t}$ is a vector of time-varying controls, including the duration of treaty ports, concessions, leased territories, and the frequency of wars. Z_i is a vector of time-invariant controls including geographical and historical variables (i.e., 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 unit of land; the total number of palace graduates per million people from 1793 to 1820; the silk and tea prefecture dummies; the four designations of the Qing government in 1820), which are allowed to have period-specific effects so that the local endowment could have time-varying effects. $Taiping_i$, the Taiping area dummy, is allowed to have year-specific effects. The coefficient of interest is α_t, which measures the impact of Taiping Rebellion on population growth. ρ_t and η_i are the year and

[23] 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 Qing Empire during the period. More precisely, it includes peasants' revolts against Qing, wars and battles between Qing and foreign power, conflicts between peasants and foreign power, and battles in 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 Communist Revolution (1945-1949).

[24] We have explored including the longest time series (i.e., further including the population data in 1776) and allowing for more pre-treatment years, and we found that the conclusion that the rebellion caused a large population drop is robust.

the prefecture fixed effects. The prefecture fixed effects capture all time-invariant factors such as geography. The year fixed effects capture all macro shocks. $e_{i,t}$ is the error term.

Since the Taiping regions may differ systematically from the non-rebellion regions, following Xue (2021), who also examines Qing-era panel data outcomes, we rely on a matching estimator so that the treatment and control groups are similar in observable characteristics (Heckman, Ichimura, and Todd, 1997). We thus construct a matched sample based on the propensity score matching method. In particular, the conditioning covariates are: the distance to the Grand Canal, to the Yangtze River, and to the east coast; taxes per unit of land in 1820; the four post designations of 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; and the number of palace scholars (*jinshi*) from 1793 to 1820. We first estimate a probit model on the Taiping dummy using the above covariates. We then obtain the estimated probability of a prefecture receiving the Taiping treatment, i.e., the propensity score. Relying on the propensity score, we match each treated unit to an untreated unit that has the closest propensity score with replacement (nearest matching). The untreated units that do not share common support with the treated units are not used in the matching process. They are balanced in terms of the propensity score and in terms of covariates (see Table 2). Propensity score matching methods do not deal with selection on the unobservable, but they are transparent, and do not suffer from the issue of sensitivity with respect to diverse estimates when using many equally plausible instrumental variables (Young 2017).[25]

IV.1 The OLS results

Column (1) in Table 3 presents the regression results using the full sample. To examine selection bias, we allow the period immediately before the Taiping Rebellion to have a distinct effect for the Taiping areas –as a test of selection bias. The estimate of the Taiping coefficient before the rebellion (i.e., 1851) is small and statistically insignificant, suggesting a lack of selection bias for the Taiping areas after proper controls are employed. After the war, the Taiping coefficients increase dramatically in magnitude (in absolute value). 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 -0.46, which implies that the population growth of Taiping areas in 1880 relative to the pre-rebellion years is 37 percent lower than that of the control group.[26] This large drop in post-rebellion population growth is indicative of the devastating impact of the rebellion. The initial drop in

[25] 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 historical event and that explain the final outcomes. After all, history consists of an almost infinite number of historical events, and one cannot be sure what events explain the final outcomes. Moreover, could the subsequent historical events be caused by the treatment events? These are fundamental questions that exceed the scope of this paper. However, this caveat should be kept in mind.

[26] That is, $e^{-0.46} - 1 = -37\%$.

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.[27] 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 percent lower than that of the control group, even one and a half centuries later. The Taiping Rebellion thus had a long-lasting impact on population growth. The post-1953 population disadvantage of the Taiping regions remains substantial, but during this period, the changes may partly reflect the results of the family planning policies installed throughout China in the late 1970s. The long-term impact on population of the rebellion is also demonstrated by the relative decline of the population in the Taiping areas as a share of total population (of the sample prefectures), which went from 34.3 percent in 1776 to 22.7 percent in 2000.

We conduct several robustness checks. First, in columns (2) and (3), we allow the Taiping effects to differ by the Taiping "dose" by replacing the Taiping dummy with the Taiping dummy's interaction with the log of the number of battles during the rebellion and with the log of the duration of the Taiping occupation (in months). The qualitative results remain similar: the Taiping effects remain stable, and no recovery in population takes place relative to the comparison group. *Second*, to ensure that our results are not driven by the prefectures that fought the heaviest rebellion battles, we exclude six such prefectures (Wuchang, Songjiang, Anqing, Jiangning, Suzhou, and Hangzhou) from the sample (Platt 2013). The results in column (4) are similar. *Third*, this rebellion had affected subsequent imperial exam quotas (Li 2014), which may influence the subsequent trajectory of human capital. 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 the prefecture since the end of the last period.[28] Its coefficient is insignificant, and the Taiping coefficients remain similar.

Another concern is that these Taiping effects reflect Taiping-induced migration. We believe that Taiping-induced migration only played a marginal role in determining population changes. In his authoritative study on historical migration in China, Ge (1997, p. 469-470) states, "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 are even less 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."

[27] See Jedwab, Johnson, and Koyama (2022) for a survey of the impacts of the Black Death.
[28] The data set 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).

IV.2 Spatial autocorrelation

Economic historians recognize the importance of Tobler's law of geography – namely, that adjacent locations are more likely to share common characteristics 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 allowing for spatial interactions, we estimate the spatial autoregressive model (SAR) to allow for cross-regional interactions between both dependent variables and the explanatory variables and error term.[29] That is,

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

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

Here Y_t is a vector of the outcomes for all cross-sectional units in year t. X_t is a $n \times k$ matrix of explanatory variables. W is the spatial weight matrix, which we use the inverse-distance matrix – the weights are inversely related to the distances between the capital cities of two prefectures. We control for prefecture fixed effects (i.e., μ). In this model, we allow that a prefecture's outcome is affected by both other prefectures' outcomes and other prefectures' explanatory variables. We also allow for the error term to have spatial autocorrelation. We conduct Pesaran's test for cross-sectional independence of the error term. The results using the full sample and the same list of variables augmented by the spatial interactions above are in column (6) of Table 3. The Pesaran's test results indicate that there is significant cross-sectional dependence of the error term across regions.

Allowing spatial interactions, the pattern of the Taiping effects over time remains similar to what we find for column (1) for the full sample: a persistence of significant and large long-term population losses in the Taiping areas relative to the control areas, with the amount peaking in 1953.

IV.3 The matching estimates

The results based on the matched sample are in column (7). Here the sample is substantially reduced from 266 to 104 prefectures. However, the qualitative results remain quite similar to those of the full sample in column (1). Since it is important to hold the treatment and control samples similar, especially when we deal with many other outcomes, and when we consider the outcomes in the long run, for the rest of the paper, we mainly rely on the matched sample.

[29] This is implemented in Stata relying on Belotti et al. (2017).

IV.4 Instrumental variable estimates

The estimate of the rebellion's effect could suffer from an omitted variable bias if the Taiping areas, conditional on our controls, still differ systematically from the other areas. To account for this, we consider an instrumental variable (IV) approach here: historical documents, to be explained below, show that the rebellion's top leaders adopted a military strategy that resulted in a spatial pattern of occupation that was related to longitude. We thus use the longitude of the prefectural seat as the IV for the Taiping dummy while holding key geographical features that may be related to the longitude constant.

The longitude satisfies the relevance condition as the instrument of the Taiping dummy. A key determinant of an area being under Taiping control, our treatment variable, was that at the beginning, the rebellion attracted a capable river-bandit leader Luo Dagang (罗大纲), who had led more than a thousand river bandits to join the rebellion (Spence 1996). After that, the use of the Taiping Navy was 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 (currently Nanjing), located on the eastward-flowing Yangtze River, and then use Nanjing as a base to expand. Following this plan and relying on its navy,[30] 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 3). Few prefectures in the west of China or in upstream areas of the Yangtze River were under the control of the Taiping Army. This explains why the areas located in eastern China were more likely to be under Taiping rule, which implies that the longitude likely satisfies the relevance condition as an IV for the Taiping dummy. This is confirmed in Table 1: the Taiping prefectures have significantly higher average longitude.

The longitude also likely satisfies the exclusion restriction. A concern is that the longitude may affect population through other non-Taiping-related channels. For example, the population growth in the east could be higher due to favorable geographical characteristics, such as arable land availability, irrigation potential, or lower transportation costs. To allow for this, 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. After having these geographical controls, the longitude should be excludable in explaining population growth. Finally, the longitude is not correlated with other pre-rebellion

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

explanatory variables: In panel C of Table D in the Appendix, we regress the key explanatory variables on longitude while controlling for the remaining explanatory variables, and the results indicate little correlation between the IV and the unobservable. The literature suggests that if the IV is strongly correlated with the observables, it is likely correlated with the unobservable (Altonji et al. 2005).

Since weak IVs harm the integrity of IV estimates and the existing testing framework focuses on a single endogenous variable, we conduct our two-stage least-square (2SLS) estimation using all pre-Taiping periods and a single post-Taiping period at a time, so that in total we conduct five 2SLS estimations (i.e., for the years 1880, 1910, 1953, 1982, and 2000), one endogenous variable at a time. When pooling all periods, the results are similar (see column 8 of Table 3) except that we do not have guidance on how to interpret the test statistics. The results in Table D of the Appendix indicate a strong IV: All the F statistics for the five separate regressions are above 20 (Staiger and Stock 1997). Moreover, the magnitudes become more pronounced than the FE estimates, but the qualitative results and temporal trends of the Taiping impacts on population remain similar to our earlier results. The results again confirm a permanent negative impact of the rebellion on population in the Taiping region.[31]

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

We now examine whether relative to the Early Taiping areas, the Late Taiping areas that featured clearer land ownership had less idle land and faster post-war population recovery. The data on idle land include 332 counties on their shares of idle land in the Taiping provinces in 1915. We have data on 151 Early Taiping counties, 95 Late Taiping counties, and 86 control counties (see Panel A, Table 4). Since we have more limited (and county-level) data, we do not use the matched sample here.

In panel B of Table 4, we present the cross-sectional regression results of the determinants of the percentage of idle land in 1915. The control variables include the distance to Yangtze River, distance to the coastline and the dummy variables of being a prefecture capital seat, of being

[31] 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.

considered a key county by Qing government in 1820, and of being a trade center in 1915.[32] We also control for 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 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 the non-Taiping counties. The lack of significant difference between the non-Taiping and the Late Taiping counties in idle land is suggestive: the reallocation of property rights between former landowners and farmer 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, and indeed they had less 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), and (ii) the *likin* intensity immediately after the Taiping Army's fall; both additional variables do not explain the idle land ratio.

