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The Merit of Misfortune: Taiping Rebellion and the Rise of Indirect Taxation in Modern China, 1850s-1900s

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The Merit of Misfortune: Taiping Rebellion and the Rise of Indirect Taxation in Modern China, 1850s-1900s

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Abstract

This article revisits the role of war in state development but goes beyond the scope of Western European nation states. It focuses on the relationship between political disorder and indirect taxation with micro-level evidence in late imperial China. With cross-sectional data for 266 prefectures this article employs quantitative methods to test the positive link between the warfare during the Taiping Rebellion (the greatest threat for the Qing reign) and the rapid rise and pervasive persistence of autonomous self-serving indirect taxation (lijin) institutions. The withering central fiscal role with the growing local fiscal-military needs accounted for this change. This article draws more economic and political implications by linking local fiscal autonomy to the Late Qing industrialization and the development of representative politics. The results demonstrate that the warfare by the Taiping Rebellion provided an unexpected opportunity for China's fiscal modernization in a bottom-up way and that the impact was long-lasting.

1. Introduction

Political disorder matters. There is a spectacular literature on the role of political disorder in modern state formation and development (Downing, 1992; Ertman, 1997; Zhao, 2015), and many works emphasize how political disorder is conducive to the growth of fiscal capacity (Brewer, 1988; Tilly, 1990; Epstein, 2002). Fiscal capacity, the ability of a state to extract and redistribute resources, is a critical nexus of both state development and economic growth (Ardant, 1975; Mathias and O'Brien, 1976; Besley and Persson, 2011; Dincecco and Katz, 2016; Bardhan, 2016; Johnson and Koyama, 2017). Schumpeter (1954) made the ground-breaking contribution by outlining late

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medieval transitions from the 'domain state' to the 'tax state' and the European leap from feudalism to capitalism. Political scientists and historical sociologists have been echoing this German tradition and recognizing the importance of studying fiscal capacities (Evans et al., 1985; Mann, 1986; Finer, 1999). More recently, interactions between political disorder and fiscal modernization enter the perspective of new institutional economists who cultivate considerable empirical evidence especially from Western Europe (North and Weingast, 1989; Fratianni and Spinelli, 2006; Drelichman and Voth, 2008).

With the European experiences, scholarship agrees on the fundamental role of frequent wars in strengthening the state fiscal capacities and accelerating the making of modern nation states, and there are several widely accepted characteristics for a modern fiscal state: first, a consistent legal system and a consolidated monetary and fiscal regime under independent sovereignty; second, effective power centralization, a professional taxation bureaucracy with minimal tax-farming; third, a broad tax base and more importantly, a credit-based fiscal system with sustainable credit tools (Dickson, 1967; O'Brien, 1988; North and Weingast, 1989; Ormrod et al. 1999; Bonney, 1999; O'Brien and Hunt, 1999; Dincecco, 2009).

However, there are ongoing debates on fiscal-military state theories, including the validation of these criteria and the mechanisms among warfare, fiscal capacity and economic development. Firstly, the role of some intermediate variables in the key narrative is ambiguous from case to case, such as an effective legal system (Harris, 2000), professional civil services (Brewer, 1988) and property rights protection (Bogart and Richardson, 2009). Secondly, the literature often overlooks alternative explanations like technological innovations in accounting systems (Kiser and Kane, 2001); meanwhile, it investigates few alternative state incomes like monopoly sales (Ogilvie, 1992; Johnson and Koyama, 2014). Thirdly, existing works focus dominantly on the revenue side, namely the extractive capacity of a state, while the expenditure such as infrastructure spending is less studied (Baugh, 1965; Braddick, 2000; Karaman and Pamuk, 2013; Rasul and Rogger, 2016).

Finally, the above framework mainly employs European evidence but revisions with a global perspective are lacking. To construct a general framework of political changes and fiscal

modernization, numerous scholars provide various and heterogenous African and Asian cases on political modernization and fiscal development (Gardner, 2012; He, 2013; Frankema and Van Waijenburg, 2014; Van Waijenburg, 2018; Ko et al., 2018). In such diverse cases, the role of political disorder in the strengthening of fiscal capacities becomes highly contingent as there are more complex interactions between fiscal regime and local endowments, cultural and socioeconomic conditions, and exogenous shocks such as colonization. A comparative historical perspective matters, and the 19th-century China offers us a perfect case to revisit the relationship between political disorder and fiscal development.

This article focuses on how the static, centralized and land-tax-based fiscal regime of the Qing Empire (Wang, 1973; Zelin, 1984; Iwai, 2004) was transformed into a responsive, decentralized and diverse one after the 1850s (Zhou, 2000; Ni, 2017). Among numerous shocks, including international wars and indigenous unrests in the late Qing China, this article highlights the role of the Taiping Rebellion (1851-1864) (太平天国运动) in the profound fiscal transitions of the Qing Empire. For over a decade the Taiping rebellious regime disturbed the prosperous Middle and Lower Yangzi provinces and its expeditionary forces spread across inland China. This rebellious regime was the greatest threat to the Qing reign which led to significant population loss and agricultural depression, since when the image of a self-sufficient giant empire began to fade (Wakeman, 1975; Cao, 2001; Kuhn, 2002).

I argue in this article that the Taiping Rebellion triggered the decline of land taxation and the rise of local indirect taxation, intertwined with pervasive and persistent military and administrative decentralization. To suppress the rebels, the Qing central state, with a vulnerable tax base and weak imperial army, acquiesced the establishment of local militias (Luo, 1939; Kuhn, 1980). To finance the militias, the local governments bypassed the centralized land taxation system and introduced a novel commercial tax (lijin / likin, 厘金). This was the first time for the Chinese state to institutionalize autonomous commercial taxation at the local level in the long Ming-Qing history (1368-1911).[2] During the post-Rebellion decades, the self-serving local lijin institutions persisted

[2] However, the earlier Song Dynasty (960-1279) never ignored the commercial sectors. Hence Iwai (2004) held no doubt about the setbacks of the Ming-Qing public finance. The prominent Song Empire had an innovative fiscal

and provided indispensable fiscal resources for local spending out of the central control. To sum up, rapid growth and resilient persistence of indirect taxation, the lijin, was linked to the Taiping warfare as an exogenous shock, and it remarked the initial endeavours of the local political powers in the making of a more responsive and sustainable fiscal system. The middle 19th century was an era of chaos, uncertainty, and decentralization, but it was such an era that triggered one of the most profound fiscal institutional transitions in modern Chinese history.

This narrative is documented in qualitative surveys (Wang, 1927; Bill, 1958; He, 1972, 1981; Zhou, 2006, 2008) while no quantitative breakthroughs at the micro level have been made. In this article I employ primary resources and code the Taiping warfare and the lijin taxation with different measures for 266 prefectures across the Qing China Proper. With the original dataset I firstly examine the randomness of the Taiping military behaviours at the prefectural level, and then use OLS regressions to verify the link from the Taiping warfare to the lijin taxation. I find a positive and significant effect of the Taiping warfare on the lijin taxation at the prefectural level, and the results are robust no matter how I change measures or add controls. The magnitude of this effect is considerable. In a baseline regression, large-scale battles between the Taiping and the Qing powers for extra three months would bring 0.9 new lijin stations for a prefecture (mean = 2.801). This is a huge impact compared with other shocks of the same era: a 12-year treaty port, forcefully opened by the Westerners, would make the same contribution on the scale of local lijin taxation as extra three-month battles would do.

I provide other robustness checks to demonstrate that international wars and natural disasters could not explain the rise of the lijin. Furthermore, I discuss the two-phase development – 'expansion' and 'persistence' – of the lijin taxation during the decades and conclude that an early introduction of the lijin due to warfare led to higher level of the lijin taxation even after the Rebellion. I also examine how the shrinking of land taxation, as a crucial channel, played a role in inducing the lijin and how the lijin effectively mitigated the local fiscal burden. Finally, I present

system, including its dependence on indirect taxes, the unified monetary system, the meritocracy-oriented taxation bureaucracy, and the sprouts of credit instruments with government promotions and involvements (Liu, 2015). However, the invasion of the Mongols and their reign (1271-1368) destroyed the Song achievements and the later Ming Empire (1368-1644) rolled back to a static and rigid agrarian mode.

evidence on how the lijin was spent at the local level and draw implications on how the lijin strengthened the local economic autonomy and political self-determination. The quantitative evidence from the Self-Strengthening Movement (1860s-1890s) and the 1908 Provincial Parliament Elections implies a positive role of the lijin in this process.

This article provides fresh perspectives for our understanding of political disorder and fiscal capacity on a global scope, and it speaks to several strands of the literature. First, existing literature has recognized the positive role of international wars (Brewer, 1988; North and Weingast, 1989; Tilly, 1990; Epstein, 2002; Besley and Persson, 2011; Gennaioli and Voth, 2015), but the role of internal insurrections – civil wars or rebellions – is in a debate. Besley and Persson (2008) propose a negative role and Cárdenas et al. (2014) provide Colombia's evidence; however, Rodríguez-Franco (2016) considers the stance of local elites and constructs a framework to show how internal conflicts foster taxation, which is also supported by Slater (2010) and Ch et al. (2018). This article offers an influential Chinese historical case, the Taiping Rebellion, to show how an internal shock was conducive to fiscal institutional changes in a positive sense. Given the Qing China's giant size with a unified political regime and cultural background, 266 prefectures could provide meaningful variation in the severity of the Taiping warfare and make it possible for us to investigate the consequential fiscal outcomes.

Second, the literature proposes that indirect taxation played a role in early modern times but since the 20th century direct taxation has been increasingly important (North and Weingast, 1989; Besley and Persson, 2013). However, for the late imperial China with the 'mandate of heaven' (Brandt et al., 2014) as the legitimacy, the merits of indirect taxation were more meaningful because it incurred less tax resistance and was less costly while more responsive to the local economic conditions. Therefore, this article suggests that the merits of direct and indirect taxation are highly contingent, and we should rethink over the legitimacy of a regime first (Gardner, 2012).[3]

[3] Bernhardt (1992), Yang (2012) and Zhou (2019) contribute greatly to the research on post-Taiping fiscal changes of China from the perspective of direct taxation (overwhelmingly land taxation).

Third, this article revisits the central-local relation issues in a broader context. Recent fiscal capacity literature emphasizes the importance of power centralization and common taxation in the process of fiscal modernization (Epstein, 2002; Drelichman and Voth, 2008; Dincecco, 2009; He, 2013). This claim is also contingent. For a giant empire like the Qing China, centralization was not necessarily linked to the effectiveness of the fiscal regime. In fact, during the two centuries before the Rebellion, the Qing Empire established a sophisticated hierarchical bureaucracy and the fiscal regime was strongly universal and centralized (Wang, 1973). However, centralization in the Qing Chinese context led to severe principle-agent problems (Sng, 2014), but decentralization and the consequential local autonomy, by contrast, strengthened accountability, enhanced fiscal and military capacities and guaranteed the social order at the local level during the mid-19th century.[4] This case inspires us to think of the trade-off between centralization and decentralization, a long-lasting debated topic of historical and contemporary Chinese studies (Xu, 2011; Brandt et al, 2014; Zhou, 2017).

Finally, this article speaks to the literature discussing the trajectory of modern Chinese history. Fairbank (1980) as a key figure highlighted the role of the Westerners in China's political and economic modernization and interpreted the repertoires of institutional transitions in China merely as responses to the Western shocks, and there is micro-level evidence from this view (Jia, 2014). However, this article suggests that the indigenous shocks were, if not more, equally important, since the Qing China had its inherent political and economic equilibrium with great inertia (Cohen, 1984; Deng, 1999; Motono, 2000). This article adds micro-level evidence to this debate from the angle of fiscal transitions.

The rest of this article proceeds as follows. Section 2 provides relevant historical backgrounds: the rise and fall of the Taiping Rebellion, the fiscal crisis of the Qing state and the rise and persistence of the lijin taxation. It also introduces how I construct the dataset for the Taiping warfare and the lijin taxation. Section 3 outlines the empirical strategies, gives the results of baseline regressions

[4] The lijin practices in the Late Qing China were not unique in global history. Middleton (2005), Spaulding (2011) and Johnson and Koyama (2017) documented in detail the tolls along the River Rhine, which became prevalent after 1648. The institutional setting was quite alike as the principalities and powers along the Rhine set toll stations and taxed on the goods in transit. After the French Revolution such practices declined (Acemoglu et al., 2011).

and launches robustness checks. Section 4 discusses the relevant mechanisms including the institutional spillover of the lijin, the decline of land taxation and the political and economic consequences of the lijin taxation. Section 5 provides concluding remarks.

2. Historical Overview and Data Description

2.1. The Taiping Rebellion

A Chronology

After repeated failures in the Civil Service Examinations, Hong Xiuquan, the founder of the rebellious regime, created an indigenous religious organization, the God Worship Society in 1843, and attempted to reconcile Christian doctrines and traditional Chinese secret religions (Spence, 1996). Within several years the Society absorbed numerous peasants, and military camps were established in the mountainous middle Guangxi region.[5] In January 1851 Hong declared his opposition to the Qing rule in Jintian and the rebels spread quickly and marched towards Hunan Province in May 1852 (CMH, 2003). During the second half of 1852 the rebels blitzed and plundered Hunan in a random route and moved northbound without any effective resistance from the Qing imperial troops (Luo, 1939). In January 1853 after months of intense battles, the Taiping troops occupied several transportation hubs in the Middle Yangzi region (CMH, 2003). They sailed down the Yangzi River and fiercely attacked the downstream ports: Jiujiang and Anqing fell in February, and so did Jiangning[6] in March, which was set as the capital city of the nascent Taiping regime (FHAC, 1996).

During the next decade the Taiping leadership made arduous efforts in governing the Middle and Lower Yangzi regions but power balance between the Taiping and the Qing was constantly shifting. It launched seven long-distance marches to control more land and extract labour, grains and

[5] In Guangxi the resource conflicts between the Hakka immigrants and the local powers were intense in the 19th century. Hong, as a Hakka immigrant, gained wide support from his ethnic group and the Society rapidly became strong and popular (Wakeman, 1975; Platt, 2012). Meanwhile Platt (2012) proposed that the local plague in 1850 won Hong with greater mass support since the patients believed that the Society would heal them.

[6] Jiangning (江宁) was the name of the prefecture, where today's Nanjing (南京, Southern Capital) is located. Sometimes it was referred to as Jinling (金陵). Its Taiping name was Tianjing (天京, Heavenly Capital). In this article I will use the prefecture's name Jiangning.

properties. Tens of thousands of Taiping soldiers were sent to the front line. Due to their anti-Confucian doctrines and intense plunders, they brought widespread panic and unrest to both inland and coastal China. From 1862 the Qing powers began to take hold and regained most plundered prefectures (TSU, 2013). In the Taiping capital area, ruthless battles lasted for 27 months until the Taiping's fall in July 1864 (Guo, 1989). Sporadic guerillas fled to the coastal Fujian and Guangdong, but all rebels were wiped out within two years by the Qing state (FHAC, 1996).

The Impact of the Taiping Rebellion on the Qing State and Society

The Taiping Rebellion was the greatest threat to the Qing reign (Ho, 1959; Wakeman, 1975; Spence, 1996). It reshaped the Qing political and socioeconomic nature in several ways. Firstly, the Rebellion permanently reversed the central-local relations of the Qing Empire, and the local powers became the dominant players in the Late Qing political repertoires. When the Taipings were raging over southern China,[7] the desperate Qing central state turned to a forced power decentralization. Provincial governors and local gentry were granted with the greatest autonomy of setting up militias and building fortifications (Kuhn, 1980).[8] Meanwhile, as the Civil Service Examinations were suspended in the war zones, powerful governors hired think tanks and appointed officials, through which they built up personal networks and weakened the central authority (Luo, 2007). The Taiping Rebellion accelerated the collapse of the traditional centralized administrative system, and decentralization persisted for decades even after the rebels were wiped out in the late 1860s. Lack of central authority with the acquiesced self-determination of local defensive actions is a key condition to understand the political and fiscal changes by the Rebellion at the local level.