Do the Taiping land policies affect the long-term population growth? Using the same samples and controls as in equation (1), we estimate the panel data equation:

$$\ln(pop_{i,t}) = \sum_t \alpha_{1t} D_t * Early\ TP_i + \sum_t \alpha_{2t} D_t * Late\ TP_i + X_{i,t}^{'}\beta + \sum_t \beta_t D_t Z_i + \rho_t + \eta_i + e_{i,t} \quad (4)$$

In columns (1) of Table 5, we report the full sample results. In column (2), we report the SAR model with the full sample. In column (3), we report the results using the matched sample (i.e., based on the propensity score for the Taiping dummy to select controls). Since the results based on the matched sample are likely the most credible, we focus on column (3).

Based on column (3), compared to the control group, the Early Taiping areas experienced an immediate post-war drop in population of 34 percent (i.e., $1 - e^{-0.42}$), and a *further drop* of 12 log points until the Communist takeover in the mid-twentieth century. This is consistent with the finding that poor land property rights in the Early Taiping areas led to more idle land and thus slower population recovery. They recovered slightly in the second half of the last century.[33] In contrast, the Late Taiping areas experienced faster population recovery than the Early Taiping areas. While the Late Taiping areas experienced a drop in population of 8 percent in 1880, it is not statistically significant. Moreover, for all the post-Taiping years, Late Taiping's relative population change is similar to that of the control group. This quick recovery in population could be explained by two forces: first, convergence toward the mean when factors such as labor flowed to the region with a higher land/labor ratio; second, good land property rights in the Late Taiping areas led to faster re-utilization of idle land, and perhaps more migration, both facilitating population growth.

[32] We do not control for the distance to the Grand Canal because it did not pass our sample counties here.
[33] After the Communist takeover, the population in the Early Taiping areas recovered 10 log points relative to the control group, perhaps because there was more idle land to begin with, which allowed more land reclamation.

The results here are consistent with the land property rights hypothesis.

The two robustness checks based on the full sample are consistent with the baseline results. The pattern is the same for the Early Taiping regions. For Late Taiping areas, the full sample results in column (1) suggest a larger drop in the population level than in Early Taiping areas, but we still see faster population recovery in the Late Taiping regions since the late Taiping coefficient becomes smaller in absolute values. The SAR model in column (2) reaches conclusions similar to the results based on the matched sample.

V.2 The effect of *likin* and underlying alternative hypotheses

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 and consequences, we now examine how the rebellion shaped *likin* collection and how *likin* intensity is associated with population evolution. To proxy the level of *likin* for 1880, 1910, and 1953 in our population dataset, we use their annual average of the periods 1869 to 1879, 1880 to 1908, and 1920 to 1925.[34] Because *likin* was abolished in 1931, for the years before 1880 and after 1953 (i.e., 1820 to 1851, and 1982 to 2000), we set the *likin* amount at zero. Since *likin* was irrelevant for China after 1931, but the population level in 1953 still reflect the effects of *likin* up to the year 1931, we exclude the periods after 1953. We thus use the panel of 104 prefectures of the matched sample and the periods of 1851, 1880, 1910, and 1953.

To examine whether the rebellion led to a higher *likin* intensity (i.e., measured as the log of *likin* revenue per thousand square kilometers) for the Taiping areas, we run the following difference-in-difference regression to see how the level of *likin* changed after the rebellion:

$$Likin_{it} = \sum_t \gamma_t D_t Taiping_i + d_t + \eta_i + e_{i,t} \quad (5)$$

Here D_t is the time dummy variable; $Taiping_i$ could be either the Taiping dummy or the Early Taiping and Late Taiping dummies. d_t and η_i are the year and the prefecture fixed effects. The standard errors are clustered at the prefecture level. Table 6 reports the results.

Three findings emerge. First, from column (1), the *likin* intensity was much higher for the Taiping areas. In the first post-rebellion year of 1880, the Taiping areas collected four times (i.e., $e^{1.414}$) as much *likin* as other areas. In 1931, seven decades after the initiation of *likin*, its intensity in the Taiping areas was still close to four times that of other areas. This suggests that the Taiping experience led to a permanent strengthening of local fiscal capacity. Second, from column (2), *likin* intensity is much higher in the Late Taiping areas than in the Early Taiping areas. Comparing Early

[34] The average likin revenues from 1920-1925 are an imperfect proxy of likin burdens for 1910 to 1953, but only this strategy is feasible. Likin was abolished in 1931, so the effect of likin for the period up to 1953 should be viewed as the effect of likin in the early part but not the whole period of the years up to 1953. If likin was fully transformed into other types of taxes after 1931, the effect can be interpreted as for the whole period.

Taiping areas to the control, the *likin* intensity ratio was 3.0 and 2.9 in 1880 and 1931, respectively. By contrast, this ratio between Early and Late Taiping areas was 9.4 and 7.0 in 1880 and 1931, respectively. These findings support the conditional *likin*-as-state-capacity hypothesis of a positive link between the rebellion and local fiscal capacity.

VI. The Impact of the Taiping Rebellion on Social Capital

As discussed earlier, the number of charity organizations, which is 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.

Baseline results

Table 7 examines the impact of the rebellion on the logarithms of the number of charities in a prefecture. All the control variables are the same as in the baseline population equations. Again, we use the matched sample.

The effects of the rebellion on charity organizations depend on the context. In column (1), when we treat the Taiping areas as being homogeneous, the rebellion is not significantly associated with charity organizations in post-rebellion years. In column (2), when we distinguish between Early and Late Taiping regions, however, we find divergent social development. In all the post-rebellion years, the Early Taiping regions did not have a different trajectory for charity organizations, when compared to comparable non-rebellion regions. However, the Late Taiping regions had significantly more charity organizations after the rebellion and experienced a rising trend. Before the rebellion in 1851, the Late Taiping regions had a similar number of charity organizations as the comparable control-group prefectures. Immediately after the rebellion (i.e., 1880), the number of charities in the Late Taiping prefectures was higher than comparable control prefectures by 47 percent (i.e., 39 log points). This advantage in charity organizations in Late Taiping prefectures grew to around 80 percent in the first half of the 20th century. We have also tried an alternative specification in which the number of charity organizations has a constant growth rate by decade for both the Early and Late Taiping regions. Again, both the level and growth rate effects for the number of charities are significant, and substantial only in Late Taiping regions. The Taiping Rebellion thus substantially facilitated growth in charity organizations in the Late Taiping regions. The findings here are consistent with the social change hypothesis that the Late Taiping regions would have faster charity development.

VII. The Long-Term Consequence of the Taiping Rebellion

We now examine the rebellion's impact on long-term development. Measures of the quality of modern development come from two sources. The first is China Regional Economic Statistics Yearbook 2010, from which we obtain GDP per capita, fiscal revenue per capita, and an indicator of the modern sector structure (i.e., the share of non-agriculture in GDP) in 2010. The second is the 2000 Census (China Data Center and Spatial Data Center 2017), from which we obtain two indicators of human capital (i.e., the average years of schooling and the mortality rate). Using ArcGIS, we merge the modern dataset (348 cities) with the Taiping historical variable dataset (266 prefectures in Qing classification).[35] In the end, 272 modern cities are merged into 192 (Qing) prefectures. As before, to ensure the treatment and the control samples are *ex ante* similar, we use the matched sample, which results in 72-80 prefectures, depending on the outcome variable.

VII.1 The impact of the Taiping Rebellion and local taxation

We explore the impacts of the Taiping experience and the subsequent changes stemming from the rebellion progressively, moving from simple to comprehensive Taiping-related indicators in our specifications. We start with the rebellion status and local fiscal capacity. We report the OLS results with the matched sample. With the same set of control variables as before,[36] we report two specifications: (i) only having the Taiping dummies; (ii) having Early Taiping, Late Taiping, and (log) *likin* intensity (in 1880).

If we characterize the Taiping simply by a dummy variable, as in Panel A of Table 8, on average the Taiping regions now behave similarly to the comparable control prefectures. An exception is that the Taiping regions have contemporary fiscal revenues that are 41 percent higher (i.e., 34 log points). We have also performed 2SLS estimations (unreported) using as before the longitude as the instrumental variable for the Taiping dummy, and we also find largely insignificant differences between the Taiping prefectures and the comparable control prefectures. We have further explored the robustness of the main results using the SAR model to allow for spatial spillover, and the results are robust (see Table E in the appendix).

Panel B distinguishes the Early Taiping and the Late Taiping areas and adds (log) *likin* intensity. Recall that the Late Taiping regions had better land property rights during and after the rebellion. Now, the Late Taiping regions have much better performance than the Early Taiping regions.

[35] There are 348 cities in the modern dataset, of which 272 are in the territory covered by the Taiping dataset (which consists of 266 prefectures). We first generate the center point of these cities and then use the point-shape file to merge with the historical dataset (polygon-shape files). The central point of a city falls into a prefecture polygon results in a match.

[36] 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.

Relative to comparable control prefectures, the Early Taiping regions are similar in fiscal capacity, the share of modern sector, education, and health, but lower in per capita GDP – namely, by 20 percent (or 23 log points). In stark contrast, the Late Taiping regions have GDP per capita that is 71 percent (54 log points) higher, and fiscal revenue per capita that is 165 percent (97 log points) higher. They do not differ from the control prefectures in the share of non-agriculture in GDP and the average level of schooling, but they do have a higher mortality rate. The strong advantage of the Late Taiping areas relative to the Early Taiping areas is consistent with the property rights hypothesis.[37] The higher mortality rate in the more developed Late Taiping areas could reflect the price paid by higher urbanization and industrialization in this region, similar to the case of the Black Death in Europe, after which there was increasing urbanization in some countries that also had a higher mortality rate (Jebwab, Johnson and Koyama 2019). Interestingly, and consistent with the *likin*-as-state-capacity hypothesis, a one standard deviation (i.e., 3) increase in post-rebellion *likin* intensity more than a century ago by one standard deviation is associated with a 6 percent higher level of schooling, and a 0.42 per thousand residents lower mortality rate or roughly half a one standard deviation decline in the mortality rate. Stronger state capacity a century ago is thus associated with better provision of public goods today. We have also explored the robustness of the main results using the SAR model to allow spatial spillover, and the results are robust (see Table E in the appendix).

VII.2 The impact of social capacity

Table 9 further considers how post-rebellion charity development affects modern outcomes. In Panel A, we include the logarithm of the average number of charities in the prefecture from 1880 to 1953.[38]

The number of charities is positively associated with most modern development outcomes. Increasing this variable by one SD (1.37) is associated with a 23 percent (or 21 log points) increase in income per capita and a 31 percent (or 27 log points) increase in fiscal capacity. Interestingly,

[37] The ways property rights during and immediately after the rebellion could have long term impact via two ways. 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 un-reported results, we link a measure of firms' perceived property rights protection in the World Bank Enterprise Survey for 120 cities in 2005 with the Early Taiping and the Late Taiping regimes (along with some basic controls as in Table 9), and we do not find any significant association. Combining what we found in Table 9, as well as the lack of link between the two Taiping dummy variables and the modern measure of property rights protection, we conclude that the Taiping-era property rights likely affected modern outcomes via the income effects rather than the persistence of property rights.

[38] We use the average to capture the full impact of the social changes associated with charity organizations for the post-rebellion years ending in the Communist triumph in China. We use the end year of 1953 for our calculation because it was the nearest year to the birth of the People's Republic of China.

once netting out the effects of social capacity, Late Taiping regions' advantages in GDP and in fiscal revenue per capita are significantly reduced – by around one-fifth. This finding suggests that a channel of the Late Taiping areas' advantage now is the rebellion's impact on social changes in these areas. The results based on the SAR model are similar (see Table F in the appendix). These results support the social change hypothesis.

VII.3 Testing the state-society complementarity hypothesis

To consider how local state capacity and local charity development interact in affecting long-term development, we interact the log of *likin* intensity and the log of the average number of charities in Panel B of Table 9. The key finding here is the complementarity of societal capacity and local state capacity. This interaction term is positive and significant for GDP per capita and the share of modern sector, and it is positive and close to significant for fiscal revenue per capita (a p-value of 0.102). This finding is consistent with the hypothesis of complementarity between state and social capacity.

To see how much a difference in social capacity matters, we evaluate the marginal effects of changing state capacity (i.e., log *likin*) by one standard deviation (i.e., 3) when evaluating at a low level of social capacity (i.e., the mean *minus* one standard deviation of the charity variable) and a high level (i.e., the mean *plus* one standard deviation of the charity variable), respectively. *First*, at the low level of social capacity, changing historical state capacity by one standard deviation (SD) is associated with a GDP per capita *decline* of 8 log points;[39] but at the high level of social capacity, the effect is a GDP per capita *increase* of 46 log points. *Second,* at the low level of society capacity, changing historical state capacity by one SD is associated with a fiscal revenue per capita *reduction* of 23 log points; at the high level of society capacity, the effect is a fiscal revenue per capita *increase* of 35 log points. *Third,* at the low level of social capacity, changing historical state capacity by one SD is associated with a 1.3 percentage point *decline* in the share of non-agricultural sector; at the high level of social capacity, the effect is an 8.6 percentage point *increase* in the share of the non-agricultural sector. As these numbers demonstrate, the complementarity between social capacity and state capacity is strong. In the long run and without sufficient social capacity, strengthening state capacity historically could adversely affect local development outcomes such as income, fiscal capacity, and the development of modern sectors. The results allowing for spatial autocorrelation are similar (see Table G in the appendix).

[39] We obtain the magnitude as follows. First, $\frac{\partial Y}{\partial Likin} = \beta_{Likin} + \beta_{Likin*Charity} Charity$, where Y refers to the specific outcome under consideration, and β refers to the coefficient in the regression. Second, we evaluate the expression above for the low and the high charity level, respectively. Third, we multiply the amount of change in *likin* (i.e., a standard deviation of 3) to obtain the magnitude.

VII.4 The rebellion and contemporary political attitudes and behavior

We have offered evidence on the important role played by social capital, as captured by charity organizations, and its complementarity with local state capacity in shaping long-term development. We now offer further evidence that the rebellion – sometimes via its effect on social capital – also affects modern-day trust towards in-group members and political engagement.

We employ the China General Social Survey (CGSS hereafter) in 2010 to capture group trust and political engagement. CGSS includes rich information on people's attitudes and behaviors.[40] We match contemporary prefectures in the CGSS with Qing prefectures for the status of the Taiping Rebellion. We conduct a PSM procedure as before to keep otherwise similar Taiping and non-Taiping prefectures. Our final sample includes 28 modern prefectures in 11 provinces in the CGSS data.[41] The sample (in terms of the number of prefectures) is much smaller here than the previous sample for long-term outcomes due to the limited regional coverage of the CGSS. For all regressions, we include the same set of baseline prefecture-level controls. We also control for individual level covariates, including gender, age, educational attainment, and urban residence status. We cluster the standard errors at the prefecture level.

Interpersonal trust. The first set of outcomes we examine is related to interpersonal trust. The CGSS asks whether a respondent trusts different types of social or political actors (i.e., strangers, family, relatives, friends, coworkers, and government cadres). The regressions are at the individual level, but the standard deviation is clustered at the prefecture level, since our key variables on Taiping and charity organizations are at that level. The results are in Table 10.

Based on Panel A, relative to people in the non-Taiping areas, those in the Taiping areas exhibit higher trust in their personal network (relatives, friends, and coworkers), but lower trust in government cadres. Note that the effect on trust in family is insignificant, likely because the trust in family in Chinese society is highly engrained due to the strong Confucian tradition: 98 percent of respondents trusted their family. We also do not find a significant impact on trust in strangers.

Based on Panel B, the higher trust in personal networks is largely only in the Late Taiping areas, while the lower trust in government cadres is mainly in the Early Taiping areas. The results are consistent with the following notion: The Late Taiping areas featured strong local cohesion (led by local gentries) during the fight against the Taiping rebels, which facilitated the trust in local networks then and afterwards; moreover, given weaker protection of property rights in the Early Taiping areas, stronger distrust of cadres is a reflection of deep-seated distrust in government in these areas. The results suggest that the rebellion experience facilitated cooperation and trust in

[40] The same dataset has also been used by Xue (2021) to study the long-run impact of state repression on trust.
[41] The CGSS covers 67 (Qing) prefectures in our historical sample of the Taiping Rebellion.

one's own networks (i.e., relatives, friends, and coworkers) where local gentries led the fight (i.e., the Late Taiping regions), but reduced trust in cadres in the government where the rebellion areas were associated with weaker protection of property rights by local governments (i.e., the Early Taiping regions).

To understand whether the Taiping Rebellion exerts effects through the channel of social capital, Panel C adds the intensity of charity organizations. 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.

Civic engagement. 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 2020; Huntington 1991; Shirley and Xu, forthcoming).

We employ four measures of civic engagement from the CGSS. The first three measures concern *confidence* in civic engagement. *First*, *civil assertiveness* is equal to one if the respondent disagrees with the assertion that people should obey the government. *Second*, we examine *political efficacy* by combining a respondent's answers to questions about their ability to participate in politics, including whether they feel (i) incapable of understanding the complexity of government work, (ii) unable to influence the government, (iii) their opinions unimportant to officials, and (iv) unconfident in discussing politics with others. Consistent with the Confucian tradition, in our sample, 70 percent of respondents believe that they should obey the government, and 54 percent believe they do not have an ability to participate in politics. *Third*, *attention to politics* is a variable equal one when a respondent reports that he/she follows political news or routinely talks about politics with other people. In the sample, only 21 percent of respondents report that they pay attention to politics. Since all three measures capture some aspects of political confidence, we construct a first principal component of these three measures and call it *political confidence*.

Columns (1) to (4) of Table 11 present the impacts of the Taiping Rebellion on these four measures. The empirical controls and standard deviation clustering are the same as before. Since the results on the three components of political confidence tend to be consistent, and the aggregate measure of political confidence is more informative, we focus our discussion on *political confidence.*

In Panel A, political confidence is significantly stronger in the Taiping areas than in the non-Taiping areas. This suggests that people in the Taiping areas may feel a stronger sense of empowerment. In Panel B, we distinguish between the early and Late Taiping areas. The Late Taiping areas have significantly stronger *political confidence* (about 50percent more pronounced)

than the Early Taiping areas.

In Panel C, social capital itself strongly increases *political confidence*. At the same time, the magnitudes of the coefficients on the Early and Late Taiping regions are reduced significantly. The effects of Taiping experience on *political confidence* thus partly reflect changes in social capital, which appear to have facilitated political empowerment.

In Panel D, we interact social capital and Communist Party membership density (PMD), which is taken from Yang (1996). The ruling party, especially when its control over society is strong, can take advantage of the prevalence of social organizations for its agenda and rule (Satyanath, Voigtlander, and Voth 2017). Indeed, Panel D shows significant interactions between social capital and the ruling party penetration. Although social capital and state penetration independently strengthen political confidence, their interaction term is negative, indicating a lesser ability of social capital to improve political confidence in the presence of a strong ruling party density. This result is consistent with that of Satyanath et al. (2017), who find that the ruling party can use social capital density for its own rule, thus weakening the positive role of social capital.

Another measure of civic engagement is at the local level, about local political engagement, as captured by *engagement in local affairs*. We 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 19% of respondents report that they have ever participated in local affairs. Using this measure, column (5) presents the impacts of the Taiping Rebellion on local political engagement. In Panel A, we do not observe significant differences between Taiping and non-Taiping areas. But when we distinguish the Late and the Early Taiping regions in Panel B, interesting patterns emerge. The Late Taiping regions feature significantly higher local participatory behavior. In Panels C and D, we find that social capital is not robustly associated with local political participation, and its effect does not hinge on the density of ruling party membership.

VII.5 The rebellion and the Great 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 regional differences in responses to another disaster, the Great Famine (1959-1961)? The changes induced by the Taiping Rebellion in occupied regions may have made some regions better equipped to respond to this disaster that occurred a century later.

The Great Famine was one of the deadliest famines in human history, with a toll death that has been estimated at 16 to 45 million (Coale 1981; Dikötter 2010; Li and Yang, 2005). Previous studies suggest that the 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 alleviate 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).[42] 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, we adopt "famine control" as measured by famine severity at the prefecture-level – that is, the ratio of the size of cohorts born during the famine period (1959–61) relative to the size of cohorts born during the pre-famine period (1954–57), as observed in the one percent sample of the 1990 population census:[43]

$$Famine\ Control_i = \frac{\text{Size of cohorts born in 1959–61, prefecture } i}{\text{Size of cohorts born in 1954–57, prefecture } i}. \qquad (6)$$

The *higher* the measure, the *less* severe the famine was in prefecture i. An x unit increase in $FamineControl_i$ can be interpreted as a $100x$ percent increase in the size of famine survivors (relative to those born during the pre-famine period). *Famine Control* is less vulnerable to misreporting because it is less influenced by the government's desire to understate famine severity.

[42] 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.

[43] This measure is the same as that used by Fang et al. (2023). 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 G, we show that our results are robust to alternative measures.

Table 12 presents how the experience of the Taiping Rebellion affected famine severity in a prefecture. As before, we report the OLS results that use the matched sample and include the same set of control variables. From Column (1), the famine was significantly less severe in the Taiping areas. Specifically, the Taiping areas had a 6.5 percentage-points 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 40 percent stronger in the Late Taiping areas (i.e., 8.4 vs. 6 percentage points).

To examine the role of social capital in alleviating famine severity, in Column (3), we include the logarithm of the average number of charity organizations in a prefecture from 1880 to 1953. We do not observe a discernible impact of charity organizations *per se*. However, this masks important heterogeneity. In Column (4), we allow the impact of charity organizations to vary by *political radicalism*, as measured by the *negative* of the party membership density (PMD). As discussed above, a *lower* PMD was found to be associated with higher local political radicalism during the famine. We use the provincial-level PMD (i.e., party members per 100 persons) as of mid-1956 from Yang (1996). The coefficient of political radicalism is negative, meaning that if there were no charity organizations, a more radical GLF policy would reduce the size of survivors, which is in line with Yang (1996). However, we observe a positive coefficient on the interaction between charity organizations and political radicalism, indicating that rich social capital contained the damage caused by political radicalism. The results based on the SAR model are similar (see Table H in the Appendix).