[7] The Qing central government was unable to cope with such large-scale chaos because its military and administrative systems were strictly hierarchical and the decision-making process was highly centralized. The formal troops received commands from the center and fought independently. The autonomous coordination among provinces was minimal, and a local troop had no incentive to cross the provincial border even if it could eliminate the rebels (Wakeman, 1975; Kuhn, 1980).

[8] This was not the first time for the Qing state to organize militias to fight against insurrections: they did so in 1796 at the outbreak of the White Lotus Rebellion. However, the 1796 Rebellion was not as devastating as the Taiping one, and the Qing state took the military power back when the White Lotus powers were eliminated. In the 1850s the local powers re-employed their earlier expertise of training militias but for this time the autonomy was never returned to the center.

Secondly, the direct economic impact of the Taiping Rebellion was pervasive and devastating. Millions died of the armed conflicts, massacres, and famines.[9] In Anqing as an example, fierce battles lasted 18 months and both sides invested over 100,000 soldiers, ending up with the Qing victory and a massacre to its enemies (Platt, 2012). In the Taiping capital area from 1856 to 1860 the Taiping troops destroyed two major Qing camps near the Yangzi River, each for twice; during the battles the Qing side suffered over 10,000 casualties. The final siege and anti-siege over the capital lasted for two years while each side sent more than 100,000 soldiers (FHAC, 1996). Great loss of population led to insufficient labour inputs and a sharp decline of primary sector. Meanwhile, the Taiping regime greatly disturbed the long-distance transport networks, especially the Yangzi River and the Great Canal, which severely challenged the rigid and hierarchical grain and salt transport system. After 1852 most southern cities were under the shadow of the Taipings who seriously undermined the Qing market integration (Ni, 2017). Economic shocks by the Rebellion, especially the agricultural recession and the setback of long-distance transport, lay foundations for the fiscal transitions.

Finally, the Taiping regime per se was destructive due to its short sight. Within its territory, the taxation, land redistribution and official recruitment were highly coercive and unsustainable due to its intense military activities. The Taiping fiscal sources consisted of confiscation, forced 'donations' (捐) by mass people, and taxation (Mi, 1983). The Taiping regime generated very limited revenue and no reliable estimations can be made from archives. In short, its destructive and one-off extraction further impeded economic growth while available resources were invested in its military actions.

Quantifying the Taiping Impact at the Prefectural Level

The Taiping Rebellion was not alone; the 19th century witnessed the withering of the Qing state as the low-cost political system with a small bureaucracy retreated from many public affairs (Deng, 2012). Rebels took actions in a spontaneous, simultaneous, independent and disordered way, arising from the nomadic Manchuria and the north-western China to the peripheral southwestern

[9] The estimations of population loss from the Taiping Rebellion vary on a wide range – 100 million by Ho (1959), 73.3 by Cao (2001) and 46.9 to 95.1 by Li and Lin (2015).

hinterlands. Figure A.7 maps the spatial distribution for them. Among them however the Taiping Rebellion was distinctive among all others of the same era. Spatially the Taipings impacted all nine 'macroregional' systems[10] while others covered three at most; temporally the Taiping Rebellion lasted for a rather long time. Hence its nationwide impact was well recognized. However, the Taiping troops impacted on prefectures in various ways, but the significant spatial variation is greatly under-explored. This article investigates primary resources and quantifies the Taiping impact at the prefectural level.

The main data sources for this article are Guo (1989) and FHAC (1996). Guo's (1989) atlas records the geographical information on the Taiping military actions from 1850 to 1866, and FHAC (1996) compiles the Qing official records – edicts and memorials – about the suppression of the Rebellion, from which I infer the severity of each armed conflict.[11] Appendix A provides an example of how a recorded Taiping action is located and quantified. Through sorting and locating all Taiping military actions for over a decade, this article measures in four ways the Taiping impact on 266 prefectures in all 18 provinces of China Proper: a dummy, a dummy that only considers large battles, a duration that counts the number of months in war, and a severity score that incorporates all disturbances and weighs their importance. Table 1 and Figure 1 provide a summary of the calculating methods and visualization on a national scale, respectively. Descriptive statistics are in Table A.4. Compared with the measures in previous studies, these four measures consider temporal and spatial changes for 266 prefectures thoroughly and quantify the Taiping impact in a more comprehensive way as every single battle, with its duration and severity, is tracked.

2.2. The Rise of Indirect Taxation and Its Persistence

The Fiscal Crisis of the Qing Empire

A fiscal crisis for the Qing Empire became evident since 1851 from both revenue and expenditure sides. Regarding revenue, all three major tax sources shrunk because of warfare. The large-scale

[10] Skinner (1985) divided China Proper (Manchuria not included) into nine relatively self-sufficient economic systems which had their own economic cores with most economic activities confined within. They are Northwest, North, Upper Yangzi, Middle Yangzi, Gan Yangzi, Lower Yangzi, Yungui, Lingnan and Southeast Coast.

[11] Meanwhile I use Yi and Zhu (1896/1965), Zhang (1984), Hua (1991), CMH (2003) and TSU (2013) for a cross check.

chaos brought great uncertainty to agricultural production in the warzone and severely restricted the scale of land taxation. Domestic customs tax and salt tax systems were also disrupted due to the halt of long-distance trade and the decline of licensed salt production (Chen, 1997). Meanwhile the warfare broke down the remittance system and greatly undermined the coordinating capacity of the central state.[12] Figure 2 outlines the pre-Rebellion fiscal revenue structure and indicates how the financial constraint arose instantly since the outbreak of the Taiping Rebellion. For the 1840s the Qing state had collected 35 million silver taels annually. Land tax had accounted for over 60% (Wang, 1973); however, during the Rebellion annual land tax revenue was nearly halved. Salt tax revenue had accounted for 13% and it almost diminished in the late 1850s. Customs taxation, another 16%, was less impacted: although the levies on domestic long-distance trade declined, international trade backed up. In short, in the middle 1850s, the annual fiscal shortage of the Qing state was approximately 15 million taels – 45% of its pre-war annual revenue.

Meanwhile, the Taiping Rebellion transformed the Qing expenditure structure significantly. For the previous peacetime, annual government expenditure had been 31 to 38 million silver taels, over 70% to be military spending and government official salaries (Chen, 2010). Since the 1850s temporary military spending took a rapidly growing share. I take the number from the ex post official memorials: the 14-year suppression cost the Qing government 171 million silver taels (Peng, 1981; Tang and Liu, 1987). Ceteris paribus the annual extra-budget military expenditure reached 12 million taels.

For the decades before the Rebellion the Qing public finance was simple, static and rigid. Tax sources were limited but stable, and the expenditure was always restrained on a moderate level to make ends meet; the silver reserve at the Board of Revenue was at a low level,[13] summarized by Iwai (2004) as 'quotaism' (原额主义). However, this system was vulnerable when facing unexpected shocks. The Taiping Rebellion unprecedentedly brought an annual fiscal shortage of

[12] For example, in 1852 the Guangxi Governor complained about the slow and insufficient intergovernmental transfers (FHAC, 1996; Ni, 2017). Another challenge was the unapproved local retainment of the tax revenues. During the peace time provinces had had to transfer most tax revenues to the center (Wang, 1973). However, the records in June 1853 indicated that provinces under warfare started retaining various revenues for military use, while the coordination from the center became absent (FHAC, 1996).

[13] At the outbreak of the Rebellion the silver reserve was fewer than 3 million taels (Shi, 2009).

26 million silver taels according to above estimation, which suddenly worsened the balance sheet and pushed the Qing public finance into an irreversible crisis. In 1853 the central state promulgated several urgent edicts to push all its organs to 'take prompt actions to raise funds regardless of means' (无论何款，迅速筹备) (Chen, 1997) but the top-down ways were all a cliché. Imperial title sales[14] had been the most frequently applied method to cover the deficit but it was one-off as an individual only paid once in lifetime. In the pre-Rebellion decades, the Qing state had sold vacancies too frequently – almost every two years from 1821 to 1849 – and exhausted the demand of the masses (Ni, 2013); furthermore, the increasing number of sales diluted the value of degrees and positions and made them less attractive. Hence this solution was abandoned after 1853. Another major solution by the central state was to issue the 'big cash' (大钱) by the debasement of copper coins and issuance of paper notes, which immediately received negative responses from the financial market.[15] All 'big cash' was soon depreciated to its original value and through the decade the Qing state failed to make any profits.

The Bottom-up Emergence of Indirect Taxation 'Lijin' and Its Feasibility

The workable solution was introduced by local officials. In March 1854, a memorial from Lei Yixian, the handler of Yangzhou military affairs (帮办扬州军务) and assistant minister of the Board of Penalty (刑部侍郎), caught the attention of the central government, in which he argued how he established an indirect taxation system in Yangzhou, a stressful prefecture under the shadow of the Taiping regime. In the summer of 1853 Lei's army was in a financial crisis as the warfare became intense. Without notifying his superior, in August he focused on the grain sector in the towns along the Lixia River and levied grain stores the 'lijin' (厘金), 1% of transaction amount (FHAC, 1996).[16] This alternative immediately mitigated Lei's financial crisis and he promoted this system along the north bank of the Yangzi River by setting lijin stations at the

[14] Passing the Civil Service Exams were the only opportunity of upward social mobility for the mass commoners, and successful gentries with a degree or official title were exempted from land taxation and criminal penalty (Chang, 1955). The imperial title sales provided an attractive shortcut (Xu, 1950).

[15] The Qing state did not tie paper notes to the silver reserves due to the lack of financial knowledge, and the newly minted copper coins had far less intrinsic value than their face value (He, 2013). The public trust was destroyed at the moment of their issuance (Peng, 1983). Private workshops minted the 'big cash' by melting the original ones; pawnshops and private banks were closed; capital fled, and price level experienced a five-fold jump in the capital city (Ni, 2017).

[16] For the name 'lijin' and its historical ambiguity in Chinese, see Zhou (2006).

transport nexuses and adopting it to other sectors. In November 1854 Lei persuaded his superior Shengbao, imperial envoy (钦差大臣), cabinet member (内阁大学士) and minister of the Board of Rites (礼部尚书), to send memorials to the Emperor Xianfeng. Those memorials changed the original rigid, static and centralized fiscal regime and gained legitimacy for the lijin institutions at all local levels. This sudden but profound breakthrough witnessed the first time for the comprehensive indirect taxation to be acquiesced by the Qing state during its two-century rule. Within several years all 18 provinces established their own lijin institutions.[17] Figure 4 outlines how the lijin institutions spread nationwide, and Figure 2 illustrates how the considerable lijin revenue made up for the extra-budget needs since 1853. At the end of the Rebellion the lijin revenue reached an annual level of 18 million silver taels – 70% of the annual fiscal shortage.

The pervasive introduction of the lijin is a crucial step for the Qing state to strengthen its fiscal capacity. There was indirect taxation in the pre-Rebellion era, but as a regime for 'maintenance rather than maximal efficiency' (Strauss, 1998), taxes on commercial activities were extremely light. Previous customs tax, as a central tax, had taken a share of 16% in total fiscal revenue, and if we exclude international customs tax, the domestic part became minimal. There were about 50 domestic customs (常关) to tax on domestic goods in a giant empire with over 400 million people. Domestic customs taxed on long-distance trade, while the short-distance trade was neglected by the central state.[18] Figure A.8 shows the uneven distribution of domestic customs – even for some provincial capitals the nearest customs were over 300 kilometres away. Therefore, although the early Qing times (1640s-1840s) witnessed explosive population boom and impressive Smithian growth (Von Glahn, 2016), the incremental part of the national economy, especially secondary and tertiary sectors, was out of the scope of the Qing regime. The Taiping Rebellion was an unexpected shock that led to such a transition: faced with severe local fiscal constraints, local officials

[17] The lijin practices became flexible when introduced to other provinces. In a few provinces the lijin was a levy on stationary producers and traders, but on a national scale the transit lijin (通过地厘金) was a major form: the local governments set stations at the market hubs, gateways of towns, and nexuses of roads and waterways and mainly levied on goods in transit.

[18] There had been miscellaneous taxes targeting at merchants such as brokerage tax and pawnshop tax. However, they had accounted for less than 10%, and we have a limited knowledge of them as tax farming had been popular (Luo, 1936). Furthermore, from the 1800s to 1840s several prestigious officials including Zeng Guofan and Lin Zexu proposed the merits of indirect taxation, but no changes were made by the throne (Luo, 1936). For the rationale of the Qing central state and the reluctance to changes, see Ma and Rubin (2019).

reasonably turned to the under-taxed short-distance trade for alternative incomes. For them this was a safe solution because three major traditional tax sources, owned by the central state, remained intact while the lijin system cultivated an independent but more lucrative field at a local level.

Meanwhile, the nature of the warfare made it workable. The Taiping regime never established a closed border, and its expansion strategies were highly contingent; Appendix B provides a survey. The Taiping-ruled cities and towns were weakly linked by roads and waterways, while they had no effective control over the vast rural society where the local commerce persisted (Spence, 1996). Cities and towns per se provided limited labour, grains and weapons, while rural China contained a great number of scattered but self-sustained economic systems (Skinner, 1977). Hence the local Qing officials were able to utilize the available resource – levies on the flexible short-distance trade – to enhance their fiscal and military capacities continuously under the Taiping shadow.

The Persistence of Local Indirect Taxation after the Rebellion

The lijin taxation was so profitable that after the Rebellion it was preserved by local officials at all levels while the central and local fiscal conflicts were increasingly evident. During the post-Rebellion decades (1870s-1910s) the Qing central state took various measures to consolidate its control over the lijin but all ended up in failures due to the strong local resistance. The local lijin institutions became permanent in the name of 'post-war recovery and local defense' (Rowe, 1992). The persistence of indirect taxation reshaped the structure of the Qing fiscal revenue and Figure 2 provides an overview. Although land and salt taxation recovered, the fiscal revenue structure in the last decades of the 19th century showed a sharp contrast to the 1840s' one. Salt tax was stable; customs tax and miscellaneous taxes experienced moderate growth in volume; the proportion of land tax revenue fell from approximately 60% in the 1840s to 40% in the 1890s – they were all central taxes. By contrast, the lijin since its emergence played an increasingly important role: it took a stable share of approximately 20% in the 1890, and this number was zero in 1852. Furthermore, the overall annual fiscal revenue, central and local in total, doubled by reaching 80 million silver taels in the 1890s. Regarding the incremental part, the autonomous and independent local lijin taxation made significant contributions.

The lijin system persisted at the local level for eight decades – even after the Qing Empire's fall – because of its incentive structure and accountability. Firstly, the lijin institutions were self-serving, with great autonomy to set stations, hire employees and adjust tax rates. Central supervision was absent while the powerful local incentives brought unexpectedly high efficiency and flexibility. The personnel management was independent: the bureaus and stations bypassed the Civil Service Examinations and hired employees without degrees (Chen, 2015). Official collection instead of tax farming dominated (Luo, 1936) to prevent involution (Duara, 1991). Regarding operational cost, most provinces used less than 10% of the tax revenue to run the system, which was much more cost-saving than running the regular bureaucracy (Chen, 2010). During the 1880s each Middle Yangzi province (Jiangxi, Hunan and Hubei) spent about 110,000 taels to run the lijin apparatus annually, which could pay for salaries of only six high-ranked central officials like Zeng Guofan (Zelin, 1984).