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

VIII. Conclusion

The sharp drop in population during and after the Taiping Rebellion was similar to what was experienced in Europe following the Black Death (Voigtlander and Voth 2009, 2013a, 2013b; Jebwab, Johnson, and Koyama 2022), but its consequences are much less studied. 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 societal changes that facilitated long-term development in a *subset* of the Taiping regions the featured stronger post-rebellion property rights, local fiscal capacity, and growth in local charities. Such developmental changes are manifested in modern income levels, fiscal capacity, modern sector share, and human capital. The

Late Taiping regions also feature stronger trust in one's social network, stronger local political participation, as well as more resilience during the Great Famine one century after the rebellion. These findings are consistent with some of the hypotheses in the literatures that examine the long-term impacts of war on state capacity – specifically, it is argued that property rights facilitate long-term development; that wars often facilitate the development of state capacity; that social capacity benefits long-term development; and state that capacity and social capacity are complementary.

The Taiping Rebellion was a crucial turning point in Chinese history, for it marked the beginning of fiscal decentralization, a drastic increase in political and social participation by local elites, and the beginning of the China's modernization drive. Since then, China has continued to struggle with the choice between centralization and decentralization. While decentralization delayed the Qing Dynasty's collapse, it also led to Qing's eventual collapse (Sng 2014; Koyama, Moriguchi, and Sng 2018).[44] After the founding of the Republic of China in 1912, the central government remained weak, and there was a decade of complete decentralization characterized by a segmented China ruled by warlords. General Chiang Kai-shek attempted centralization but 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 this trend by moving towards fiscal centralization, which has greatly strengthened central state capacity. The journey of China from Qing Dynasty to the present could be characterized as a transition from weak state and weak society to strong state but still weak society. The evidence presented in our paper demonstrates that stronger social capacity can have substantial long-term benefits. In particular, given China's enormous state capacity today, cultivating civil society and associated social capacity would likely yield enormous payoffs for China.

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[44] 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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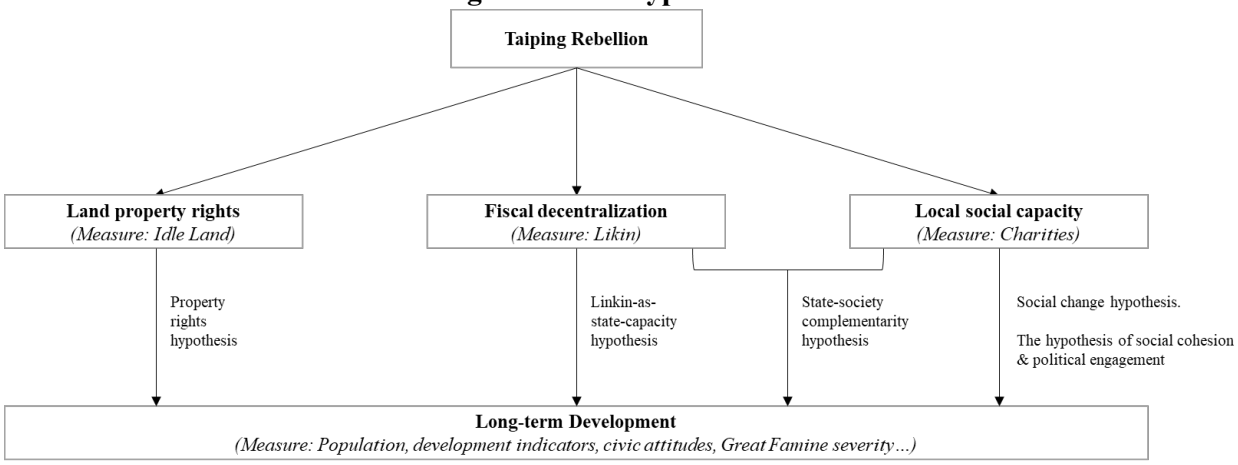
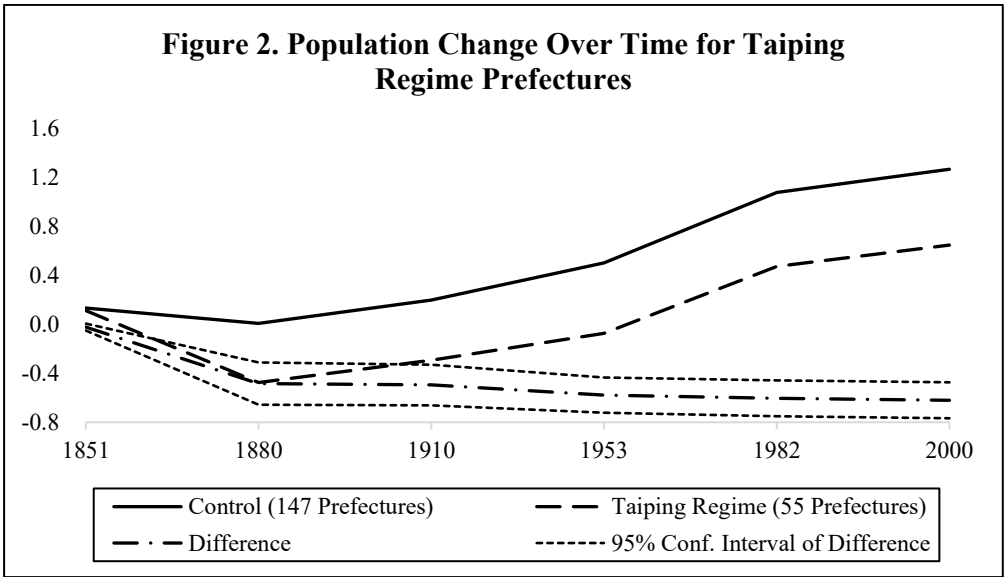
Figures

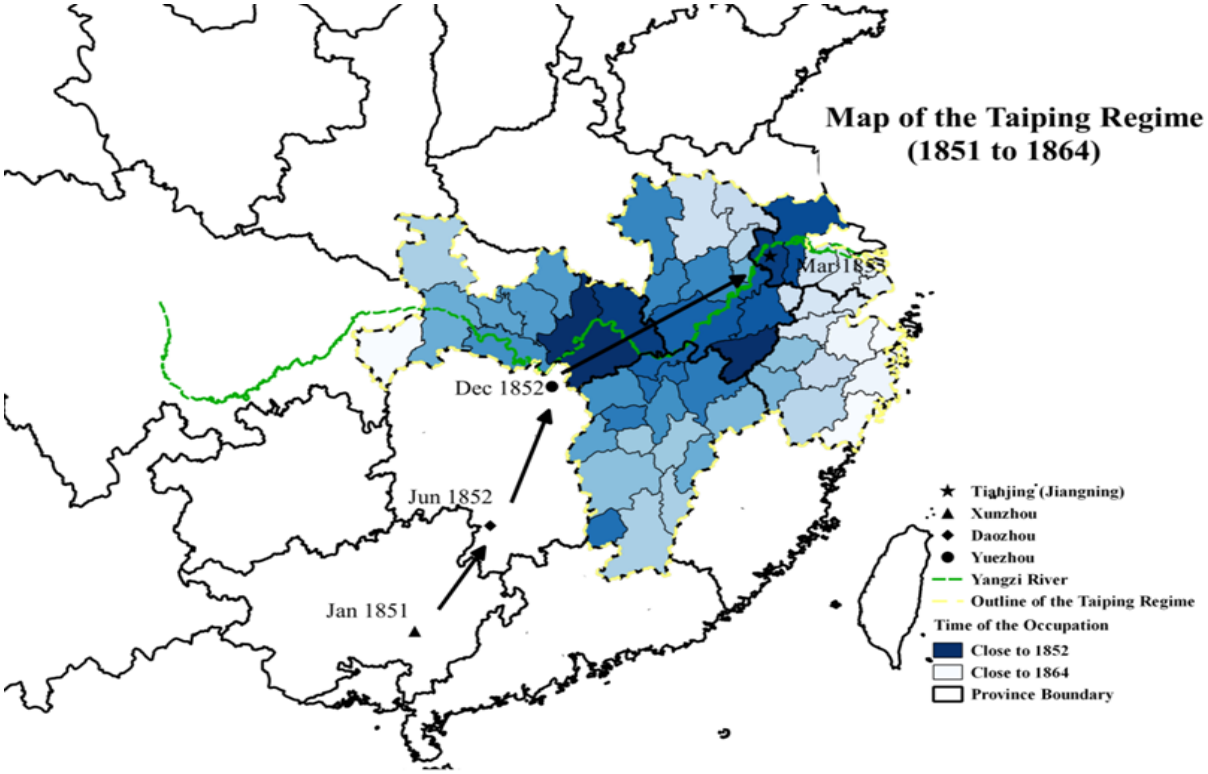
Figure 1. The Hypotheses





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

Figure 3. Map of the Taiping Areas (1851-1864)



Notes: Taiping Rebellion started in Xunzhou prefecture in Janurary in 1851. Moving along the arrow to the northeast, the Taiping Army occupied Jiangning Prefecture in March 1853. The depth of the blue color inside the Taiping Regime indicates the time when the Taiping Army occupied the prefecture, the deeper the color is, the earlier the prefecture was occupied by the Taiping Army.

Tables

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

	Control	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. Standard errors are in brackets. The differences indicate the difference of the mean between the treatment and the control groups.

Table 2. Balance Tests for Covariates

	Mean			t-test	
Variable	Non-Taiping	Taiping	% Bias	|t|	p>|t|
Distance to Grand Canal	13.195	12.896	24.500	1.240	0.219
Distance to Yangtze	11.994	11.644	29.200	1.280	0.203
Distance to East Coast	12.691	12.471	19.100	0.770	0.444
Tax per mu in1820	0.067	0.065	2.900	0.180	0.854
Chong Dummy	0.633	0.714	-17.200	0.860	0.394
Fan Dummy	0.878	0.959	-28.000	1.480	0.143
Pi Dummy	0.388	0.449	-12.400	0.610	0.544
Nan Dummy	0.714	0.694	5.000	0.220	0.827
Tea prefecture Dummy	0.898	0.673	55.800	2.790	0.006
Silk prefecture Dummy	0.061	0.102	-11.800	0.730	0.466
Num. of neighboring provinces	1.122	1.388	-31.900	1.450	0.151
War frequency 1776-1820	0.327	0.408	-14.400	0.510	0.612
Num. of Jinshi 1893-1820	12.041	14.184	-11.600	0.520	0.607

Table 3. Baseline and 2SLS Estimation

	Dependent Variable: Population Size (in log)							
	(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	-0.003	-0.010	-0.001	-0.003	-0.004	0.016	-0.002	-0.149
	[0.020]	[0.017]	[0.004]	[0.020]	[0.020]	[0.071]	[0.021]	[0.248]
Taiping *Year 1880	-0.456***	-0.396***	-0.113***	-0.444***	-0.460***	-0.207***	-0.382***	-0.810***
	[0.095]	[0.066]	[0.016]	[0.096]	[0.095]	[0.071]	[0.082]	[0.231]
Taiping *Year 1910	-0.438***	-0.370***	-0.103***	-0.426***	-0.442***	-0.190***	-0.395***	-0.830***
	[0.092]	[0.064]	[0.016]	[0.094]	[0.092]	[0.071]	[0.079]	[0.220]
Taiping *Year 1953	-0.514***	-0.428***	-0.112***	-0.500***	-0.513***	-0.231***	-0.480***	-1.168***
	[0.093]	[0.065]	[0.016]	[0.095]	[0.093]	[0.072]	[0.102]	[0.223]
Taiping *Year 1982	-0.444***	-0.381***	-0.099***	-0.429***	-0.443***	-0.188***	-0.419***	-1.057***
	[0.085]	[0.059]	[0.015]	[0.085]	[0.084]	[0.072]	[0.092]	[0.229]
Taiping *Year 2000	-0.431***	-0.389***	-0.098***	-0.419***	-0.430***	-0.168**	-0.387***	-1.183***
	[0.089]	[0.061]	[0.015]	[0.090]	[0.089]	[0.072]	[0.098]	[0.243]
Jinshi					-0.002			
					[0.001]			
War frequency	0.006	0.009	0.010	0.007	0.006	0.009**	4.894***	0.018***
	[0.008]	[0.008]	[0.007]	[0.008]	[0.007]	[0.004]	[0.026]	[0.006]
Observations	1,862	1862	1862	1820	1862	1,862	728	1,862
R-squared	0.796	0.800	0.805	0.798	0.796	0.151	0.829	0.775
Number of prefectures	266	266	266	260	266	266	104	266
CD test: population (in logs)	396	396	396	393	396			
CD test: residuals	11.7	11.7	11.7	11.5	11.7			
rho						2.024***		
						[0.112]		
lambda						2.276***		
						[0.020]		
log likelihood						213		
Kleibergen-Paap rk Wald F-stat.								22.01
Control	Y	Y	Y	Y	Y	Y	Y	Y
Cluster at Prefecture Level	Y	Y	Y	Y	Y	Y	N	N
Jinshi	N	N	N	N	Y	N	N	N
Prefecture FE, year FE	Y	Y	Y	Y	Y	Y	Y	Y

Note: **FS** contains the prefecture-year panel for 266 prefectures and seven time periods (from 1820 to 2000). **F-HWC** contains the prefecture-year panel for 260 prefectures (after dropping 6 prefectures, Wuchang, Anqing, Songjiang, Jiangning, Suzhou, Hangzhou, which were heavily affected by the Taiping Rebellion) and seven time periods (from 1820 to 2000). Matched sample (**PSM**) contains the prefecture-year panel for 104 prefectures and seven time periods (from 1820 to 2000). Only the estimation results of the key variables are presented. The control variables include the distance to Yangtze River, to the coastline, and to the Grand Canal, and the number of neighboring provinces; the duration of treaty ports; the durations of concessions and leased territories; the level of land taxes per unit of land; the total number of palace graduates per million people from 1793-1820; silk and tea prefectures dummy variables; indicators of the four post designations classified by the Qing government in 1820; and the frequency of wars since 1776. For regressions, standard errors are robust, and clustered at the prefecture level; for 2SLS, the standard errors are robust errors.

*** 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, Late Taiping

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

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

	Dependent Variable: Population Size (in log)		
	(1)	(2)	(3)
	OLS, FS	SAR, FS	OLS, Matched
Early Taiping*Year 1851	-0.005	0.018	-0.003
	[0.020]	[0.075]	[0.022]
Early Taiping*Year 1880	-0.447***	-0.202***	-0.426***
	[0.101]	[0.075]	[0.088]
Early Taiping*Year 1910	-0.425***	-0.164**	-0.424***
	[0.095]	[0.075]	[0.083]
Early Taiping*Year 1953	-0.558***	-0.263***	-0.548***
	[0.099]	[0.075]	[0.106]
Early Taiping*Year 1982	-0.472***	-0.202***	-0.463***
	[0.090]	[0.075]	[0.097]
Early Taiping*Year 2000	-0.452***	-0.176**	-0.424***
	[0.095]	[0.076]	[0.103]
Late Taiping*Year 1851	0.005	0.008	0.005
	[0.036]	[0.117]	[0.041]
Late Taiping*Year 1880	-0.503***	-0.232**	-0.078
	[0.193]	[0.117]	[0.186]
Late Taiping*Year 1910	-0.507***	-0.292**	-0.184
	[0.163]	[0.117]	[0.144]
Late Taiping*Year 1953	-0.314**	-0.115	-0.006
	[0.142]	[0.117]	[0.155]
Late Taiping*Year 1982	-0.317**	-0.139	-0.094
	[0.141]	[0.117]	[0.155]
Late Taiping*Year 2000	-0.340**	-0.142	-0.109
	[0.151]	[0.117]	[0.178]
Observations	1,862	1,862	728
R-squared	0.588	0.152	0.837
Number of prefectures	266	266	104
CD test: population (in logs)	396		
CD test: residuals	11.1		
Pesaran's test of cross-sectional independence	11.1		
rho		2.019***	
		[0.113]	
lambda		2.275***	
		[0.020]	
log likelihood		216.5	
Control	Y	Y	Y
Cluster at prefecture level	Y	Y	Y
Neighboring Fixed Effects	N	N	N
Jinshi	N	N	N
Year Fixed Effect	Y	Y	Y
Prefecture Fixed Effect	Y	Y	Y

Note: Full sample (FS) contains the prefecture-year panel for 266 prefectures and seven time periods (1820, 1851, 1880, 1910, 1953, 1982, and 2000). Matched sample contains 104 prefectures. Only the estimation results of the key variables are presented. Control includes the distance to Yangtze River, to the coastline, and to the Grand Canal; the number of neighboring provinces; the duration of treaty ports; the duration of concessions and leased territories; the level of land taxes; the total number of palace graduates per million people from 1793-1820; the silk and tea prefectures dummies; indicators of the four post designations classified by the Qing government in 1820; and the frequency of wars since 1776. For baseline, standard errors are robust, clustered at the prefecture level.

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

Table 6: Likin and Taiping Rebellion

	Dependent Variable: Likin per 1000 square km (in log) Matched Sample	
	(1)	(2)
Taiping *Year 1880	1.414***	
	[0.325]	
Taiping *Year 1910	1.133***	
	[0.240]	
Taiping *Year 1953	1.319***	
	[0.227]	
Early Taiping *Year 1880		1.103***
		[0.322]
Early Taiping *Year 1910		0.788***
		[0.227]
Early Taiping *Year 1953		1.083***
		[0.219]
Late Taiping *Year 1880		2.245***
		[0.342]
Late Taiping *Year 1910		2.055***
		[0.256]
Late Taiping *Year 1953		1.951***
		[0.247]
log Population in 1820*Year 1880	-0.252*	-0.185
	[0.136]	[0.140]
log Population in 1820*Year 1910	0.099	0.077
	[0.197]	[0.207]
log Population in 1820*Year 1953	-0.093	-0.124*
	[0.071]	[0.073]
Observations	416	416
R-squared	0.964	0.966
Number of prefectures	104	104
Control	N	N
Cluster at Prefecture Level	Y	Y
Year Fixed Effect	Y	Y
Prefecture Fixed Effect	Y	Y

Note: The matched sample contains the prefecture-year panel for 104 prefectures and four time periods, 1851, 1880, 1910, 1953. Only the estimation results of the key variables are presented. Likin revenues are converted into 1887 silver teal. Standard errors are robust, clustered at the prefecture level.

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

Table 7: Taiping Rebellion and Charities

	Dependent Variable: Charities (in log) Matched Sample	
	(1)	(2)
Taiping *Year 1851	-0.036	
	[0.083]	
Taiping *Year 1880	0.108	
	[0.119]	
Taiping *Year 1910	0.129	
	[0.119]	
Taiping *Year 1953	0.108	
	[0.122]	
War frequency	0.010	0.006
	[0.014]	[0.014]
Early Taiping*Year 1851		-0.056
		[0.083]
Early Taiping*Year 1880		0.071
		[0.118]
Early Taiping*Year 1910		0.064
		[0.118]
Early Taiping*Year 1953		0.040
		[0.120]
Late Taiping*Year 1851		0.086
		[0.141]
Late Taiping*Year 1880		0.389*
		[0.201]
Late Taiping*Year 1910		0.585***
		[0.201]
Late Taiping*Year 1953		0.615***
		[0.205]
Observations	520	520
R-squared	0.727	0.742
Number of prefectures	104	104
Control	Y	Y
Cluster at Prefecture Level	N	Y
No. of Jinshi in each period	N	N
Year Fixed Effect	Y	Y
Prefecture Fixed Effect	Y	Y

Note: The matched sample contains the prefecture-year panel for 104 prefectures and five time periods. Only the estimation results of the key variables are presented. Control includes the distance to Yangtze River, to the coastline, and to Grand Canal; the number of neighboring provinces; the duration of treaty ports; the duration of concessions and leased territories; the level of land taxes per unit of land; the total number of palace graduates per million people from 1793-1820; the silk and tea prefectures dummies; the indicators of the four post designations classified by the Qing government in 1820; and the frequency of wars since 1776. For baseline, standard errors are robust, clustered at the prefecture level.

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

Table 8. Taiping Rebellion, Likin, and Modern Outcomes

Dependent Variable:	GDPPC	Fis Rev	%Non-Ag	Avg. Schooling	Mortality Rate
	(1)	(2)	(3)	(4)	(5)
Panel A.					
Taiping	-0.041	0.341**	0.026	0.018	-0.386
	[0.104]	[0.163]	[0.018]	[0.018]	[0.245]
Ln (Edu_{1820})	0.026	-0.018	-0.004	0.000	0.066
	[0.061]	[0.092]	[0.012]	[0.014]	[0.140]
Ln (pre-TP Wars)	0.026	0.035	0.038**	0.027*	-0.177
	[0.093]	[0.145]	[0.018]	[0.014]	[0.174]
Controls	Y	Y	Y	Y	Y
Observations	75	75	80	80	80
R-squared	0.604	0.551	0.378	0.335	0.199
Panel B.					
Early Taiping	-0.226*	0.260	0.025	-0.020	-0.356
	[0.133]	[0.205]	[0.025]	[0.022]	[0.260]
Late Taiping	0.535***	0.974***	0.048	-0.009	0.689*
	[0.171]	[0.278]	[0.042]	[0.032]	[0.357]
Ln ($Likin_{1880}$)	-0.001	-0.052	-0.002	0.019**	-0.139**
	[0.020]	[0.033]	[0.006]	[0.009]	[0.066]
Ln (Edu_{1820})	0.081	0.004	-0.003	0.012	0.068
	[0.065]	[0.101]	[0.013]	[0.012]	[0.116]
Ln (pre-TP Wars)	0.013	0.056	0.039**	0.015	-0.123
	[0.096]	[0.146]	[0.019]	[0.018]	[0.168]
Controls	Y	Y	Y	Y	Y
Observations	75	75	80	80	80
R-squared	0.698	0.606	0.383	0.426	0.361

Note: The dependent variables are log GDP per capita (2010), log fiscal revenues per capita (2010), share of employment in non-agricultural sector (2000), log average years of schooling (2000), and mortality rate per thousand population (2000). The matched sample is generated through propensity score matching. In Panels A and B, the controls include log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Robust standard errors are reported in the parentheses.