Secondly, compared with direct taxation and monopoly sales – the Qing central tax sources, indirect taxation was more responsive to local economy and more legitimate. The 'mandate of heaven' (Brandt et al., 2014) was the orthodox legitimacy, and there had been no political enlightenment of 'no taxation without representation'; tax resistance was always one of the greatest threats to the Qing reign (Wong, 1997). For the 19th-century China with an agrarian economy and a small bureaucracy, direct taxation limited its fiscal capacity due to low flexibility, limited growth potential and high costs of statistics and operations. By contrast, indirect taxation on transported goods had greater growth potential and much lower costs. More importantly it matched the local military needs and mitigated the risk of tax resistance by the mass people.[19]

[19] Lei's memorial (FHAC, 1996) exhibited surprisingly progressive economic thoughts on indirect taxation. Firstly, he argued that indirect taxation was 'steady and permanent' (细水长流，源远不竭). 'The title purchase revenue from rich households was limited while commercial goods transport was infinite.' (富家之捐输有尽，而商贾之转运无穷) Secondly, the lijin revenue was more flexible and responsive. 'Fewer profits (for a merchant) meant fewer taxes while more meant more taxes. The amount of lijin was totally determined by the transaction amount.' (入少则捐少，入多则捐多，均视其买卖所入为断) Thirdly, there was a pulling effect as the levied merchants transferred the burden to customers. 'Although we urged the merchants to pay, the taxes came from the customers… so that we levied on the mass people in an invisible way without resistance.' (况名为行铺捐厘，其实仍出自买客……所谓征于无形而民不觉者也). Finally, since the lijin was for suppressing the Rebellion, the obligation was widely recognized by taxpayers. 'Gentries and mass people valued the security of their properties, and the suppression of the Rebellion was closely related to everyone's welfare. This made the lijin taxation smooth.' (绅民身家念重，痛痒相关，故臣之劝捐，视各处较易)

Quantifying the Lijin Taxation at the Prefectural Level

I map the rise and persistence of the lijin taxation at the prefectural level with primary resources. Unlike most Qing fiscal records well kept at the central level, the lijin records are inconsistent and incomplete as local governments were unwilling to disclose their performances. Information asymmetry brings difficulty to this article.

This article tries to make a breakthrough by investigating the information revealed by *the Financial Reports* (《财政说明书》) published from 1908 to 1911. In the last three years of the Qing Dynasty, the new Board of Finance launched a series of fiscal reorganization campaign as part of the Constitutional Reform. Ad hoc Bureaus of Fiscal Reorganization undertook unprecedentedly detailed surveys in provinces to uncover the black box of local public finance. Their output, *the Financial Reports*, compiled by BL (2006) and Chen (2015), revealed various information on the Late Qing local public finance including the lijin operations. I will also use information in Luo (1936). There are two main challenges when I utilize the materials. Firstly, it is hard to establish a yearly prefectural panel dataset because *the Financial Reports* only reflected the situation in 1908. Secondly, very few provinces recorded annual prefectural lijin revenue data.[20]

For the first challenge, I will make most of *the Financial Reports* and establish a cross-sectional dataset. Figure 2 exhibits the yearly amount of national lijin revenue and implies that the lijin persisted well from the 1860s to the 1900s, so that my cross-sectional dataset, although built with the 1900s information, will reflect a reliable and consistent image of the lijin operations across China. For the second challenge – lack of revenue data – I count and locate the lijin bureaus and stations nationwide, the details of which were fortunately well recorded in *the Financial Reports*. The number of bureaus and stations is a reasonable measure of the local lijin taxation scale, for two reasons. First, the local lijin institutions were spontaneous and independent, without any planning or intervention from the throne or the Board of Revenue. Second, since the lijin was a levy on goods in transit, the geographical distribution of bureaus and stations must be rational. They needed to capture the flows of goods. Workloads of bureaus and stations must be comparable –

[20] Among 18 provinces in China Proper, only three, Jiangsu, Zhejiang and Shaanxi had cross sectional records on the prefectural annual lijin revenue for a certain year of the 1900s.

those with light workloads might be abolished while a busy one would be split into two new ones. Table A.3 verifies the comparability of the sizes of the lijin stations among and within provinces by reviewing existing records.

I establish a cross-sectional dataset for 266 prefectures, and for each I obtain the numbers of provincial bureaus, main stations and additional stations.[21] Figure 3 provides visualization on a national scale in density (weighted by land size). A province owned one to three provincial bureaus, which mainly took managerial responsibilities so that their sizes were not significantly larger than its subordinates and there was no siphon effect on the lower level. Under provincial bureaus there were main stations, the major touchpoints for taxpayers. Besides, since some regions had complex geographical conditions there were additional stations under certain main stations. The numbers of additional stations varied significantly among and within provinces, and four provinces lacked relevant records. Therefore, I will mainly employ the density of main stations as the key dependent variable.

Furthermore, I construct two alternative measures of prefectural lijin taxation for robustness checks. The first considers estimating the number of the lijin employees in a prefecture. With the numbers in Table A.3 I assume that each provincial bureau had 30 employees and each main station, with a certain number of additional ones, had 35 employees in the south-eastern coastal provinces and 18 in the remaining provinces.[22] The second alternative measures annual lijin revenue for a prefecture. From Zhou (2011) I obtain the average annual lijin revenue for each province from 1890 to 1899 as the data are complete. Within a province I assume that the workload for each employee was similar, and then the prefectural annual lijin revenue should be proportional to the number of employees in this prefecture. Table 1 summarizes the calculating methods of all mentioned measures.

[21] Different names like 'bureau'(局), 'station' (厂) and 'checkpoint' (卡), were used in different provinces. For simplicity, this article only uses the names 'provincial bureau', 'main station' and 'additional station'.

[22] I do not use the information on additional stations as four provinces lacked relevant records. I assume that additional stations were surrounding a main one in cluster, and my estimation for the main stations' number of employees, 35 or 18, has already considered the clustered additional ones. The variation within and among provinces is reliable, and the estimated national number of lijin employees, 21206, is consistent with Luo (1936).

Finally, *the Financial Reports* highlight the starting year for a prefecture to introduce lijin so I establish a rough panel dataset for prefectures with the lijin taxation in dummy, and Figure 4 exhibits how the lijin spread in decades at the prefectural level. This process can be clearly divided into two phases, expansion and persistence. In the first phase (1853-1864), its rapid and steady growth was facilitated by the fiscal need to suppress the Taipings. During this decade 147 prefectures introduced the lijin, accounting for 70% of total number of prefectures with the lijin. In the second phase (1865-1900s), the lijin institutions showed a great ratchet effect. Institutions continued spreading but in a fine-tuning way. This is consistent with Figure 2: in the 'expansion' phase, the annual national lijin revenue increased from 0.4 to 17.6 million silver taels, with an annual growth rate of 46%; in the 'persistence' phase, this number maintained the level of 18 to 20 million with very minor volatility. This evidence makes my cross-sectional dataset plausible.

Motivational Evidence

This part provides some motivational evidence about the link between the Taiping Rebellion and the lijin taxation. Figure A.9 employs the yearly provincial panel data for the lijin revenue (Zhou, 2011) and presents the temporal pattern of the selected provinces, four severely impacted in the Middle and Lower Yangzi region and four lightly impacted in the north. The dichotomy is suggestive, but the gap between two groups is striking for both overall and per capita levels. More importantly, the divergence arose in not the 'persistence' but the 'expansion' phase. Due to the intense Taiping warfare, the severely impacted provinces had much higher growth rates of the lijin revenue during the Rebellion and the high level persisted for decades; for the northern provinces, no clear two-phase pattern can be seen.

Besides, Figure A.10 employs the cross-sectional data and plots the lijin taxation to the Taiping impact at the prefectural level. It uses different measures for both lijin taxation and Taiping impact, and the positive correlation on a national scale always holds.

3. Empirical Strategies and Main Results

3.1. Baseline Regressions

In this part I use cross-sectional data for 266 prefectures to study the impact of the Taiping Rebellion on the lijin taxation. The specification is

$$Lijin_i = \beta_0 + \beta_1 Taiping_i + \boldsymbol{W}'_i \boldsymbol{\beta} + \varepsilon_i$$

where i denotes prefectures. I use several measures introduced in Table 1 for dependent and key independent variables, $Lijin_i$ and $Taiping_i$ respectively. $\boldsymbol{W}'_i$ consists of several sets of control variables that may affect the lijin taxation. First, the initial geographical conditions including access to the coast, the Yangzi River and the Great Canal, the log of land size, and the latitude. Second, the initial political and economic conditions predetermined before 1850, including the log of population in 1820, and the distances to the nearest provincial capital and domestic customs. Third, other post-1850 disturbances which might shape the local lijin institutions such as the duration of foreign treaty ports and dummies for other rebellions of the same era. Calculating methods for control variables are in Table 2, and Table A.4 presents descriptive statistics. ε_i denotes the error term. For all regressions the standard error is robust and clustered at the provincial level. β_1 is the coefficient of our interest and I expect it to be positively significant.

This article mainly uses OLS regressions to verify the impact of the Rebellion on the lijin, and the exogeneity of the Taiping military behaviours to the local economic conditions is an underlying assumption. Appendix B provides several qualitative narratives on the randomness of the Taiping marching routes. Meanwhile, with the established prefectural dataset I regresses the different measures of the Taiping impact to the pre-Rebellion geographical, political and economic conditions and finds that no such factors are consistently significant. Furthermore, I count the monthly battles between the Taiping and the Qing during 1853 and 1864 and construct count variables such as *Taiping Duration (Jan.1853-Dec.1854)*, *Taiping Duration (Jan.1855-Dec.1856)*, etc. for each prefecture; then I use Poisson regressions to check whether locations of the earlier Taiping battles could predict the ones in years later and find that the prediction power is extremely weak. Results in Appendix B support the exogeneity of the Taiping Rebellion.

Regarding the key specification, the baseline regression results are shown in Table 3. I use the density of main lijin stations as the dependent variable and four measures of the Taiping impact as key independent variable. Columns 1 to 4 are the results without controls. Columns 5 to 8 add the control variables for initial geographical conditions and pre-Rebellion political and economic factors. Columns 9 to 12 add further controls for other post-1850s shocks that might push or hamper the indirect taxation. All columns give significant coefficients for the Taiping impact no matter which measure I use, and the key coefficients become smaller when I add more controls.

With the fitted models I estimate the marginal effect of the Taiping Rebellion on the lijin taxation. In Column 12 of Table 3 for example, the coefficient for *Taiping Severity* is 0.239: if there were large-scale battles between the Taiping and the Qing powers for extra three months, the density of main lijin stations would increase by 0.072 (0.239*3*100/1000); considering the median prefectural land size to be 12,140 km^2, such extra warfare would bring about 0.9 new main stations. This is considerable: Table A.4 implies that about half of the prefectures in my sample had no more than two main lijin stations.[23] I take control variables for a comparison. In the same column, the coefficient for *Treaty Port Duration* is 0.006, significant at 1% level: if there was a treaty port for 12 years, the density of the main stations would increase by 0.126 exactly. Therefore a 12-year treaty port and 3-month intense Taiping warfare would make the same contribution on the local lijin taxation.

Besides, we should notice in Columns 5 to 12 that some initial conditions always played a strikingly strong role: if a prefecture was by the Yangzi River or the Great Canal, the density of the main stations would increase by at least 0.156, which means 1.89 new main stations – a huge effect given the median among prefectures was two main stations.

3.2. Robustness Checks

As a robustness check I replace the density of main stations and consider the weighted number of the lijin employees or annual revenue to examine whether the Taiping impact is significant.

[23] Put it another way: a one-standard-deviation increase in the *Taiping Severity* indicates a 0.057 increase for the density of main lijin stations (mean = 0.261).

These are still OLS regressions at the prefectural level. Results are given in Table 4 and I only present regressions with *Taiping Severity* as the independent variable.[24] Columns 1 and 3 do not include controls and Columns 3 and 4 do. All key coefficients are significant and those with controls are smaller.[25] Similarly I can estimate similar marginal effects from Columns 2 and 4 of Table 4. In Column 2, the coefficient of *Taiping Severity* is 9.924, and extra 3-month battles would increase the weighted amount of the lijin staff by 2.977; considering the median land size of a prefecture, there would be 36 new lijin employees – approximately the number of employees for one main station. In Column 4, the coefficient of *Taiping Severity* is 16.350, and extra 3-month battles would increase the weighted annual lijin revenue by 4.905, which meant an extra revenue of 60,000 silver taels per year. This can be a considerable independent revenue for a prefecture. The land tax dataset (Liang, 1980) implies that the average prefectural land tax revenue in 1820 on a national scale was 186,000 taels, and even in the richest Lower Yangzi region, the provincial capitals Jiangning and Hangzhou collected only 556,000 and 708,000 taels respectively. Hence the lijin taxation provided a stable and considerable revenue for local fiscal budget which went completely out of the central control.

Furthermore, I am concerned about whether other historical changes instead of the Taiping Rebellion triggered the rise of the lijin, and regressions in Table 5 use those changes to predict the density of main lijin stations.[26] Since the 1850s the reign of the Qing Empire was threatened by its defeats in several international wars, resulting in the forced opening of treaty ports and huge amounts of indemnities (Fairbank, 1980). During the 2nd Opium War (1856-1860), the Sino-French War (1883-1885) and the Sino-Japanese War (1894-1895), intense battles by both armies and navies might bring rapidly growing military spending, and Columns 1 to 4 consider the role of them. Columns 1 to 3 use dummies for a specific war and Column 4 counts the total number of wars at the prefectural level. As they indicate, no international wars explain the variation of lijin taxation, indicating the role of wars to be 'the flies on an elephant' (Motono, 2000). Column 5 considers

[24] Using other Taiping measures gives robust results.

[25] In Column 2 of Table 4, a one-standard-deviation increase in the *Taiping Severity* indicates a 2.362 increase for the weighted number of lijin employees (mean = 7.704). In Column 4, a one-standard-deviation increase in the *Taiping Severity* indicates a 3.891 increase for the weighted annual lijin revenue (mean = 7.903).

[26] Using *Weighted Number of Lijin Employees* or *Weighted Annual Lijin Revenue* as the dependent variable gives robust results. Even if I do not include any controls, none of the columns give significant positive results.

another factor that frequently led to heavier taxation in the Qing China – natural disasters. I construct an indicator to measure the overall severity of natural disasters from 1851 to 1911 by compiling the data in CAMS (1981). Table 2 introduces the calculating method. I regress the density of main lijin stations to it and find the key coefficient significantly negative. This may contradict our intuition as natural disasters usually led to more irregular spending on disaster relief (Will et al., 1991), which called for more fiscal revenue by the state. However, the disasters like floods and droughts in fact impeded the lijin taxation because the lijin was a levy on the goods in transit and it required the transport network to be well maintained. This justifies the negative role of natural disasters.

4. Mechanisms

After establishing the link from the Taiping Rebellion to the lijin taxation, this section verifies the mechanisms in this historical narrative. Firstly, I provide evidence for the two-phase development of the lijin taxation, 'expansion' in the 1850s and 1860s and 'persistence' afterwards. Meanwhile, for the post-Rebellion era, the lijin, as an indirect tax, should be responsive to the local economic conditions if I take the postwar recovery into consideration.