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

Table 9. Interplay of Taiping Rebellion, Likin, Charity, and Modern Outcomes

Dependent Variable:	GDPPC	Fis Rev	%Non-Ag	Avg. Schooling	Mortality Rate
	(1)	(2)	(3)	(4)	(5)
Panel A.					
Early Taping	-0.206	0.285	0.022	-0.013	-0.397
	[0.125]	[0.196]	[0.025]	[0.022]	[0.282]
Late Taiping	0.417**	0.803**	0.033	-0.003	0.551
	[0.185]	[0.314]	[0.050]	[0.035]	[0.382]
Ln ($Likin_{1880}$)	-0.014	-0.065*	-0.002	0.012	-0.110*
	[0.024]	[0.037]	[0.007]	[0.008]	[0.065]
Ln (Avg $Charity_{1880\text{-}1953}$)	0.152***	0.198*	0.013	0.013	0.040
	[0.054]	[0.100]	[0.014]	[0.011]	[0.111]
Ln (Edu_{1820})	0.023	-0.078	-0.005	0.012	0.040
	[0.069]	[0.112]	[0.014]	[0.011]	[0.134]
Ln (pre-TP Wars)	0.026	0.079	0.035*	0.016	-0.123
	[0.089]	[0.136]	[0.019]	[0.017]	[0.167]
Controls	Y	Y	Y	Y	Y
Obs.	72	72	77	77	77
R-squared	0.730	0.639	0.394	0.350	0.279
Panel B.					
Early Taping	-0.257*	0.229	0.014	-0.019	-0.373
	[0.131]	[0.201]	[0.023]	[0.022]	[0.294]
Late Taiping	0.141	0.499	-0.018	-0.042	0.703
	[0.254]	[0.388]	[0.058]	[0.040]	[0.494]
Ln ($Likin_{1880}$)	-0.068**	-0.124**	-0.012	0.004	-0.080
	[0.031]	[0.049]	[0.009]	[0.011]	[0.088]
Ln (Avg $Charity_{1880\text{-}1953}$)	-0.374	-0.382	-0.085*	-0.059	0.328
	[0.227]	[0.351]	[0.048]	[0.054]	[0.488]
Ln (Avg $Charity_{1880\text{-}1953}$) * Ln ($Likin_{1880}$)	0.065**	0.071	0.012**	0.009	-0.035
	[0.029]	[0.043]	[0.006]	[0.006]	[0.058]
Ln (Edu_{1820})	-0.004	-0.108	-0.010	0.008	0.055
	[0.067]	[0.116]	[0.014]	[0.012]	[0.133]
Ln (pre-TP Wars)	-0.041	0.005	0.024	0.007	-0.090
	[0.097]	[0.148]	[0.018]	[0.015]	[0.182]
Controls	Y	Y	Y	Y	Y
Obs.	72	72	77	77	77
R-squared	0.752	0.653	0.431	0.381	0.284

Note: The dependent variables are log GDP per capita (2010), log fiscal revenues per capita (2010), the share of employment in non-agricultural sector (2000), log average years of schooling (2000), and mortality rate per thousand population (2000). The matched sample is generated through propensity score matching. In Panels A and B, the controls include log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Robust standard errors are reported in the parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10. Taiping Rebellion and Interpersonal Trust

Dependent Variable: Trust in	(1) Strangers	(2) Family	(3) Relatives	(4) Friends	(5) Coworkers	(6) Cadres
Panel A: Taiping dummy						
Taiping	-0.015	-0.001	0.059***	0.061*	0.066*	-0.083*
	[0.030]	[0.004]	[0.013]	[0.030]	[0.035]	[0.041]
Obs.	2597	2594	2593	2589	2505	2576
R-squared	0.056	0.014	0.015	0.023	0.037	0.045
Panel B: Early vs. Late Taiping						
Early Taiping	-0.021	0.000	0.057***	0.050	0.042	-0.103**
	[0.033]	[0.005]	[0.015]	[0.030]	[0.033]	[0.039]
Late Taiping	0.007	-0.009	0.067***	0.106*	0.164***	0.003
	[0.042]	[0.008]	[0.021]	[0.052]	[0.057]	[0.064]
Obs.	2597	2594	2593	2589	2505	2576
R-squared	0.056	0.014	0.016	0.024	0.040	0.048
Panel C: Social capacity						
Early Taiping	0.001	0.007	0.058**	0.082*	0.076	-0.049
	[0.046]	[0.006]	[0.022]	[0.040]	[0.045]	[0.057]
Late Taiping	0.031	-0.003	0.071***	0.127**	0.172***	0.043
	[0.044]	[0.009]	[0.021]	[0.047]	[0.060]	[0.066]
ln(Avg charity 1880-1953)	-0.022	-0.004	-0.009	-0.010	0.008	-0.021
	[0.023]	[0.004]	[0.012]	[0.020]	[0.023]	[0.029]
Obs.	2510	2507	2506	2502	2420	2490
R-squared	0.056	0.016	0.016	0.023	0.038	0.050
Baseline controls	Y	Y	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y	Y	Y

Note: The dependent variables are trust in different groups. The matched sample is generated through propensity score matching. All regressions control for log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Individual covariates are also included, including indicators for gender, educational attainment, age, and urban residence. Robust standard errors clustered at the prefecture level are reported in brackets.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 11. Taiping Rebellion and Civic Engagement

Dependent Variable:	(1) Civil Assertiveness	(2) Political Efficacy	(3) Attention to Politics	(4) Political Confidence: Principal Component of (1), (2), (3)	(5) Engagement in Local Affairs
Panel A: Taiping dummy					
Taiping	0.104***	0.072***	0.005	0.059***	0.020
	[0.025]	[0.024]	[0.037]	[0.021]	[0.028]
Obs.	2584	2592	2591	2580	2594
R-squared	0.111	0.090	0.176	0.227	0.045
Panel B: Early vs. Late Taiping					
Early Taiping	0.099***	0.080***	-0.019	0.054**	0.006
	[0.025]	[0.028]	[0.034]	[0.021]	[0.030]
Late Taiping	0.127***	0.033	0.107**	0.081**	0.083*
	[0.044]	[0.042]	[0.040]	[0.035]	[0.048]
Obs.	2584	2592	2591	2580	2594
R-squared	0.112	0.091	0.182	0.228	0.047
Panel C: Social capacity					
Early Taiping	0.063**	0.072*	-0.022	0.040	0.032
	[0.027]	[0.038]	[0.037]	[0.025]	[0.036]
Late Taiping	0.076**	0.029	0.082**	0.059*	0.109**
	[0.037]	[0.047]	[0.037]	[0.031]	[0.052]
ln(Avg charity 1880-1953)	0.051***	-0.001	0.034*	0.023*	-0.023
	[0.015]	[0.020]	[0.017]	[0.013]	[0.014]
Obs.	2497	2505	2504	2493	2507
R-squared	0.112	0.091	0.191	0.231	0.045
Panel D: Interaction of social and state capacities					
Early Taiping	0.050	0.053	-0.026	0.027	0.031
	[0.031]	[0.038]	[0.037]	[0.024]	[0.036]
Late Taiping	0.090***	0.054	0.072**	0.069***	0.098*
	[0.028]	[0.036]	[0.034]	[0.023]	[0.052]
PMD	0.245**	0.363***	0.055	0.238***	-0.002
	[0.106]	[0.099]	[0.115]	[0.080]	[0.106]
ln(Avg charity 1880-1953)	0.165***	0.174***	0.032	0.127***	-0.047
	[0.040]	[0.042]	[0.048]	[0.032]	[0.042]
ln(Avg charity 1880-1953)*PMD	-0.093***	-0.144***	0.003	-0.085***	0.021
	[0.027]	[0.028]	[0.036]	[0.021]	[0.035]
Obs.	2497	2505	2504	2493	2507
R-squared	0.115	0.102	0.192	0.237	0.046
Baseline controls	Y	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y	Y

Note: The dependent variables are measures of civic engagement. The matched sample is generated through propensity score matching. All regressions control for log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Individual covariates are also included, including indicators for gender, educational attainment, age, and urban residence. Robust standard errors clustered at the prefecture level are reported in brackets.

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

Table 12. Taiping Rebellion and Great Chinese Famine (1959-61)

	Dependent Variable: Famine Control			
	(1)	(2)	(3)	(4)
Taiping	0.065***			
	[0.024]			
Early Taiping		0.060**	0.062**	0.053*
		[0.028]	[0.028]	[0.027]
Late Taiping		0.084*	0.093**	0.118**
		[0.042]	[0.044]	[0.046]
Political Radicalism (i.e., -PMD)				-0.423***
				[0.121]
ln(Avg charity 1880-1953)			-0.008	0.113***
			[0.014]	[0.039]
ln(Avg charity 1880-1953) * Political Radicalism				0.126***
				[0.035]
ln(Jinshi 1820)	-0.001	0.001	0.003	-0.003
	[0.016]	[0.016]	[0.017]	[0.015]
ln(Pre-Taiping wars)	0.033*	0.032*	0.032*	0.029*
	[0.018]	[0.018]	[0.019]	[0.016]
DV mean	0.448	0.448	0.446	0.446
Controls	Y	Y	Y	Y
Observations	74	74	72	70
R-squared	0.304	0.307	0.315	0.474

Note: The dependent variable is "famine control", a higher value of which means a lower famine severity. The matched sample is generated through propensity score matching. All regressions control for log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Robust standard errors are reported in brackets.

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

Appendix

Table A. Distribution of Prefectures in Different Groups

	Taiping Treatment		No Taiping Jurisdiction	Total
	Early Taiping	Late Taiping		
Provinces within Taping	37	18	6	61
Anhui	*13*		*0*	*13*
Jiangxi	*14*		*0*	*14*
Hubei	*10*		*1*	*11*
Jiangsu		*7*	*5*	*12*
Zhejiang		*11*	*0*	*11*
Province outside Taiping	0	0	142	*205*
Whole Sample	37	18	147	*266*

Note. The control group consists of non-Taiping-jurisdiction prefectures. The treatment group consists of prefecture officially under the Taiping jurisdiction.