Secondly, I discuss the fiscal structure per se – how warfare led to population loss, which facilitated the recession of agricultural production and decline of land taxation. The prefectures with greater loss would have more urgent needs to generate the lijin revenue as a compensation. Finally, I introduced how the lijin revenue was spent. In a long run the lijin would strengthen the local autonomy and I offer evidence on local industrialization and representative politics during the New Policy Decade (1900s).

4.1. Institutional Expansion and Persistence

Considering the two-phase development of the lijin taxation over time I provide more detailed evidence. Given the limitation of primary materials it is impossible to track the formation of each lijin station and construct a panel dataset in number of stations. However, the text in *the Financial*

Reports implies the time for a prefecture to operate the lijin institutions for the first time. I will flexibly use certain cross sections in the analysis below.

I firstly investigate the expansion of the lijin institutions during the Rebellion. I count the battles and generate new count variables such as *Taiping Duration (Dec.1850-Dec.1856)*, *Taiping Duration (Jan.1857-Dec.1860)*, etc. and use them to predict whether there were the lijin operations within four years. Table 6 provides the results of logistic regressions with *Lijin Dummy* for a specific year as the dependent variable. All columns show that more battles were linked to a higher probability for the lijin taxation to arise.[27]

Then I examine the post-Rebellion persistence of the lijin taxation. After the Rebellion, the Qing central government advocated the abolition of the lijin system but was fiercely resisted at all local levels. Under a compromise the lijin bureaus and stations became regular institutions in the name of financing post-war recovery and local defence. In the following decades, the lijin system showed its great inertia: most stations stayed intact, and new stations did emerge because of local institutional learning under new fiscal constraints.[28] However, as Figure 4 indicates, the spatial variation of the lijin institutions took shape during the Rebellion, and further changes were merely fine-tuning. I regress the density of main lijin stations in the 1900s to the lijin dummy for a specific year during the Rebellion and check whether an early lijin introduction led to heavier lijin taxation in the later phase. The results are in Table 7. In Columns 1 and 2, only 34 prefectures introduced the lijin by 1856 and the long-run prospect was far from clear. By contrast, the remaining columns show that an early lijin introduction predicts the density of main stations in the 'persistence' phase well. In Column 6 for example, if a prefecture had introduced the lijin system by 1864, the density of the main lijin stations in the 1900s would increase by 0.101, which means 1.2 extra main lijin stations given the median prefectural land size.

[27] The conclusion holds if I change the measures for the Taiping Warfare. Results are robust no matter how I set control variables.

[28] For example, the northwestern Gansu province witnessed a rapid expansion of the lijin institutions during the 1870s because of the fiscal needs to suppress the Northwestern Ethnic (Muslim) Rebellion and support postwar recovery (Luo, 1936).

Besides, in the 'persistence' phase I expect the post-war economic conditions to impact the scale of the lijin taxation, too. There are few indicators about economic conditions at the prefectural level, and I use the only available data, population density in 1880 and 1910 (Cao, 2001) to proxy them. Results are given in Table A.5. The prefectural population density in either 1880 or 1910 predicts the scale of the lijin taxation very well, no matter whether I add controls.

4.2. The Decline of Land Taxation

This section focuses on the Qing fiscal revenue structure. As implied in Figure 2 the Qing fiscal regime was under great pressure: when the military spending increased rapidly, the dominant land tax revenue shrunk sharply because the Taiping warfare led to the stagnation of agricultural production. Firstly, thousands of soldiers and commoners died of the armed conflicts every year, and many people fled from the warzone (Li and Lin, 2015); the insufficient labour input constrained the labour-intensive agricultural production. Meanwhile the short-sighted Taiping regime was extractive, and agricultural infrastructure and institutions, like irrigation and short-term lending system, were not well maintained. After all, the warfare per se meant high uncertainty and insecurity for both landlords and peasants.

Agricultural stagnation and the consequential lack of land taxation were an indispensable condition for the rise of the lijin. If agricultural production was normal, and the traditional land taxation system was run smoothly, the Qing officials could appropriate the existing land tax revenues for urgent military use.[29] However in fact, the national level of land taxation shrunk by nearly 50%, and such withering of land taxation in the warzone pushed the local governments to turn to tax the commercial activities. I further propose that given other factors constant, the prefectures with heavier pre-Rebellion land tax burden would establish more lijin stations when facing the warfare, as the lijin revenue could serve as the substitute of land tax revenue. I verify this channel with the existing population and taxation data (Cao, 2001; Liang, 1980). Table 8 examines the link from population density change to the lijin taxation. This evidence is implicit as we must assume that population was proportional to agricultural output (Li, 2002). All columns give significant results

[29] In fact, many of them did so in the initial phase of the Rebellion (Zhou, 2006).

that meet our expectation: more severe population decline from 1851 to 1880 was linked to a larger scale of lijin taxation.[30]

Then I employ the pre-Rebellion land tax revenue data (Liang, 1980) and examine whether the lijin compensated land tax. I consider adding an interaction between the pre-Rebellion land tax and the Taiping impact, and the specification is

$$Lijin_i = \gamma_0 + \gamma_1 Land\ Tax_i + \gamma_2 Taiping_i + \gamma_3 Land\ Tax_i * Taiping_i + \boldsymbol{W}'_i \boldsymbol{\gamma} + \varepsilon_i$$

where i denotes prefectures. $Land\ Tax_i$ denotes the per capita land tax revenue in 1820 – the only year we have data – for prefecture i. $\boldsymbol{W}'_i$ consists of the aforementioned control variables. ε_i denotes the error term. The standard error is robust and clustered at the provincial level. γ_3 is the coefficient of interest. Results are presented in Table 9. The coefficients for the pre-Rebellion land tax and the Taiping impact are not robust as one correlates the other and the interaction intervenes. However, the coefficients for the interaction in all columns are positive and significant at 1% level, implying that the Taiping impact would strengthen the role of the lijin as a substitute for land tax. For the prefectures with heavier land taxation before the Rebellion, the warfare would push them to generate more alternative revenue – the lijin – to make ends meet and to finance the urgent military actions.[31]

4.3. The Consequences of Lijin Taxation

To understand how the lijin taxation led to unprecedented local autonomy I offer evidence from the expenditure side and draw general economic and political implications in this section. During the Rebellion, the lijin was dominantly invested in military activities. This is supported by qualitative evidence (Luo, 1936; He, 1981; Chen, 1992, 2010; Zhou, 2000; Ni, 2017) although we cannot obtain micro-level data on this argument. If I assume the spatial variation of military investment to persist for decades after the Rebellion, the provincial data by Zhou (2000) can offer suggestive

[30] I only obtain cross-sectional population data for two years after the Rebellion, 1880 and 1910. Results in Table 8 are robust when I change the measures of the lijin taxation.

[31] For all columns, the joint F-tests for γ_1, γ_2 and γ_3 reject the null hypothesis. Besides, the conclusion here holds if I change the measures for the lijin taxation.

evidence. Figure A.11 presents the scattered plots of the military budget for establishing modern armies to the scale of the lijin taxation in 1904 at the provincial level, and the positive correlation is evident.

Local Industrialization

Besides long-lasting military investment, local governments had more diversified spending pattern such as the increasing investment in modern industries (Zhou, 2000; Halsey, 2013). The Self-strengthening Movement (1860s-1890s) (洋务运动) was the most influential economic campaign as a reflection of local fiscal autonomy from the expenditure side. Although Fairbank (1980) regarded it as a Chinese response to the Western presence by strengthening China's defence capacities, the indigenous condition – sufficient local fiscal autonomy – was a prerequisite. The Qing central state almost played no role in this campaign while the key actors were dominantly local governors who controlled the considerable lijin revenue (Wu, 2001). Since the 1860s they established numerous modern enterprises in both heavy and light industries. Plenty of qualitative evidence shows that those enterprises had direct links to the local lijin finance, such as Anqing Arsenal by Zengguofan, Shanghai/Suzhou/Nanjing Arsenals, Tianjin/Shanghai Business Telegram Bureau, and Steamship Business Bureau by Li Hongzhang, Fuzhou Shipyard by Zuo Zongtang, Canton Machinery Bureau by Ruilin, etc. (Wright, 1962; Zhou, 2000; Xu and Wu, 2000). More importantly there was a spillover effect from the official-led to private firms in the final years of the Qing Empire because of technological diffusion and introduction of modern infrastructure (Wu, 1985). The widespread and persistent local fiscal autonomy with the lijin as a back-up force played a crucial role in this process, the first wave of industrial modernization in a bottom-up way.

To verify the link between the lijin taxation and local industrialization, I compile the industrial dataset by Du (1991) and locate the recorded 1,205 industrial firms founded between 1860 to 1911. I aggregate them at the prefectural level and calculate the density of firms for each prefecture. Then I conduct OLS regressions at the prefectural level and present the results in Columns 1 and 2 of Table 10. In Column 3 I only include the heavy industries (machinery, chemicals,

infrastructure, transport, fuel and mineral) and the significance is robust.[32] Here I estimate the marginal effect of the lijin taxation on local industrialization with Column 2. If the density of the lijin stations increased by one unit, the density of the modern industrial firms would increase by 4.074; it means that an extra main lijin station would bring four modern industrial firms to this prefecture.

Local Representative Politics

As I mention above, the independent lijin revenue was autonomously spent at the local level. This considerable expenditure led to growing investment in both military and civil affairs, and more importantly, the local fiscal autonomy intertwined with awareness of political self-determination and further facilitated the withering of the central authorities and the rise of local political powers in the final decade of the Qing Empire. This part employs the 1908 provincial parliament election information by Zhang (2013). From 1900, the Qing central state launched a series of political reforms including the abolishment of the Civil Service Examinations, the administrative, military, and legal reforms and the radical 'preparations for constitutionalism'. One important aspect of the 'preparations' for the central state was to recognize the active role of local elites in regional affairs and promote the establishment of provincial parliaments (谘议局) by civil elections (Xiao, 1999; Hou, 2011). Although the central state set quotas for provinces, the election within a province was highly competitive, and prefectures with strong military, fiscal and intellectual capacities had greater voices in a provincial parliament by winning more seats. I assume that the lijin, as an important aspect of fiscal autonomy, proxies well for local political self-determination and use the prefectural data to examine this link.

By referring to Zhang (2013) I sort the 1,643 successful candidates by prefecture and generate a count variable, the number of representatives, at the prefectural level. Then I regress it to the scale of the lijin taxation, and Table 10 exhibits the results. Columns 4 and 5 are results of Poisson regressions; Column 6 considers the population in 1910 and uses the weighted number of

[32] For Columns 1 to 3, using *Weighted Number of Lijin Employees* or *Weighted Annual Lijin Revenue* as the independent variable gives robust results.

representatives as the dependent variable. All three columns give significant results.[33] Regarding the magnitude, I take Column 6 as an example: if the density of main lijin stations increased by one units (1.2 stations on average), there would be 2.9 more representatives given the median prefectural population (median = 5).

5. Concluding Remarks

Political disorder plays a crucial role in strengthening the fiscal capacity for a state, and this article chooses the chaotic 19th-century Qing China to study the relationship between the internal rebellion and the rise of the indirect taxation. This article tries to offer fresh views on the transitional process of China's fiscal modernization by highlighting the pivotal role of an indigenous shock, the Taiping Rebellion. Empirical evidence at the prefectural level verifies the strong link from the Taiping Rebellion to the rise and persistence of local indirect taxation. Shrinking primary sector and declining land taxation were a key channel inducing local governments to tax on short-distance trade and mitigate the fiscal constraints. After the Rebellion, the self-serving local lijin institutions persisted for decades and the autonomous lijin served as an indispensable fiscal resource at the local level. This article draws general implications by linking fiscal capacity to industrialization and representative politics in the final years of the Qing Empire. With above findings in the Chinese context, this article speaks to the well-recognized fiscal-military theory and rethinks over the role of internal political disorder and the justifiability of indirect taxation, both of which are under-explored in the current literature.

[33] The *Weighted Number of Lijin Employees* or *Weighted Annual Lijin Revenue* predicts robust results.

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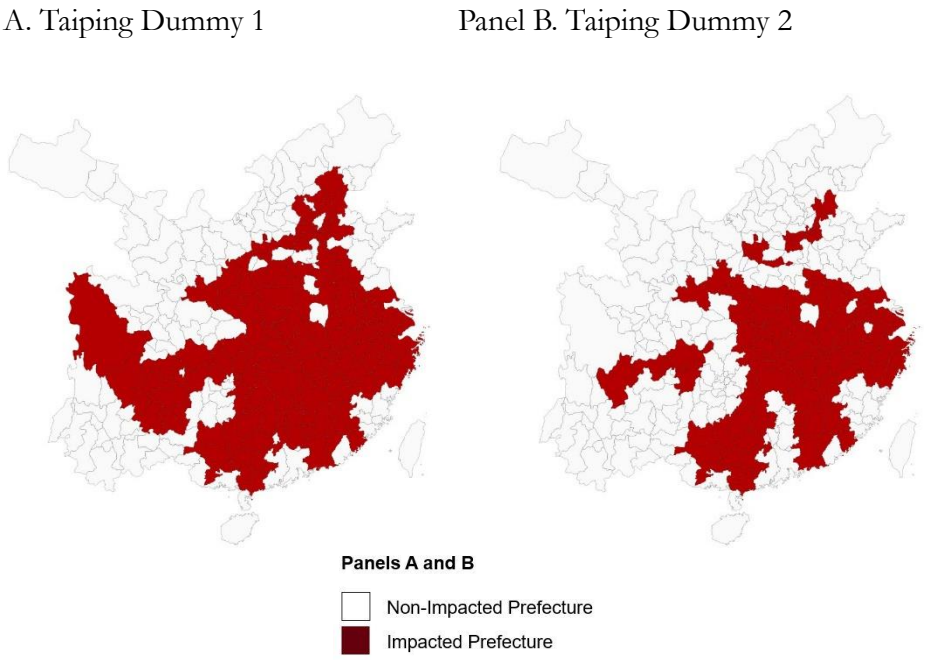
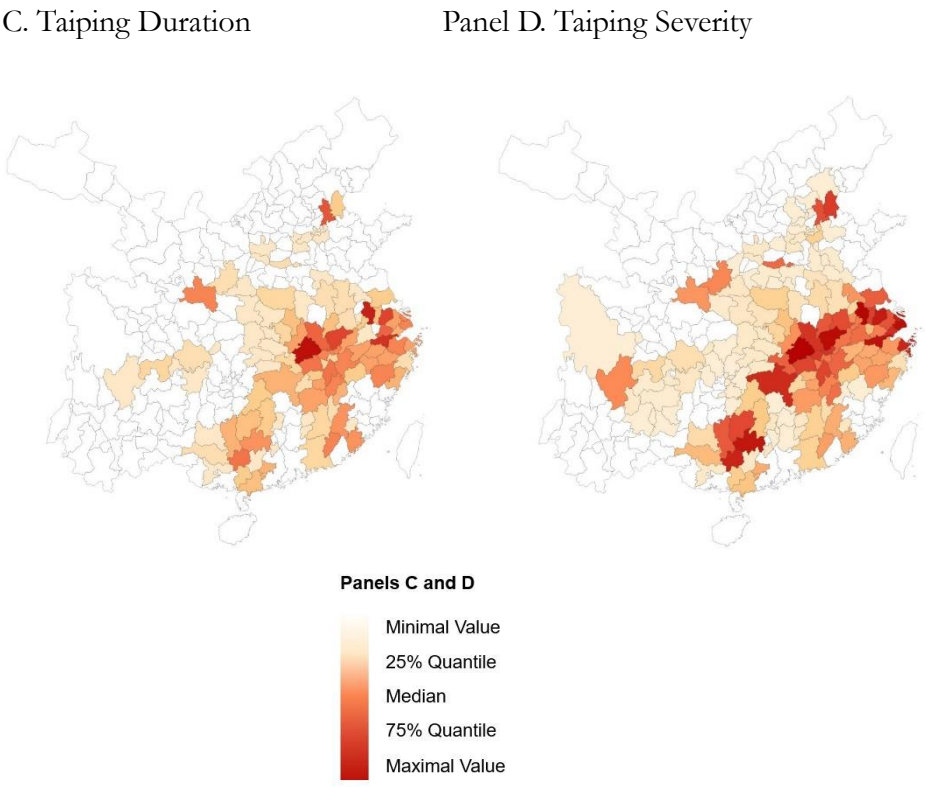
Tables and Figures

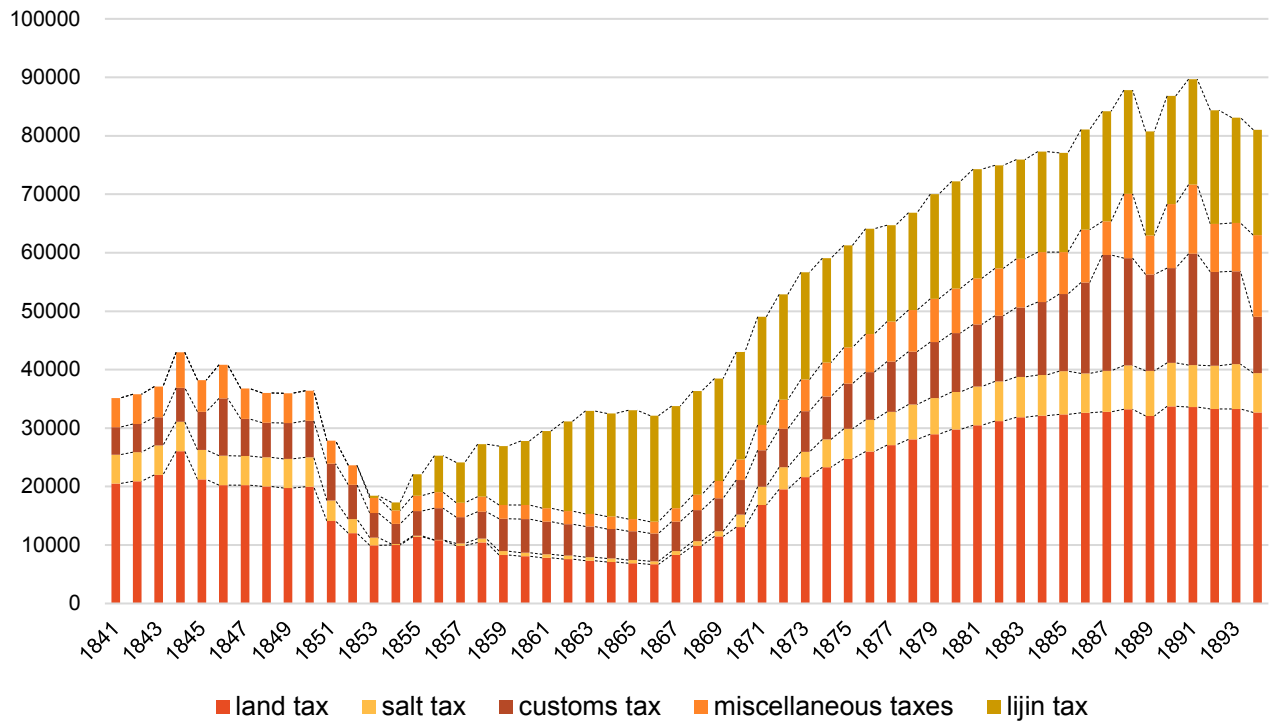
Figure 1. The Taiping Impact at the Prefectural Level





Source: see the text and Table 1.

Figure 2. Qing National Fiscal Revenue Structure, 1841-1894 (in 10^3 silver taels)



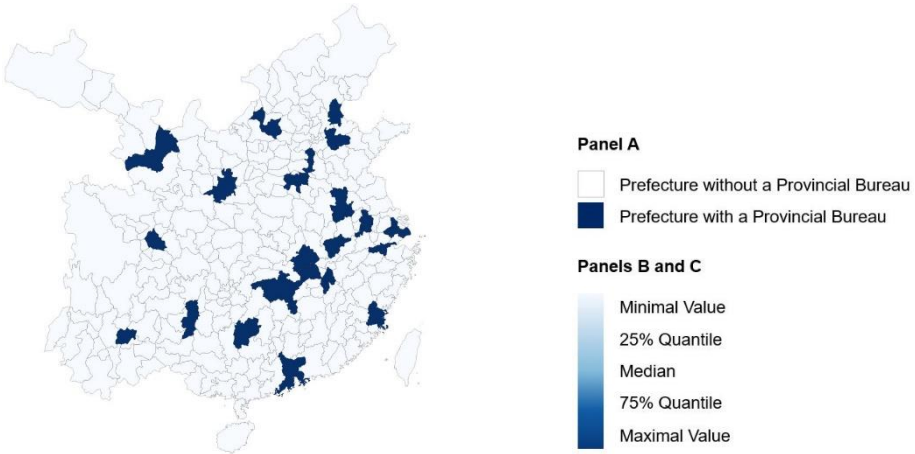
Notes:

1. If the records were in copper coins, I convert them into silver taels with the exchange rate in Luo (1936).
2. The land tax revenue does not include the tax in kind.
3. For some years I cannot obtain data for salt tax but can infer from regional records (Ni, 2013, 2017). For example, if I obtain numbers for Lianghuai (两淮) salt region (For the Qing 'salt region' institutions see Ni (2013)), I will estimate the national salt tax revenue proportionally based on earlier records (i.e. the 1840s' records indicate that the annual revenue for the Lianghuai was 42% of the national salt tax revenue). Hence I estimate the national numbers based on the Lianghuai ones.
4. For years with missing data, case by case I construct exponential, logarithmic or linear models with existing data points, and fill in the blanks with fitted values.
5. The figure does not present data after 1894 as another exogenous shock, the Sino-Japanese War, led to further institutional transitions.

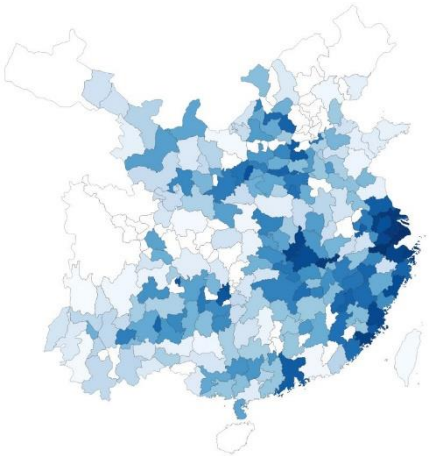
Source: Kun (1899); Liu (1901); Ni (2013, 2017); Shi (2009); Zhou (2000).

Figure 3. The Lijin Taxation at the Prefectural Level

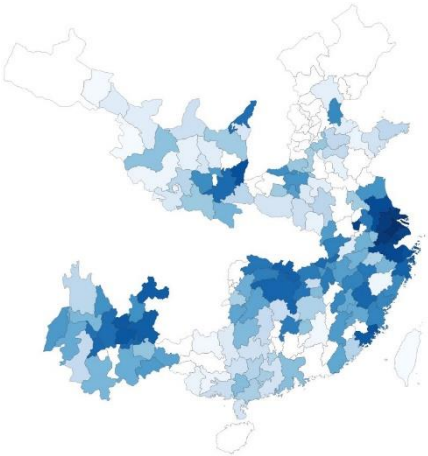
Panel A. Dummy for Provincial Bureaus



Panel B. Density of Main Stations



Panel C. Density of Additional Stations

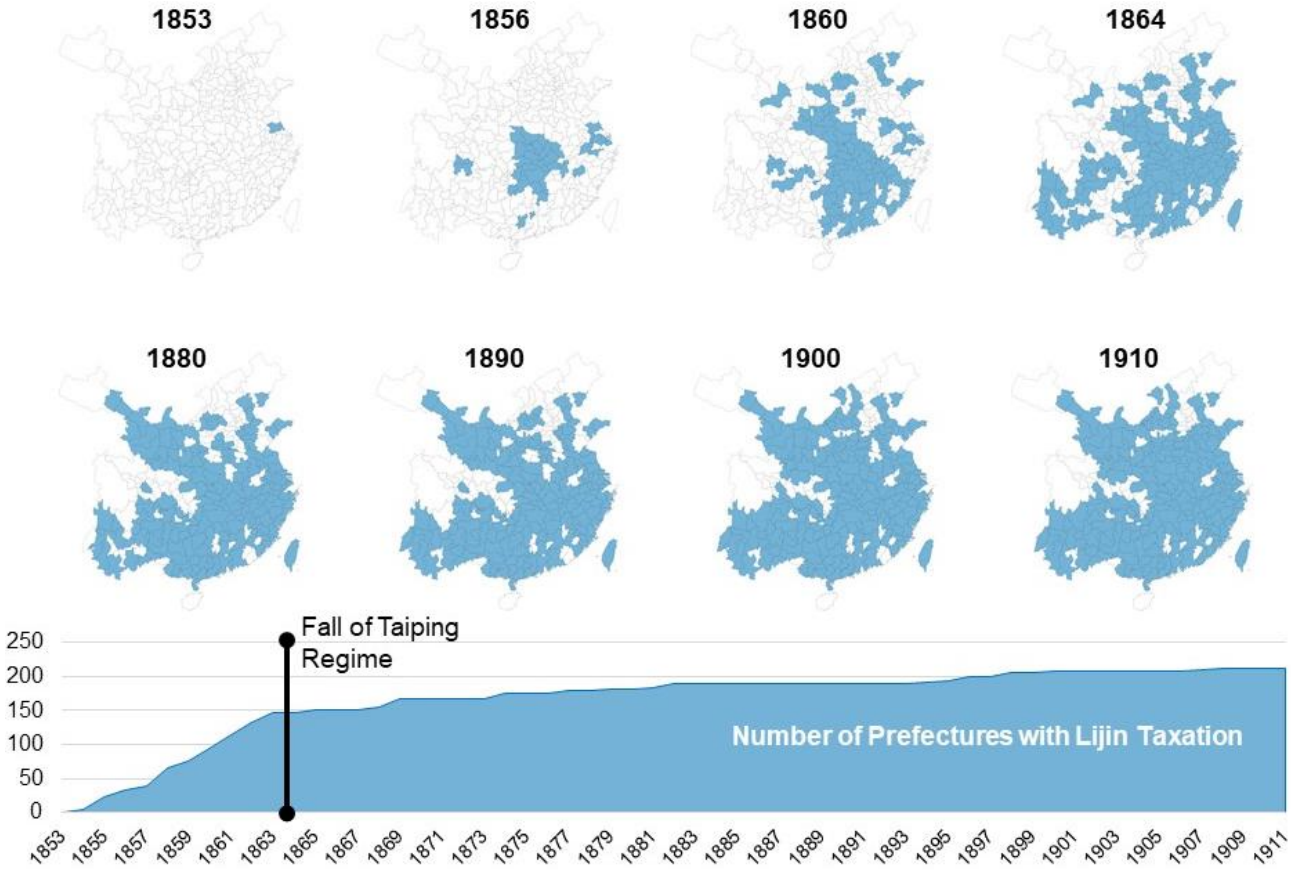


Note:

1. Panel C provides an incomplete image because four provinces (Hubei, Sichuan, Guizhou and Shanxi) lacked relevant records.

Source: see the text and Table 1.

Figure 4. The Rise and Persistence of the Lijin Institutions, 1853-1910



Source: see the text.

Table 1. Calculating Methods for Independent and Dependent Variables

Category	Variable	Definition and Calculating Method
Key Independent Variable	*Taiping Dummy 1*	*Taiping Dummy 1* = 1 if impacted (including passing-by, mild governance, armed conflicts and large-scale battles)
	Taiping Dummy 2	*Taiping Dummy 2* = 1 if impacted (armed conflicts and large-scale battles only)
	Taiping Duration	*Taiping Duration* = *n* if a prefecture was impacted (armed conflicts and large-scale battles only) for *n* months
	Taiping Severity	*Taiping Severity* = $\sum_{i=1}^{183} s_i$ / 1000 where s_i stands for the severity score (0, 1, 2, 10 or 100) for the month *i*, and there were 183 months in total (Dec. 1850 to Feb. 1866); **100 points**: large-scale battles with 10,000+ soldiers at least from either side and followed by severe casualties (usually 1,000+); **10 points**: small-scale armed conflicts; **2 points**: passing-by of the Taipings; **1 point**: mild governance by the Taipings; **0 points**: no impact recorded
Dependent Variable	*Density of Main Lijin Stations*	*Density of Main Lijin Stations* = *no. of main stations* / *land size* in km² * 1000
	Weighted Number of Lijin Employees	For Southeastern provinces, *Weighted Number of Lijin Employees* = (30* *no. of provincial bureau* + 35**no. of main stations*) / *land size* in km² *1000 For the rest of China Proper, *Weighted Number of Lijin Employees* = (30* *no. of provincial bureau* + 18**no. of main stations*) / *land size* in km² *1000
	Weighted Amount of Annual Lijin Revenue	*Weighted Amount of Annual Lijin Revenue* = *average provincial revenue* (1890-1899) in 10^3 silver taels * (*no. of prefectural employees* / *no. of provincial employees*) / *land size* in km² * 1000

Source: see the text and Appendix A.

Table 2. Calculating Methods for Other Variables

Category	Variable	Definition and Calculating Method
Geographical conditions	*Coast*	*Coast* = 1 for a prefecture by the coastline
	River	*River* = 1 for a prefecture by the Yangzi River or the Great Canal
	Latitude	Latitude of the centre of a prefecture in degree
	Ln(Size)	Log of land size in km^2
Pre-1850 political and economic conditions	*Political Control*	Distance to the nearest provincial capital in km^2
	Ln(1820 Population)	Log of population in 1820 in 10^3
	Distance to a Custom	Distance to the nearest domestic custom (Changguan, 常关) in km^2
Post-1850 shocks	*Treaty Port Duration*	Number of years for a prefecture to own treaty port(s) for foreign trade till 1911
	Other Rebellions	Dummy Variables for the Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion, Northwestern Ethnic Rebellion and Boxer Rebellion
Other variables in robustness checks and discussions	*International War*	Dummy Variables for the 1st and 2nd Opium Wars, the Sino-French War and the Sino-Japanese War
	Severity of Natural Disasters	The overall impact of natural disasters (both droughts and floods): *Severity* = $\sum_{i=1851}^{1911}\lvert d_i - 3\rvert$ for a prefecture; The d_i stands for the score (1 to 5 points) for the year *i*; **5 points:** severe drought; **4 points:** light drought; **3 points:** no drought or flood; **2 points:** light flood; **1 point:** severe flood
	Population Density Change 1851-80	⊿ *Population Density* = (*Population in 1880* in 10^3 – *Population in 1851* in 10^3) / *Land size* in km^2
	1820 Land Tax	Land taxation burden (in both currency and kind) for a prefecture in 1820 in 10^3 silver taels; Grains are converted into silver taels using the prices for the specific region in 1820
	1820 Land Tax Per Capita	*1820 Land Tax p.c.* = *1820 Land Tax* / *1820 Population* in 10^3
	Density of Industrial Firms	*Density of Industrial Firms* = *Number of Industrial Firms* set up between 1860 and 1911 / *Land size* in km^2 * 1000
	Density of Heavy Industrial Firms	Same as above; only heavy industries included – machinery, chemicals, infrastructure, fuel & mineral, and transport
	Number of Provincial Parliament (Ziyiju) Representatives	Count variable for the number of representatives in provincial parliament (Ziyiju, 谘议局) in 1908
	Weighted Number of Provincial Parliament (Ziyiju) Representatives	*Weighted Number* = *Number* / *Population in 1910* in 10^3 * 1000

Notes:

1. The values of *Coast* and *River* are generated from Tan (1982); those of *Latitude*, *Ln(Size), Political Control and Distance*

to a Custom are from CHGIS (Version 6) by Harvard University. The locations of customs are identified in Ni (2017).