Table B. Variable Definitions and Resources

Variables	Definitions and source
ln(Population)	Population size of a Prefecture in 10,000 (in logs) 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 the prefecture was under Taiping control and in Anhui, Jiangxi, or Hubei Province, which experienced the early phase of the land policy of Taiping. Source: Bol and Ge (2007), Hua (1991).
Late Taiping	Equal to 1 if the prefecture was under Taiping control and is in Zhejiang or Jiangsu Province, which experienced the late phase of the land policy of Taiping. Source: Bol and Ge (2007), Hua (1991).
log (No. of Battles)	Number of Battles in the prefecture during Taiping Rebellion (in logs). Source: Taiping tianguo dilizhi: (Geographical Records of Taiping Heavenly Kingdom) Source: Hua (1991).
log (Duration)	Duration (days) of Taiping occupation (in logs). Source: as above.
Distance to XXX	Distance (in meters) from the seat of the prefecture to XXX. XXX could be Yangtze River, or Coast, or Grand Canal. Source: Bol and Ge (2007).
Distance to Nanjing	Standardize (log) distance to Nanjing. Source: Bol and Ge (2007).
Land tax per mu in 1820	The farm land tax in taels of silver per mu in each prefecture in 1820. Source: Liang (1980)
Number of Palace Graduate, 1793 to 1820	The number of people received Palace Graduate (*Jinshi*) title per million population in each prefecture from 1790 to 1820. Source: Jiang (2007).
Number of Palace Graduate, time-varying	The number of people received Palace Graduate (*Jinshi*) title per million population in each prefecture between the end of the last period and the end of this period. Source: Jiang (2007). For the base year 1820, the measure refers to that between 1793 and 1820.
Number of Neighboring Provinces	Number of Neighboring Province for the 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 the prefecture importance level was classified in 1820 as 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	Duration of the Treaty Port in years before 1949. Source: Yan (1955).
Duration of the Concession	Duration of the Concession in years before 1949. Fei (1991).
Duration of the Leased Territory	Duration of the leased territory in years before 1949. Fei (1991).
Frequency of Wars since 1776	The number of wars/battles since 1776 up to the sample 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).
Prefecture Capital Seat	Equal to 1 if the town hall of prefecture is located in the county. 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 per 1000 square kilometers	The annual provincial revenue of likin in taels of silver per 1000 square kilometers for the province. Source: Luo (1936); The Second Historical Archives of China (1996).
ln (GDP PC 2010)	GDP per capital in logs, Yearbook of China Region Economic Statistics, 2011
ln (Fis Rev 2010)	Revenue of Local Government per Capita in 2010 in logs, Yearbook of China Region Economic Statistics, 2011
Share GDP: nonAg 2000	Share of population in the non-agricultural sector in 2000. Source: as above.
ln (Sch. 2000)	Average years of schooling in 2000 (in logs). Source: as above.
Mortality rate	Mortality rate (the number of deaths per 1,000 residents). Source: as above.
No. of Charities	Number of charities in logs. Source: Koyama and Xue (2015) and Liang (2001).
Party Member Density (PMD)	Provincial level percentage of population who were 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 $Famine\ Control_i = \frac{\text{Size of cohorts born in 1959–61, prefecture } i}{\text{Size of cohorts born in 1954–57, prefecture } i}$. Source: 1990 population census microfile (from IPUMS).
Famine Control (Kasahara and Li 2020)	Alternative measure for famine severity. Used for robustness. Defined as $Famine\ Control_i = \frac{\text{Size of cohorts born in 1959–61, prefecture } i}{\text{Size of cohorts born in 1953–65, prefecture } i}$. Source: as above.
Famine Control (Chen and Yang 2015)	Alternative measure for famine severity. Used for robustness. Defined as $Famine\ Control_i = \frac{\text{Size of cohorts born in 1959–61, prefecture } i}{\text{Projected size of cohorts born in 1959–61, prefecture } i}$. Source: as above.

Table B. Variable Definitions and Resources (cont'd)

Civil Assertiveness	Equal to 1 if an individual does not agree with the statement that "people should comply with the government." Source: China General Social Survey in 2010.
Political Efficacy	An average score between 0 and 1 based on an individual's responses to three questions (0 if yes and 1 otherwise): (1) "the working of government is so complicated that I am unable to understand"; (2) "a person like me has no influence on the government"; (3) "officials do not care about the opinions of people like me"; (4) "I feel unconfident when talking about politics with other people." Source: as above.
Attention to Politics	Equal to 1 if an individual reports yes to questions on either "regularly reading books, newspapers, and journals about politics" or "regularly discussing politics with others." Source: as above.
Political Confidence	The first principal component of "Civil Assertiveness", "Political Efficacy", and "Political Confidence." It is normalized to be within 0 and 1. Source: as above (with authors' calculation).
Engagement in Local Affairs	Equal to 1 if an individual reports having 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 Strangers	Equal to 1 if an individual reports trusting strangers. Source: as above.
Trust in Families	Equal to 1 if an individual reports trusting families. Source: as above.
Trust in Relatives	Equal to 1 if an individual reports trusting relatives. Source: as above.
Trust in Friends	Equal to 1 if an individual reports trusting friends. Source: as above.
Trust in Coworkers	Equal to 1 if an individual reports trusting coworkers. Source: as above.
Trust in Cadres	Equal to 1 if an individual reports trusting cadres. Source: as above.

Table C. Summary Statistics

Variable	Level	Observations	Mean	Std. Dev.	Min	Max
Dependent Variable						
Population Size (in logs)	Prefecture-year	1862	4.854	1.120	1.194	8.173
ln (GDP PC 2010)	Prefecture	186	9.846	0.618	8.421	11.927
ln (Fis Rev 2010)	Prefecture	186	-2.415	0.799	-4.166	0.212
Share GDP: nonAg 2000	Prefecture	192	0.210	0.102	0.062	0.738
ln (Sch. 2000)	Prefecture	192	1.989	0.112	1.625	2.234
Mortality rate	Prefecture	192	6.139	0.907	3.174	8.933
Key Independent Variables						
Taiping	Prefecture	266	0.207	0.406	0	1
Taiping *log(No. of Battles)	Prefecture	266	0.817	1.072	0	4
Taiping*log(Duration)	Prefecture	266	2.097	3.067	0	10
Early Taiping	Prefecture	266	0.068	0.252	0	1
Late Taiping	Prefecture	266	0.139	0.347	0	1
Control Variables						
Distance to Yangtze	Prefecture	266	13.027	1.297	5.582	14.552
Distance to Coast	Prefecture	266	12.484	1.255	5.066	14.038
Distance to Grand Canal	Prefecture	266	12.710	1.152	7.572	14.448
Land Tax per Mu in 1820	Prefecture	266	0.080	0.076	0.002	0.664
Number of Jinshi from 1793 to 1820	Prefecture	266	10.508	17.319	0	148
Number of Neighboring Provinces	Prefecture	266	1.083	0.825	0	3
Tea Prefecture Dummy	Prefecture	266	0.500	0.501	0	1
Silk Prefecture Dummy	Prefecture	266	0.083	0.276	0	1
Post Designation Chong in 1820	Prefecture	266	0.658	0.475	0	1
Post Designation Fan in 1820	Prefecture	266	0.917	0.276	0	1
Post Designation Pi in 1820	Prefecture	266	0.380	0.486	0	1
Post Designation Nan in 1820	Prefecture	266	0.805	0.397	0	1
Duration of the Treaty port	Prefecture-year	1862	5.214	17.729	0	106
Duration of the Concession	Prefecture-year	1862	1.425	9.767	0	99
Duration of the Leased Territory	Prefecture-year	1862	0.367	3.887	0	58
Frequency of Wars since 1776	Prefecture-year	1862	2.346	2.940	0	17
Number of Jinshi in each prefecture by period	Prefecture-year	1862	9.515	23.135	0	302
Instruments and Others						
Longitude	Prefecture	266	111.596	5.746	95.789	121.543
ln (1+Charity in 1776)	Prefecture	145	1.266	0.898	0	3.584
ln (1+Charity in 1820)	Prefecture	145	1.515	0.967	0	4.317
ln (1+Charity in 1851)	Prefecture	145	1.761	1.024	0	4.997
ln (1+Charity in 1880)	Prefecture	145	2.079	1.162	0	5.241
ln (1+Charity in 1910)	Prefecture	145	2.284	1.174	0	5.433
ln (1+Charity in 1953)	Prefecture	145	2.318	1.159	0.693	5.707
ln (Avg. Charity in 1880-1953)	Prefecture	145	2.016	1.368	-1.098	5.398
ln (Likin per 1000 square km in 1880)	Prefecture	266	6.561	2.996	0.000	10.075
ln (Likin per 1000 square km in 1910)	Prefecture	266	7.658	1.280	6.424	10.193
ln (Likin per 1000 square km in 1953)	Prefecture	266	8.527	1.102	6.084	10.426
Agriculture Data in 1915						
Percentage of Idle land	County	332	4.460	9.838	0	75.105
Taiping Regime	County	332	0.741	0.439	0	1
Early Taiping	County	332	0.455	0.499	0	1
Late Taiping	County	332	0.286	0.453	0	1
Initial Likin (1880)	County	332	9.154	0.976	0	10.075
standardized log distance to Nanjing	County	332	0	0.997	-13.190	1.176
Prefecture Capital Seat	County	332	0.196	0.397	0	1
Greatest Important County in 1820	County	332	0.057	0.233	0	1
Trade Center in 1915	County	332	0.386	0.487	0	1

Table C. Summary Statistics (cont'd)

Party Member Density and Great Famine						
Party Member Density (PMD) (%)	Province	15	1.076	0.375	0.710	2.140
Political Radicalism (-1*PMD)	Province	15	-1.076	0.375	-2.140	-0.710
Famine Control	Prefecture	74	0.448	0.114	0.201	0.658
Famine Control (Kasahara and Li 2020)	Prefecture	74	0.136	0.033	0.061	0.191
Famine Control (Chen and Yang 2015)	Prefecture	74	0.499	0.149	0.206	0.769
CGSS Variables						
Civil Assertiveness	Individual	2587	0.304	0.460	0	1
Political Efficacy	Individual	2596	0.455	0.316	0	1
Attention to Politics	Individual	2594	0.213	0.410	0	1
Political Confidence	Individual	2583	0.341	0.250	0	1
Engagement in Local Affairs	Individual	2598	0.185	0.388	0	1
Trust in Strangers	Individual	2600	0.637	0.481	0	1
Trust in Family	Individual	2598	0.978	0.145	0	1
Trust in Relatives	Individual	2597	0.888	0.315	0	1
Trust in Friends	Individual	2593	0.700	0.458	0	1
Trust in Coworkers	Individual	2509	0.505	0.500	0	1
Trust in Cadres	Individual	2580	0.382	0.486	0	1