2. The population data is by Cao (2001).
3. The information on the treaty ports is from Yan (1955).
4. The information on other rebellions is from Guo (1989) and that on international wars is from Spence (1990).
5. The severity of natural disasters is generated with the records by the Chinese Academy of Meteorological Sciences (CAMS) (1981).
6. The taxation data of 1820 is from Liang (1980). When I do the conversion from grains to silver taels, I refer to the price information for grains in the Qing Grain Price Database by the Institute of Modern History, Academia Sinica in Taiwan (*http://mhdb.mh.sinica.edu.tw/foodprice/*).
7. The data on the industrial firms from 1860 to 1911 is by Du (1991). The data on the 1908 provincial parliament representatives is by Zhang (2013). I locate every firm and representative into a prefecture with the information in Tan (1982).
8. I generate other variables such as population density and Lijin dummy for a specific year in Parts 3 and 4. They are self-explanatory by names.
9. For descriptive statistics, see Appendix C.

Table 3. Taiping Rebellion and Lijin Taxation

Dependent Variable	OLS *Density of Main Lijin Stations*			
	(1)	*(2)*	*(3)*	*(4)*
Taiping Dummy 1	0.139*			
	(0.074)			
Taiping Dummy 2		0.209*		
		(0.100)		
Taiping Duration			0.042***	
			(0.010)	
Taiping Severity				0.637***
				(0.166)
Constant	0.187***	0.184***	0.184***	0.213***
	(0.045)	(0.041)	(0.040)	(0.044)
Obs.	266	266	266	266
R-squared	0.034	0.073	0.174	0.163

(Continued)

Dependent Variable	OLS *Density of Main Lijin Stations*							
	(5)	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
Taiping Dummy 1	0.089*				0.120*			
	(0.045)				(0.067)			
Taiping Dummy 2		0.146*				0.115**		
		(0.075)				(0.052)		
Taiping Duration			0.030***				0.021**	
			(0.007)				(0.009)	
Taiping Severity				0.404***				0.239**
				(0.114)				(0.114)
Ln(Size)	-0.151**	-0.150***	-0.155***	-0.158***	-0.152***	-0.152***	-0.155***	-0.156***
	(0.053)	(0.051)	(0.050)	(0.051)	(0.047)	(0.047)	(0.047)	(0.048)
Coast	0.345**	0.347**	0.331**	0.306**	0.217	0.193	0.183	0.168
	(0.154)	(0.136)	(0.123)	(0.126)	(0.132)	(0.123)	(0.115)	(0.116)
River	0.222**	0.214**	0.173**	0.160*	0.185**	0.179**	0.156*	0.156*
	(0.092)	(0.089)	(0.082)	(0.081)	(0.066)	(0.066)	(0.075)	(0.079)
Latitude	-0.004	-0.002	-0.001	-0.004	0.016**	0.015**	0.015**	0.012*
	(0.009)	(0.008)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)
Ln(1820 Population)	0.060**	0.050*	0.047*	0.065**	0.080***	0.082***	0.078**	0.095***
	(0.026)	(0.024)	(0.025)	(0.026)	(0.021)	(0.023)	(0.029)	(0.030)
Political Control	-0.000	-0.000*	-0.000	-0.000	-0.000*	-0.000*	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Distance to a Custom	0.000	0.000	0.000*	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Treaty Port Duration					0.006***	0.006***	0.006***	0.006***
					(0.001)	(0.001)	(0.001)	(0.002)
Other Rebellions					Yes	Yes	Yes	Yes
Constant	1.265**	1.268**	1.286**	1.311**	0.609*	0.664*	0.686*	0.713**
	(0.546)	(0.535)	(0.519)	(0.517)	(0.329)	(0.323)	(0.326)	(0.334)
Obs.	266	266	266	266	266	266	266	266
R-squared	0.368	0.382	0.420	0.410	0.584	0.583	0.596	0.588

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2.

The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion, Northwestern Ethnic Rebellion and Boxer Rebellion.

Table 4. Robustness Check I: Taiping Rebellion and Lijin Taxation

Dependent Variable	OLS *Weighted Number of Lijin Employees*		OLS *Weighted Annual Lijin Revenue*	
	(1)	*(2)*	*(3)*	*(4)*
Taiping Severity	25.340***	9.924*	40.592**	16.350**
	(6.299)	(5.098)	(16.632)	(6.774)
Ln(Size)		-4.588***		-7.161*
		(1.488)		(3.611)
Coast		6.270		9.648**
		(4.117)		(3.544)
River		6.157*		15.758
		(2.936)		(9.924)
Latitude		0.202		0.824
		(0.254)		(0.716)
Ln(1820		2.997***		4.024*
Population)		(1.031)		(2.298)
Political		-0.010		-0.008
Control		(0.007)		(0.010)
Distance to		-0.001		0.005
a Custom		(0.003)		(0.007)
Treaty Port		0.222***		0.195**
Duration		(0.058)		(0.074)
Other Rebellions		Yes		Yes
Constant	5.791***	25.484**	4.834**	18.483*
	(1.493)	(9.049)	(2.251)	(10.442)
Obs.	266	266	266	266
R-squared	0.203	0.640	0.170	0.548

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2.

The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion, Northwestern Ethnic Rebellion and Boxer Rebellion.

Table 5. Robustness Check II: International Wars, Natural Disasters and Lijin Taxation

Dependent Variable	OLS *Density of Main Lijin Stations*				
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
2nd Opium War	0.286				
Dummy	(0.242)				
Sino-French War		-0.133			
Dummy		(0.204)			
Sino-Japanese War			-0.630		
Dummy			(0.488)		
Number of				0.008	
International Wars				(0.114)	
Severity of					-0.004**
Natural Disasters					(0.002)
Ln(Size)	-0.151***	-0.160***	-0.149***	-0.155***	-0.162***
	(0.051)	(0.053)	(0.048)	(0.051)	(0.049)
Coast	0.156	0.111	0.158	0.150	0.184
	(0.130)	(0.127)	(0.122)	(0.104)	(0.120)
River	0.186**	0.204**	0.200**	0.201**	0.192**
	(0.076)	(0.078)	(0.075)	(0.072)	(0.069)
Latitude	-0.006	0.000	0.003	0.012*	0.014**
	(0.008)	(0.007)	(0.006)	(0.006)	(0.005)
Ln(1820	0.102***	0.108***	0.103***	0.105***	0.099***
Population)	(0.034)	(0.033)	(0.031)	(0.033)	(0.028)
Political	-0.000	-0.000	-0.000	-0.000	-0.000**
Control	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Distance to	0.000	0.000	0.000	0.000	0.000
a Custom	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Treaty Port		0.017***	0.017***	0.006*	0.006***
Duration		(0.005)	(0.004)	(0.003)	(0.002)
Other Rebellions	Yes	Yes	Yes	Yes	Yes
Constant	1.161**	1.055***	0.884**	0.682*	0.934**
	(0.407)	(0.365)	(0.332)	(0.341)	(0.364)
Obs.	266	266	266	266	266
R-squared	0.463	0.535	0.568	0.571	0.582

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2.

The 'treaty port durations' for Columns (2) to (3) are different as the wars broke out in different decades.

The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion, Northwestern Ethnic Rebellion and Boxer Rebellion. For Columns (1) to (3), I only include rebellions in the same era as the relevant international war.

Table 6. The Rise of Lijin: Taiping Rebellion and Lijin Taxation by Stages

		Logistic	
Dependent Variable	*Lijin Dummy for 1860*	*Lijin Dummy for 1864*	*Lijin Dummy for 1868*
	(1)	*(2)*	*(3)*
Taiping Duration 1850-56	0.192*		
	(0.112)		
Taiping Duration 1857-60		1.199*	
		(0.649)	
Taiping Duration 1861-64			0.540***
			(0.206)
Ln(Size)	0.419	0.187	0.280
	(0.394)	(0.394)	(0.410)
Coast	-0.019	0.276	-0.085
	(0.609)	(0.661)	(0.868)
River	-1.225**	1.538***	1.564***
	(0.578)	(0.315)	(0.350)
Latitude	-0.034	-0.111*	-0.143**
	(0.054)	(0.063)	(0.064)
Ln(1820	0.395	0.916***	0.811***
Population)	(0.246)	(0.286)	(0.268)
Political	-0.005**	-0.005	-0.005
Control	(0.003)	(0.003)	(0.003)
Distance to	-0.003**	-0.001	-0.001
a Custom	(0.002)	(0.001)	(0.001)
Other Rebellions	Yes	Yes	Yes
Constant	-4.560	-3.396	-2.389
	(2.809)	(2.997)	(3.281)
Obs.	266	266	266
R-squared	0.197	0.291	0.308

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For logistic regressions, I report the **pseudo** R^2.

The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion and Lilan Rebellion. For Columns (1) to (3) I only include rebellions of the corresponding era, namely 1850-56, 1857-60, and 1861-64.

Table 7. The Persistence of Lijin: Early Introduction and Lijin Taxation in a Long Run

Dependent Variable	OLS *Density of Main Lijin Stations*							
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Lijin Dummy For 1856	0.314	0.129						
	(0.202)	(0.076)						
Lijin Dummy For 1860			0.228**	0.118*				
			(0.081)	(0.059)				
Lijin Dummy For 1864					0.278***	0.101***		
					(0.082)	(0.035)		
Lijin Dummy For 1868							0.269***	0.110***
							(0.080)	(0.037)
Ln(Size)		-0.158***		-0.164***		-0.160***		-0.161***
		(0.051)		(0.051)		(0.050)		(0.050)
Coast		0.177		0.155		0.149		0.154
		(0.115)		(0.123)		(0.119)		(0.120)
River		0.184***		0.216***		0.176**		0.175**
		(0.063)		(0.069)		(0.074)		(0.073)
Latitude		0.013*		0.011		0.013*		0.014*
		(0.006)		(0.007)		(0.007)		(0.007)
Ln(1820 Population)		0.097***		0.093**		0.088**		0.087**
		(0.033)		(0.036)		(0.033)		(0.033)
Political Control		-0.000		-0.000		-0.000		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
Distance to a Custom Treaty Port		0.000		0.000		0.000		0.000
		0.000		0.000		0.000		0.000
		0.006***		0.006***		0.006***		0.006***
Duration		(0.001)		(0.001)		(0.001)		(0.001)
Other Rebellions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.221***	0.698*	0.180***	0.780**	0.108***	0.750**	0.106***	0.723**
	(0.046)	(0.338)	(0.052)	(0.317)	(0.033)	0.321	(0.035)	(0.313)
Obs.	266	266	266	266	266	266	266	266
R-squared	0.079	0.581	0.085	0.588	0.136	0.583	0.125	0.585

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2.

The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion, Northwestern Ethnic Rebellion and Boxer Rebellion.

Table 8. Population Density Changes and Lijin Taxation

Dependent Variable	Logistic *Lijin Dummy for 1880*		OLS *Density of Main Lijin Stations*	
	(1)	*(2)*	*(3)*	*(4)*
Population Density	-11.654**	-9.591*	-2.069***	-1.284**
Change 1851-80	(4.627)	(4.941)	(0.456)	(0.548)
Ln(Size)		0.055		-0.112**
		(0.324)		(0.046)
Coast		0.794		0.150
		(0.667)		(0.110)
River		1.523***		0.137*
		(0.585)		(0.072)
Latitude		-0.107*		0.000
		(0.059)		(0.006)
Ln(1820		1.274***		0.050**
Population)		(0.249)		(0.022)
Political		-0.004		-0.000
Control		(0.003)		(0.000)
Distance to		0.000		0.000
a Custom		(0.001)		(0.000)
Treaty Port		-0.048		0.017***
Duration		(0.063)		(0.003)
Other Rebellions	Yes	Yes	Yes	Yes
Constant	0.572*	-4.424	0.194***	0.893**
	(0.322)	(3.226)	(0.038)	(0.351)
Obs.	266	266	266	266
R-squared	0.064	0.333	0.291	0.601

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2; For logistic regressions, I report the **pseudo** R^2.

The 'treaty port duration' for Columns (1) and (2) refers to the number of years for a prefecture to own treaty port(s) for foreign trade till 1880, and that for Columns (3) and (4) refers to the number of years till 1911.

The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion and Northwestern Ethnic Rebellion.

Table 9. Taiping Rebellion, Prewar Land Taxation and Lijin Taxation

Dependent Variable	OLS *Density of Main Lijin Stations*							
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
1820 Land Tax Per Capita	0.019	-0.175	0.158	0.074	0.356	0.270	0.448*	0.366*
	(0.284)	(0.265)	(0.265)	(0.183)	(0.246)	(0.174)	(0.254)	(0.201)
Taiping Dummy 1	-0.186*	-0.102						
	(0.095)	(0.060)						
Taiping Dummy 2			-0.169*	-0.120**				
			(0.094)	(0.052)				
Taiping Duration					-0.016	-0.013		
					(0.012)	(0.008)		
Taiping Severity							-0.310***	-0.294***
							(0.102)	(0.065)
*1820Tax * D1*	2.438***	1.873***						
	(0.796)	(0.414)						
*1820Tax * D2*			2.517***	1.699***				
			(0.732)	(0.334)				
*1820Tax*Duration*					0.320***	0.208***		
					(0.059)	(0.037)		
*1820Tax*Severity*							5.238***	3.482***
							(0.519)	(0.766)
Geographic Conditions		Yes		Yes		Yes		Yes
Initial Political Conditions		Yes		Yes		Yes		Yes
Treaty Port Duration		0.006***		0.006***		0.006***		0.005***
		(0.002)		(0.002)		(0.002)		(0.002)
Other Rebellions		Yes		Yes		Yes		Yes
Constant	0.185**	0.460	0.169**	0.553*	0.151***	0.596*	0.158***	0.635*
	(0.066)	(0.304)	(0.059)	(0.317)	(0.050)	(0.329)	(0.048)	(0.344)
Obs.	266	266	266	266	266	266	266	266
R-squared	0.334	0.693	0.366	0.683	0.437	0.690	0.473	0.695

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2.

The 'geographical conditions' include the log of land size, the coast dummy, the river dummy and the latitude. The 'initial political conditions' include the log of population in 1820, the degree of political control and the distance to a custom. The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion, Northwestern Ethnic Rebellion and Boxer Rebellion.

Table 10. Consequences of Lijin Taxation: Local Industrialization and Representative Politics

Dependent Variable	OLS		OLS	Poisson		OLS
	Density of Industrial Firms		*Density of Heavy Industrial Firms*	*Number of Representatives*		*Weighted Number of Representatives*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Density of Main Lijin Stations	5.205**	4.074**	1.643**	0.523***	0.454***	2.552**
	(2.415)	(1.728)	(0.641)	(0.110)	(0.129)	(1.065)
Ln(Size)		0.207	0.059		0.195**	0.582
		(0.244)	(0.101)		(0.077)	(0.487)
Coast		-1.049	-0.544		-0.225**	-1.024
		(0.857)	(0.349)		(0.114)	(0.631)
River		0.515	0.202		-0.172**	-0.888*
		(0.425)	(0.177)		(0.074)	(0.494)
Latitude		0.078	0.029		0.008	0.071
		(0.049)	(0.019)		(0.009)	(0.060)
Ln(1820 Population)		-0.329	-0.120			
		(0.271)	(0.108)			
Ln(1880 Population)					0.620***	-1.263***
					(0.063)	(0.343)
Political Control		-0.000	-0.000		-0.002***	-0.003
		(0.001)	(0.000)		(0.000)	(0.004)
Distance to a Custom		-0.000	-0.000			
		(0.001)	(0.000)			
Treaty Port		0.064	0.033*		0.002	0.012
Duration		0.041	(0.018)		(0.003)	(0.017)
Other Rebellions		Yes	Yes			
Constant	-0.835	-3.301	-1.017	1.707***	-4.377***	6.117
	(0.528)	(2.456)	(0.941)	(0.097)	(0.555)	(5.691)
Obs.	266	266	266	266	266	266
R-squared	0.273	0.398	0.429	-	-	0.127

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2.

The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion, Northwestern Ethnic Rebellion and Boxer Rebellion.

APPENDIX

A. Data Collection for the Taiping Rebellion and the Lijin Taxation

Figure A.1. Records of Battles in Archives: An Example

二六一、楊岳斌等奏報克復金陵大概情形摺

同治三年六月十六日（方略稿本）

督辦江（西皖）南軍務・陝甘總督臣楊岳斌、總統水師全軍兵部右侍郎臣彭玉麟、留辦金陵軍務・浙江巡撫臣曾國荃奏爲官軍克復金陵，謹將大概情形馳奏，以慰宸廑，仰祈聖鑒事。

竊臣國荃合圍金陵，五月以前攻勦情形，均經督臣曾國藩馳奏在案。春夏之交，共挖地道三十餘穴，爲城逆門窄二十餘穴，提督朱南桂、李祥和、羅逵元、宋惟堂等所挖地道前後轟發五處，均未能得手。城堅而大，賊悍且多。臣國荃智盡能索，憂心如焚，於五月三十日督勦各將官攻克太平門外之僞地保城。六月初一日起，令各營逼近城根，輪流猛攻。總兵陳萬勝、王紹義、郭鵬程等死之，弁勇傷亡極多。福建提督李朝斌、候補道黃潤昌等及各營官弁益切憤怒，遂於龍膊子下山處鑽築礮臺多架，大礮日夜轟攻。一面多用滿漢土攻填龍膊子，高與城齊，一面令記名提督河南歸德鎮總兵李臣典、總兵吳宗國、何玉貴、楊鼎貴等從山麓距城十數丈開挖地道，迎日限抵城根。而蕭浮泗、張詩日、蕭慶衍、羅逵元、臭司劉連捷、記名道員彭毓橘等連日攻之益力，不收陣者半月，礮斃賊首僞王甚多。十四日朱南桂、朱惟堂聶神策門地道，盡去其月城，而大城屹立，仍未能克，傷亡尤衆。至十五日李臣典地道告成。十六日午刻，發火衝開二十餘丈，塵土蔽天，當經朱洪章、劉連捷、伍維壽、張詩日、熊登武、陳壽武、蕭孚泗、彭毓橘、蕭慶衍等率各營大隊，次第從倒口搶入城內。悍賊數千死護倒口，排列逆衆數萬，舍命抗拒。經朱洪章、劉連捷、伍維壽等從中路督將弁大呼衝殺，奮不顧身，十證十決，鏖戰三時之久，賊乃大潰。劉連捷、張詩日等遂由右路循城包抄，搶紮各門。適宋南桂、梁美材從神策門月城梯攻而入，會合踞定城北一帶。彭毓橘、蕭浮泗、蕭慶衍、武明良等由左路循城包抄，立奪朝陽、洪武、通濟等門。遭羅逵元、趙三元、易良虎、陳湜、彭椿年等從南門旁舊倒口處梯攻而入，會合踞定城南一帶。中間獨江磯石壘亦經提督黃翼陞、總兵許雲發率水師各營攻入。臣曾國荃至太平門倒口，進登富貴山督陣。見攻克省城之大勢已定，逐趕回老營，將大略情形一面具報，一面飭官軍環城內外紮定，兼扼各路要隘，發飭各軍，冀使一無漏網。計自十六日午時起至日暮，殲斃悍賊數萬，攻燬各僞府數十處，慘首逆洪首等所居巢有僞城甚大，死黨不下萬人，經官軍四面環攻，尚未破入，大約二三日內諒能勦洗淨盡。萬一城大兵單，竄漏一二，臣曾國荃惟當派隊沿途追勦，會合前路防兵悉數斬擒，免致延及他境，復留後患。其老幼婦女甚多，臣國荃傳令各營一概釋放，以普皇仁。竊念自五月底猛攻至今，官軍陣亡實數二千餘人，受傷已逾四千餘人之多。國荃於同治元年五月進兵，迄今兩載有奇，久不奏績，徒益傷亡，愧悚無地。臣玉麟於三月間率師赴上游防勦江鄂，臣岳斌奉督辦江皖軍務之命，亦經赴援江右，酌留水師數營在金陵協勦，撫臣李鴻章商調提臣黃翼陞，率淮揚水師六營，五月來此會攻，仰賴皇上廟算，獨操聖謨，廣及藉資策募力，故得竟此一簣之功，實深感幸。

除將詳細戰狀，各逆酋下落及應獎應卹人員查明，咨請督臣曾國藩具奏外，茲謹會同大學士・湖廣總督臣官文、協辦大學士・前江總督臣曾國藩、江蘇巡撫臣李鴻章由驛八百里先行馳陳，伏乞皇太后、皇上聖鑒訓示。再，此摺由臣國荃主稿，合併聲明。謹奏。

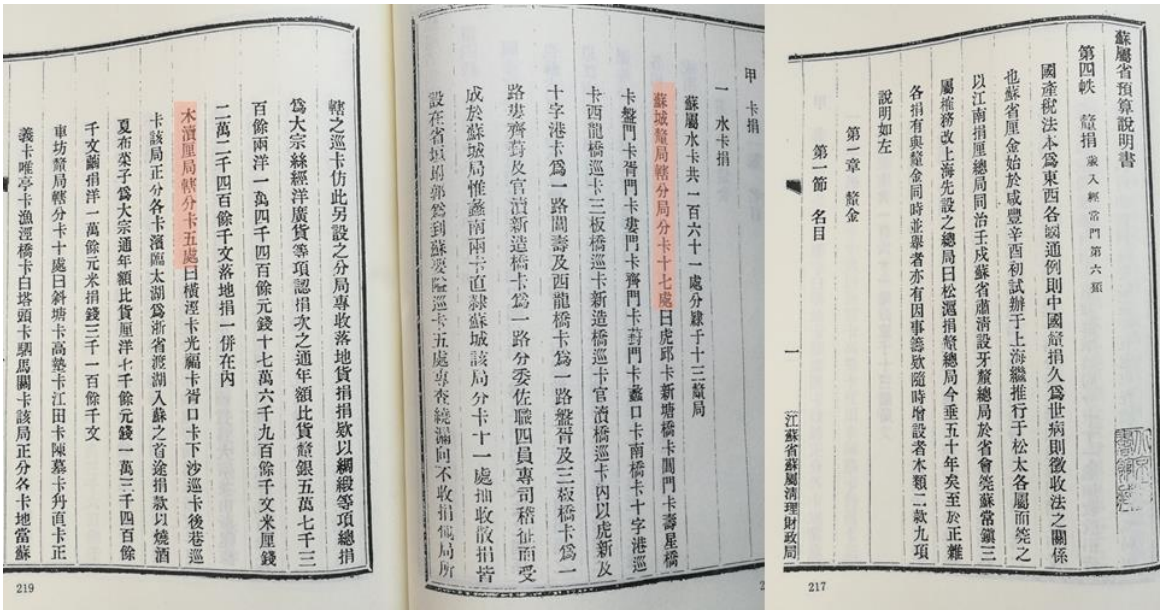
同治三年六月二十一日議政王軍機大臣奉旨，另有旨。欽此。

Note:

1. This is one of the most important memorials during the Taiping Rebellion, *the Memorial on the General Situation of Jinling Recovery by Yang Yuebin* (杨岳斌等奏报克复金陵大概情形折) on the 16th June 1864 (lunar calendar). It describes the fierce battles since the start of June, including which strategy the generals implemented, which route they took and how long it took to retake the city. It is kept as the No. 1864-261 memorial in the Vol.26 of FHAC (1996); the text has been retyped.
2. Key information is highlighted: at the night of recovery on the 16th, 'tens of thousands of' Taipings were killed; on the Qing side, from the end of May to the middle June 1864, over 2,000 Qing soldiers sacrificed and over 4,000 were injured.

Source: FHAC (1996).

Figure A.2. Lists of the Lijin Stations in Archives: An Example

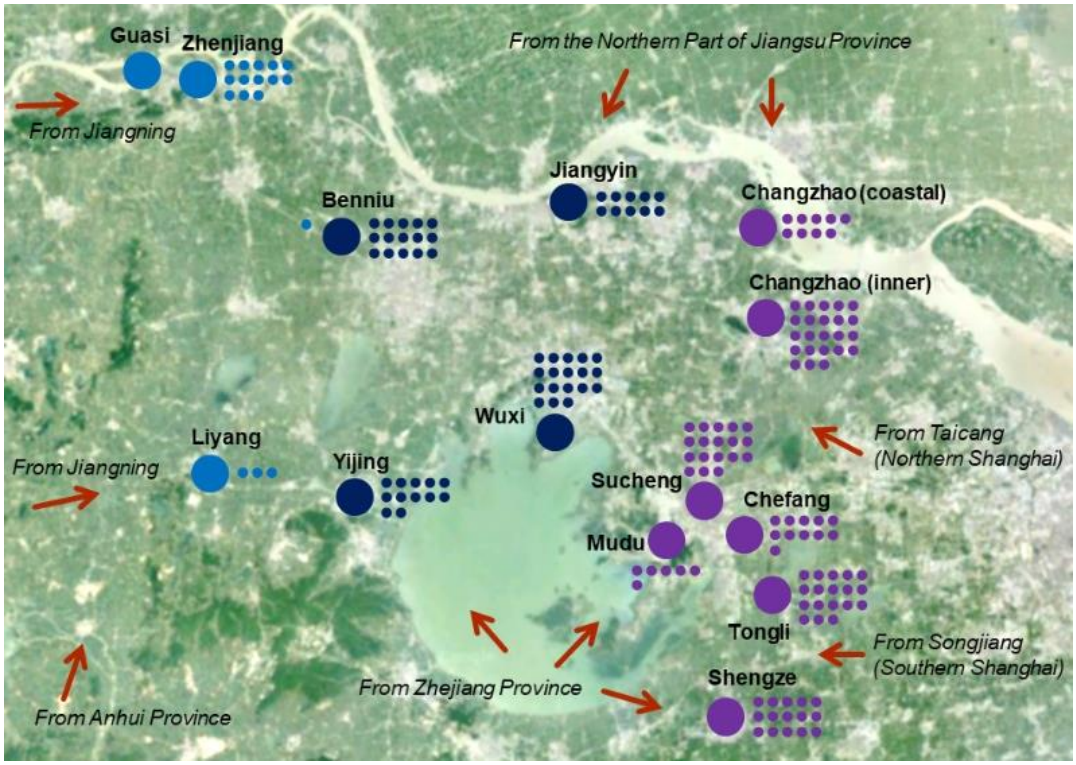


Note:

1. This is how the lijin stations were listed in *the Jiangsu Financial Report 1908* (the budget part of Suzhou division). The highlighted areas indicate the names of a main station and the number of its additional stations. This is taken from p. 217 in the Vol.16 of BL (2006).
2. Figure A.3. introduces how I locate the lijin stations.

Source: BL (2006).

Figure A.3. Spatial Distribution of the Lijin Stations for Suzhou Division of Jiangsu Province



Note:

1. Here is an example on how I obtain and compile data. The lijin stations for three rich Lower Yangzi prefectures, Suzhou, Changzhu and Zhenjiang, were supervised by the Suzhou Division of Jiangsu Province. Fortunately, many stations took the names of towns and streets, which can be precisely tracked even in today's map. This figure shows the locations of the main stations and the numbers of additional ones in cluster.
2. This is an example to show how the layout of stations was well rationalized: both the water and land transport networks were taken into consideration so that the lijin agencies could use as few stations as they could to maximize their revenue. Although the Taipings might occupy certain towns from time to time, the local governments still taxed on the short-distance trades which were still active.

Source: BL (2006) and Figure A.2.

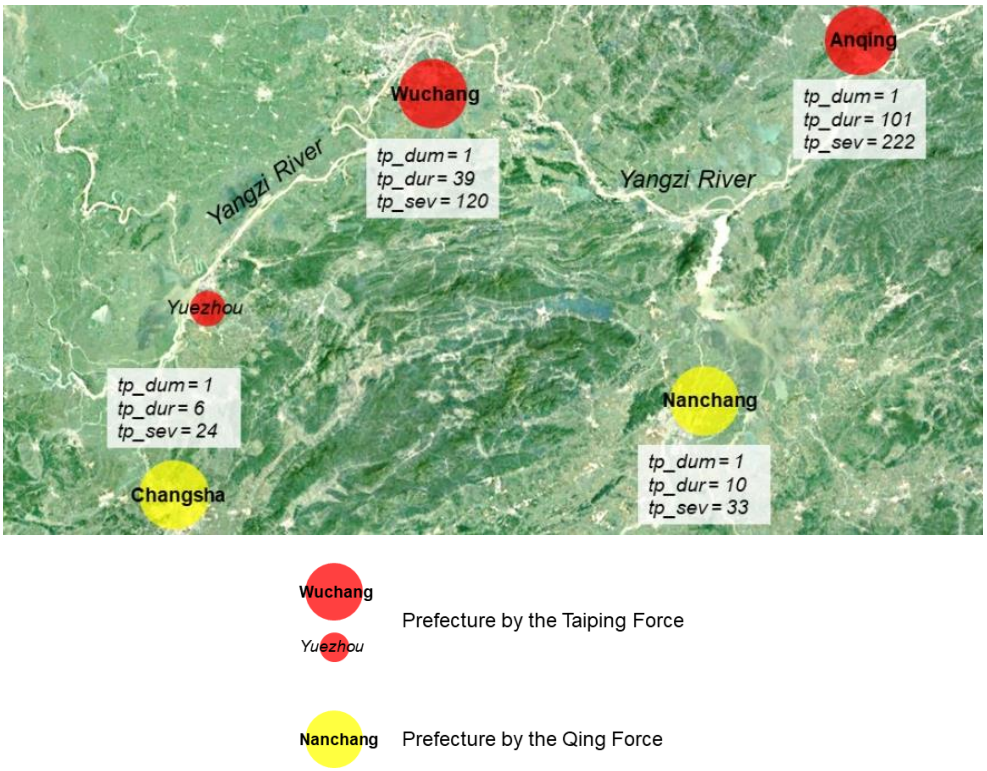
B. Were the Taiping Marches Random?

This section offers qualitative and quantitative evidence about the randomness of the Taiping military activities among provinces and prefectures. It is hard to predict that such a devastating rebellion must break out in Guangxi. There are various hypotheses for its outbreak: significant climate changes since 1800 (Liu, 1982; CAMS, 1981), increasing opium imports which shifted China's long-standing surplus to deficit in international trade and the ensuing silver deflation (Lin, 2006), the founder Hong Xiuquan's personal background, religious gifts and strong charisma (Spence, 1996) and possible land conflicts between the local and the Hakka immigrants (Platt, 2012). However, none of them implied that Guangxi had the highest probability to give birth to a rebellion which served the greatest threat to the Qing's rule. Hence regarding the fiscal story that I outline, the outbreak of the Taiping Rebellion was an exogenous event.