Table D. 2SLS Estimation with One Endogenous Variable

Panel A. Second Stage					
	Pop1880	Pop1910	Pop1953	Pop1982	Pop2000
Taiping	-0.734***	-0.766***	-1.103***	-0.992***	-1.099***
	[0.233]	[0.225]	[0.275]	[0.277]	[0.294]
Observations	798	798	798	798	798
R-squared	0.322	0.231	0.404	0.799	0.841
Panel B. First Stage					
Longitude	0.039***	0.040***	0.036***	0.036***	0.037***
	[0.006]	[0.007]	[0.007]	[0.007]	[0.008]
Observations	798	798	798	798	798
F Test	37.46	35.46	28.08	28.08	28.08
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	0.040**	-0.003	0.001	-0.002	-0.11	-0.011	-0.004	-0.027***	-0.002
	[0.016]	[0.003]	[0.009]	[0.001]	[0.341]	[0.009]	[0.006]	[0.010]	[0.009]
Observations	266	266	266	266	266	266	266	266	266
R-squared	0.485	0.971	0.106	0.104	0.364	0.249	0.146	0.221	0.195
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 the 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 year 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 E. Taiping Rebellion, Likin, and Modern Outcomes – SAR

Dependent Variable:	GDPPC	Fis Rev	%Non-Ag	Avg. Schooling	Mortality Rate
	(1)	(2)	(3)	(4)	(5)
Panel A.					
Taiping	-0.228	0.402**	0.023	0.002	-0.213
	[0.159]	[0.195]	[0.020]	[0.024]	[0.292]
Ln (Edu_{1820})	0.014	-0.029	0.001	0.000	0.095
	[0.061]	[0.092]	[0.011]	[0.011]	[0.111]
Ln (pre-TP Wars)	0.063	0.059	0.036***	0.029**	-0.178
	[0.080]	[0.120]	[0.014]	[0.014]	[0.146]
Lambda	0.203	0.512	0.236	0.105	-0.519
	[0.175]	[1.004]	[0.432]	[0.090]	[0.559]
Rho	5.445***	2.372	-5.706***	-0.858	5.234***
	[0.562]	[1.450]	[1.025]	[1.948]	[0.511]
Controls	Y	Y	Y	Y	Y
Obs.	75	75	80	80	80
Log likelihood	-36.900	-66.340	96.293	96.446	-90.698
Panel B.					
Early Taiping	-0.245*	0.265	0.020	-0.021	-0.218
	[0.143]	[0.210]	[0.022]	[0.022]	[0.262]
Late Taiping	0.504**	0.943***	0.053*	-0.006	0.837**
	[0.219]	[0.267]	[0.032]	[0.031]	[0.387]
Ln ($Likin_{1880}$)	-0.004	-0.052	-0.001	0.020***	-0.118*
	[0.032]	[0.047]	[0.006]	[0.005]	[0.060]
Ln (Edu_{1820})	0.075	-0.010	0.004	0.015	0.089
	[0.065]	[0.093]	[0.012]	[0.011]	[0.113]
Ln (pre-TP Wars)	0.018	0.073	0.037**	0.016	-0.155
	[0.079]	[0.119]	[0.015]	[0.014]	[0.142]
Lambda	0.039	-0.084	0.213	0.001	-0.392
	[0.187]	[1.200]	[0.449]	[0.074]	[0.559]
Rho	0.400	2.109	-5.683***	-2.240	1.070
	[3.197]	[1.869]	[0.999]	[1.371]	[2.582]
Controls	Y	Y	Y	Y	Y
Obs.	75	75	80	80	80
Log likelihood	-29.366	-62.262	97.041	102.445	-83.859

Note: The dependent variables are log GDP per capita (2010), log fiscal revenues per capita (2010), the share of employment in non-agricultural sector (2000), log average years of schooling (2000), and mortality rate per thousand population (2000). The matched sample is generated through propensity score matching. In Panels A and B, the controls used include log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Robust standard errors are reported in the parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table F. Interplay of Taiping Rebellion, Likin, Charity, and Modern Outcomes: SAR Results

Dependent Variable:	GDPPC	Fis Rev	%Non-Ag	Avg. Schooling	Mortality Rate
	(1)	(2)	(3)	(4)	(5)
Panel A.					
Early Taping	-0.178	0.326	0.019	-0.011	-0.206
	[0.133]	[0.211]	[0.025]	[0.022]	[0.261]
Late Taiping	0.464**	0.806***	0.039	0.001	0.756**
	[0.182]	[0.268]	[0.034]	[0.030]	[0.370]
Ln ($Likin_{1880}$)	-0.010	-0.060	-0.002	0.012**	-0.081
	[0.032]	[0.050]	[0.006]	[0.006]	[0.065]
Ln (Avg $Charity_{1880\text{-}1953}$)	0.158***	0.197**	0.014	0.014	0.056
	[0.050]	[0.077]	[0.010]	[0.009]	[0.094]
Ln (Edu_{1820})	0.031	-0.088	-0.001	0.015	0.062
	[0.064]	[0.097]	[0.012]	[0.011]	[0.118]
Ln (pre-TP Wars)	0.019	0.090	0.035**	0.016	-0.164
	[0.074]	[0.117]	[0.015]	[0.013]	[0.142]
Lambda	-0.057	0.245	0.206	0.001	-0.558
	[0.114]	[1.040]	[0.519]	[0.069]	[0.476]
Rho	-1.061	1.626	-3.144***	-2.527**	0.651
	[2.422]	[2.316]	[0.766]	[1.165]	[2.694]
Controls	Y	Y	Y	Y	Y
Obs.	72	72	77	77	77
Log likelihood	-24.873	-57.595	93.249	103.510	-79.667
Panel B.					
Early Taping	-0.210	0.273	0.017	-0.013	-0.199
	[0.128]	[0.211]	[0.023]	[0.022]	[0.260]
Late Taiping	0.204	0.484	-0.006	-0.037	0.842**
	[0.201]	[0.314]	[0.038]	[0.034]	[0.419]
Ln ($Likin_{1880}$)	-0.063*	-0.123**	-0.012	0.004	-0.063
	[0.036]	[0.060]	[0.007]	[0.007]	[0.077]
Ln (Avg $Charity_{1880\text{-}1953}$)	-0.380*	-0.426	-0.082*	-0.065*	0.231
	[0.214]	[0.343]	[0.042]	[0.038]	[0.416]
Ln (Avg $Charity_{1880\text{-}1953}$)* Ln ($Likin_{1880}$)	0.066**	0.076*	0.012**	0.010**	-0.022
	[0.026]	[0.041]	[0.005]	[0.005]	[0.050]
Ln (Edu_{1820})	0.005	-0.118	-0.004	0.011	0.070
	[0.061]	[0.096]	[0.012]	[0.011]	[0.120]
Ln (pre-TP Wars)	-0.054	0.012	0.020	0.006	-0.142
	[0.077]	[0.124]	[0.015]	[0.013]	[0.151]
Lambda	-0.094	0.287	-0.114	-0.035	-0.539
	[0.110]	[1.188]	[0.459]	[0.068]	[0.476]
Rho	-1.184	1.746	-5.538***	-2.707	0.579
	[2.298]	[2.414]	[0.936]	[2.057]	[2.790]
Controls	Y	Y	Y	Y	Y
Obs.	72	72	77	77	77
Log likelihood	-21.702	-55.911	96.670	105.835	-79.574

Note: Dependent variables are log GDP per capita (2010), log fiscal revenues per capita (2010), share of employment in non-agricultural sector (2000), log average years of schooling (2000), and mortality rate per thousand population (2000). The matched sample is generated through propensity score matching. In Panels A and B, the controls used include log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), the dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Robust standard errors are reported in the parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table G. Taiping Rebellion and Great Chinese Famine (1959-61): Alternative Measures

	DV: Famine Control (Kasahara and Li 2020)				DV: Famine Control (Chen and Yang 2015)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Taiping	0.018**				0.080***			
	[0.007]				[0.030]			
Early Taiping		0.016*	0.016*	0.014*		0.078**	0.071*	0.059*
		[0.008]	[0.008]	[0.008]		[0.036]	[0.035]	[0.032]
Late Taiping		0.025**	0.028**	0.035***		0.088*	0.103**	0.140**
		[0.011]	[0.012]	[0.012]		[0.049]	[0.051]	[0.053]
PMD				0.130***				0.615***
				[0.034]				[0.141]
ln(Avg charity 1880-1953)			-0.003	0.032***			-0.006	0.169***
			[0.004]	[0.011]			[0.020]	[0.046]
ln(Avg charity 1880-1953)*PMD				-0.036***				-0.180***
				[0.010]				[0.041]
ln(Jinshi 1820)	-0.000	0.001	0.001	-0.001	-0.013	-0.012	-0.002	-0.013
	[0.005]	[0.004]	[0.005]	[0.004]	[0.021]	[0.022]	[0.021]	[0.018]
ln(Pre-Taiping wars)	0.010*	0.010*	0.010*	0.010**	0.051**	0.051**	0.048*	0.045**
	[0.005]	[0.005]	[0.005]	[0.004]	[0.025]	[0.025]	[0.025]	[0.020]
DV mean	0.136	0.136	0.136	0.136	0.499	0.499	0.502	0.501
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Observations	74	74	72	70	74	74	72	70
R-squared	0.338	0.343	0.349	0.517	0.334	0.334	0.346	0.542

Note: The dependent variable is "famine control", a higher value of which means a lower famine severity. The matched sample is generated through propensity score matching. All regressions control for log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Robust standard errors are reported in brackets.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table H. Taiping Rebellion and Great Chinese Famine (1959-61): SAR Results

	Dependent Variable: Famine Control			
	(1)	(2)	(3)	(4)
Taiping	0.025			
	[0.028]			
Early Taiping		-0.016	-0.008	0.001
		[0.031]	[0.030]	[0.028]
Late Taiping		0.086*	0.116***	0.113***
		[0.046]	[0.041]	[0.038]
PMD				0.229**
				[0.090]
ln(Avg charity 1880-1953)			-0.011	0.044
			[0.010]	[0.029]
ln(Avg charity 1880-1953)*PMD				-0.059**
				[0.028]
ln(Jinshi 1820)	-0.012	-0.009	-0.005	-0.005
	[0.013]	[0.013]	[0.013]	[0.012]
ln(Pre-Taiping wars)	0.009	0.004	0.003	-0.001
	[0.016]	[0.016]	[0.016]	[0.015]
Lambda	0.454	0.824**	0.937**	0.847**
	[0.353]	[0.401]	[0.377]	[0.360]
Rho	12.393***	15.808***	12.479***	12.460***
	[1.437]	[1.229]	[1.218]	[1.407]
DV mean	0.448	0.448	0.446	0.446
Controls	Y	Y	Y	Y
Observations	74	74	72	70
Log likelihood	82.244	84.922	83.971	87.701

Note: The dependent variable is "famine control", a higher value of which means a lower famine severity. The matched sample is generated through propensity score matching. All regressions control for log distance to the Yangtze, log distance 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 (Chong, Fan, Pi, and Nan), dummies for tea and silk production, and the number of wars prior to Taiping rebellion. Robust standard errors are reported in brackets.
* p < 0.1, ** p < 0.05, *** p < 0.01.