Then we should rethink over whether the routes of the Taiping troops were random during the 183 months. Intuitively the rebels would firstly attack the most prosperous regions for resources, but the facts greatly deviate from this idea considering the complex geographical and political conditions. Here I provide three clarifications about the randomness of the Taiping marching routes.

The first is that the Taiping routes dynamically interacted with both the Qing defence system and the quality and characters of local magistrates and military officers; such factors had no relationship with local economic conditions. For example, all Middle Yangzi provincial capitals, Changsha, Wuchang, Nanchang and Anqing, were regional economic centres by the Yangzi River with very dense water and land transport networks. However, due to the varying capacities of the local Qing troops, these four prefectures had completely different endings. In 1852 Changsha was under intense attack from the main Taiping force for three months but it never fell into the hands of the Taipings because of its tenacious local soldiers (CMH, 2003), and for the years after 1853 Changsha was never disturbed by the Taiping forces (Luo, 1937). There was a similar story for Nanchang: the tough Qing troops fought for three months and suffered huge loss of resource and population but Nanchang never fell; after the Western Expedition, even when the entire Jiangxi was under the Taiping rule, Nanchang was still at the Qing's hands (Guo, 1989). As a comparison Wuchang had no such good luck. At the end of 1852 the officers of Yuezhou, a place in the upper reaches of Wuchang (indicated in Figure A.4), abandoned the town and escaped; the Taipings quickly sailed down the River without a battle and left no time for Wuchang to defend (FHAC, 1996). Wuchang soon fell in early 1853 and its surrounding regions were occupied by the Taipings from time to time for the next years. Besides, the downstream Anqing's story was the most miserable. Due to the slow local response, the city was occupied, the governor was killed (FHAC, 1996) and Anqing became one of the most devastated regions by the Taiping forces for eight consecutive years. The cases of the above four Yangzi provincial capitals imply that the Taiping impact was highly unpredictable and showed weak link to the economic status of the prefectures.

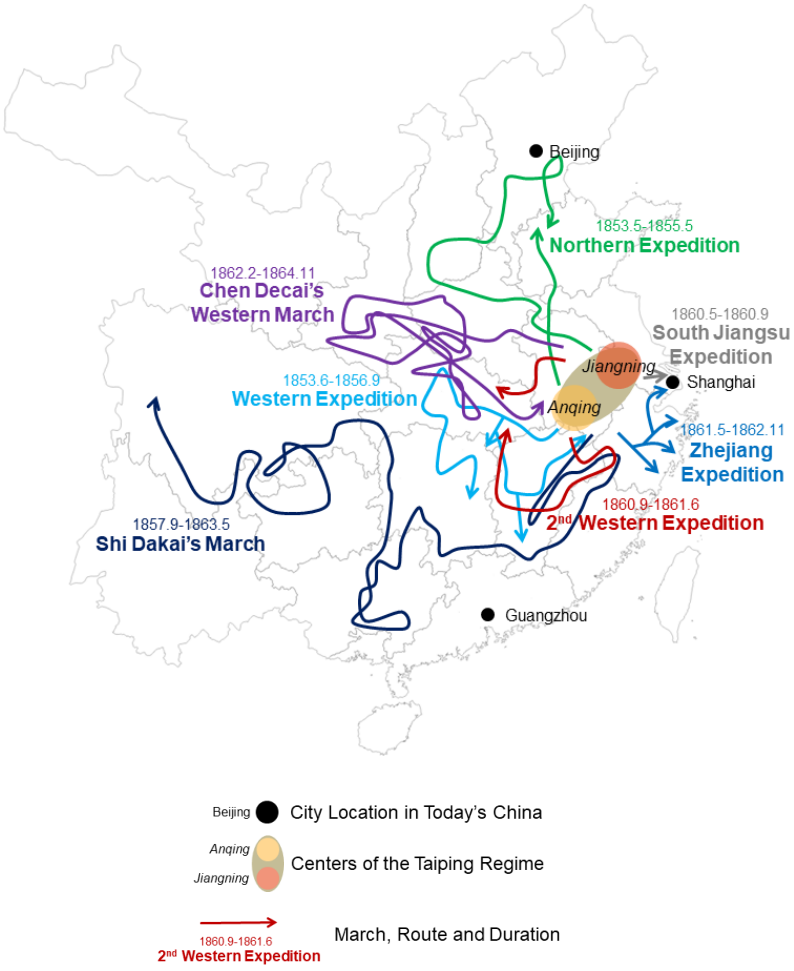
Figure A.4. Randomness of the Taiping Impacts in the Middle Yangzi Region



Source: see the text.

The second clarification for the randomness of the Rebellion is that the Taiping expansion strategies were shaped by its own political conditions and the characters of its kings and generals. Figure A.5 provides details on the long marches of the Taiping troops. For example, the successful Western Expedition starting from 1853 won the vast and prosperous Middle Yangzi regions for the Taipings. However, the Tianjing Incident, with self-weakening power division and bloody massacres in 1856, completely stagnated the actions of the front lines. Thousands of soldiers were recalled. The Taiping regime almost immediately lost its best opportunity of expansion, and its Hubei and Jiangxi territories were soon retaken by the Qing side. This political event was surely unanticipated and exogenous to the indirect taxation that I study. Another powerful piece of evidence is the Shi Dakai's March from 1857. After the power struggle with the founder Hong Xiuquan, the King Shi Dakai broke up with Hong, left the capital with several thousand subordinates and marched westward. Through the long march Shi avoided direct conflicts with both the Qing forces and other rebellious groups in southern China such as the Heaven and Earth Society (Tiandihui, 天地会) in Guangxi, making the route more uncertain and unpredictable.

Figure A.5. Long Marches of the Taiping Troops



Note:

1. The provincial borders are by CHGIS (Version 6) by Harvard University.

Source: Guo (1989); FHAC (1996).

The last clarification is that the Taiping impact on a prefecture was linked to the resource endowments and geographical conditions that had no connection to local economy. For example in Panel A of Figure A.6, in the winter of 1852 the main Taiping force abandoned attacking Changsha after a failed three-month siege and marched north to the Dongting Lake, one of the largest lakes in southern China. There were two equally important economic centres to the east and west of the Lake, Yuezhou and Changde respectively. The Taipings planned to march towards Changde along the side of the Lake; however, the boatmen at the Linzi Port donated several thousand boats to the Taiping forces. Hence they changed the plan, quickly sailed across the Lake to the east and conquered Yuezhou instantly. On the contrary, the prefectures to the west of the Dongting Lake, like Changde and Lizhou, were hardly ever disturbed and served one of the few Qing enclaves in the Middle Yangzi regions during the heyday of the Taiping regime. This example indicates how the accidental factors determined the routes while they had no relationship with economic activities.

Another illustration is from the Yellow River in northern China. During the Northern Expedition in 1853 the Taiping troops passed the border between Anhui and Henan and marched along the south bank of the Yellow River. Battles were recorded in Guide and Kaifeng prefectures. However, the Taipings found coal ships by accident in Gongxian[34] and thus crossed the River to conquer the north bank. Thus Gongxian became a pivot: in the south bank of the River, the prefectures to the west of Gongxian, such as Henan and Shaanzhou, were not disturbed at all; in the north bank for a comparison, with Gongxian as a cutoff, prefectures to the east like Weihui and Caozhou were not impacted while there were fierce sieges in the ones to the west, like Huaiqing and Pingyang. However, there is no evidence to imply a systemic difference in economic performance among these cohorts of prefectures with Gongxian as a pivot. See Panel B of Figure A.6.

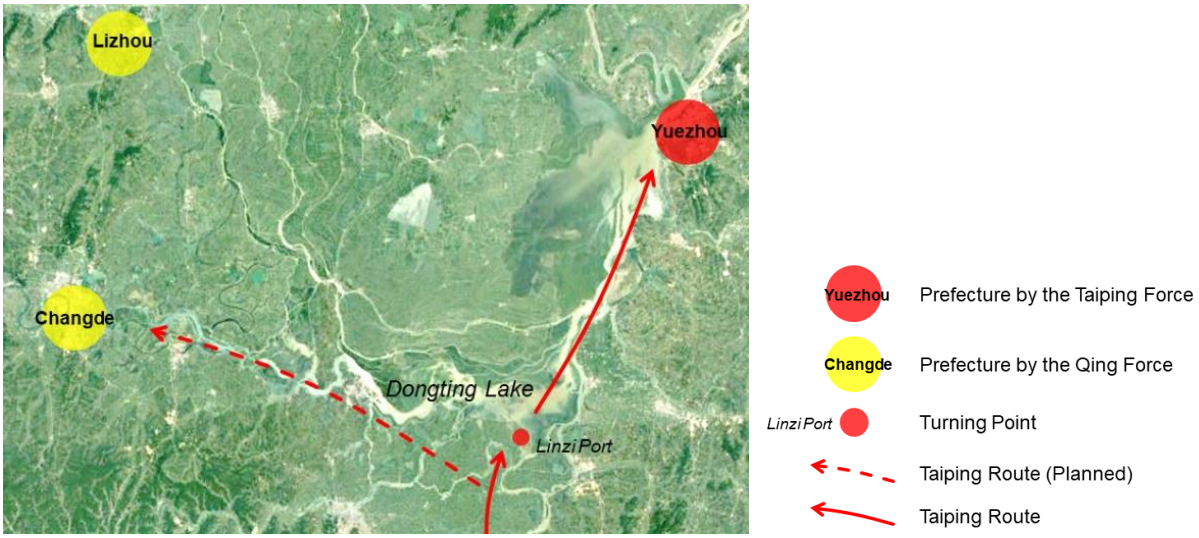
In short, rich qualitative evidence show that the Taiping shock was exogenous to the fiscal transitions that I focus on. Furthermore, with the prefectural dataset that this article establishes, I can check the randomness of the Rebellion from the following Poisson, logistic and OLS regressions in Table A.1. The dependent variables are different measures of the Taiping impacts, and the independent variables include the pre-Rebellion geographical, political and economic conditions. No factors can robustly explain the prefectural Taiping impact.

Meanwhile I count the monthly battles from 1853 to 1864 and construct count variables, *Taiping Duration (Jan.1853-Dec.1854)*, *Taiping Duration (Jan.1855-Dec.1856)*, etc. for each prefecture; then I use Poisson regressions to check whether the intensity of the earlier Taiping battles could predict the ones in years later. For all 15 regressions in Table A.2 I add province dummies. The early Taiping warfare in general cannot predict the warfare severity in later phases.

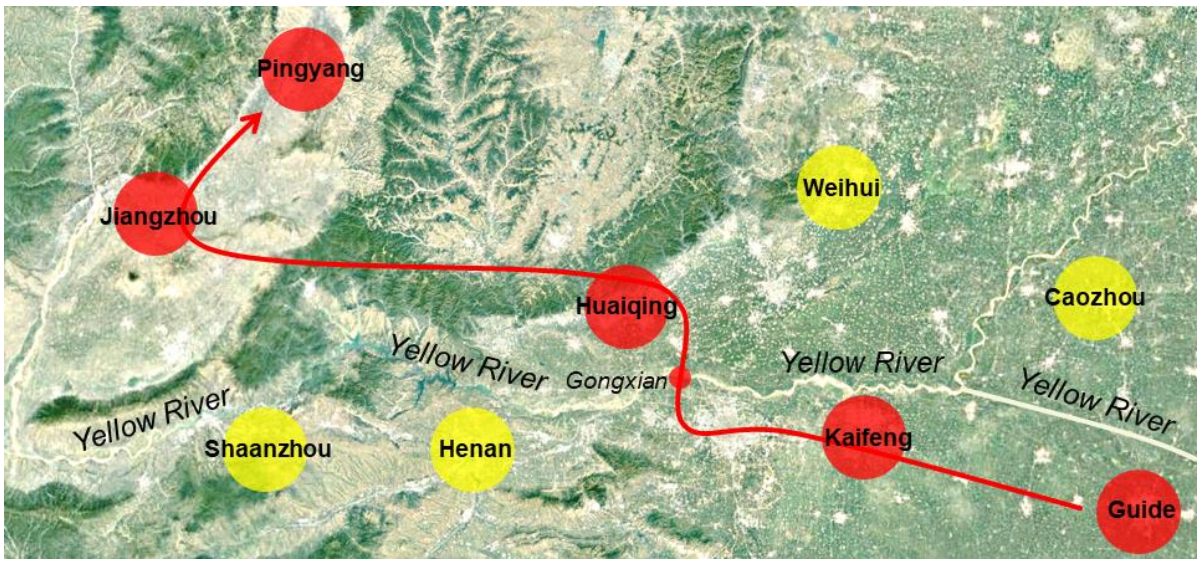
[34] This is a county in Henan prefecture of Henan province.

Figure A.6. Randomness of the Taiping Impacts by the Dongting Lake and Yellow River

Panel A. Dongting Lake



Panel B. Yellow River



Source: see the text.

Table A.1. Initial Conditions and the Taiping Rebellion

Dependent Variable	Poisson *Taiping Duration 1850-56*	Poisson *Taiping Duration 1857-60*	Poisson *Taiping Duration 1861-64*	Logistic *Taiping Dummy 1*	Logistic *Taiping Dummy 2*	OLS *Taiping Duration*	OLS *Taiping Severity*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
Ln(Size)	-0.424	0.362	-0.243	0.203	-0.635	0.472*	0.028
	(0.535)	(0.486)	(0.217)	(0.290)	(0.506)	(0.257)	(0.020)
Coast	-1.303***	-1.308**	-0.982*	-4.158***	-2.774***	-1.856	-0.053
	(0.466)	(0.643)	(0.590)	(1.074)	(0.746)	(1.211)	(0.099)
River	1.330	0.199	0.531*	2.189**	3.240**	1.835**	0.126**
	(0.895)	(0.657)	(0.306)	(1.113)	(1.502)	(0.818)	(0.049)
Latitude	-0.119	-0.153	-0.485***	-0.545**	-0.382	-0.201	-0.010
	(0.153)	(0.171)	(0.141)	(0.247)	(0.237)	(0.156)	(0.012)
Longitude	-0.044	-0.107	-0.102	-0.180	-0.148	0.085	0.005
	(0.217)	(0.179)	(0.146)	(0.283)	(0.212)	(0.174)	(0.011)
Ln(1820	1.009**	0.506	0.915***	0.752	1.638**	0.331	-0.001
Population)	(0.514)	(0.315)	(0.321)	(0.507)	(0.788)	(0.323)	(0.025)
Political	-0.004***	-0.004**	-0.002	0.001	0.004	-0.005	-0.000*
Control	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.000)
Distance to	-0.002	0.003**	-0.002	-0.006*	-0.007**	-0.001	-0.000
a Custom	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)	(0.000)
1820 Land	-0.001	-0.000	-0.000	0.005***	0.003	0.002	0.000
Tax Rev.	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.001)	(0.000)
Other Rebellions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	4.320	10.809	24.106	32.973	21.056	-5.566	-0.228
	(25.422)	(22.708)	(20.855)	(31.174)	(24.741)	(20.051)	(1.123)
Obs.	266	266	266	266	266	266	266
R-squared	-	-	-	0.446	0.508	0.537	0.362

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2; For logistic regressions, I report the **pseudo** R^2.

The 'other rebellions' include White Lotus Rebellion, Tiandihui Rebellion and Xiaodaohui Rebellion. The dummy for the 1st Opium War is added, too.

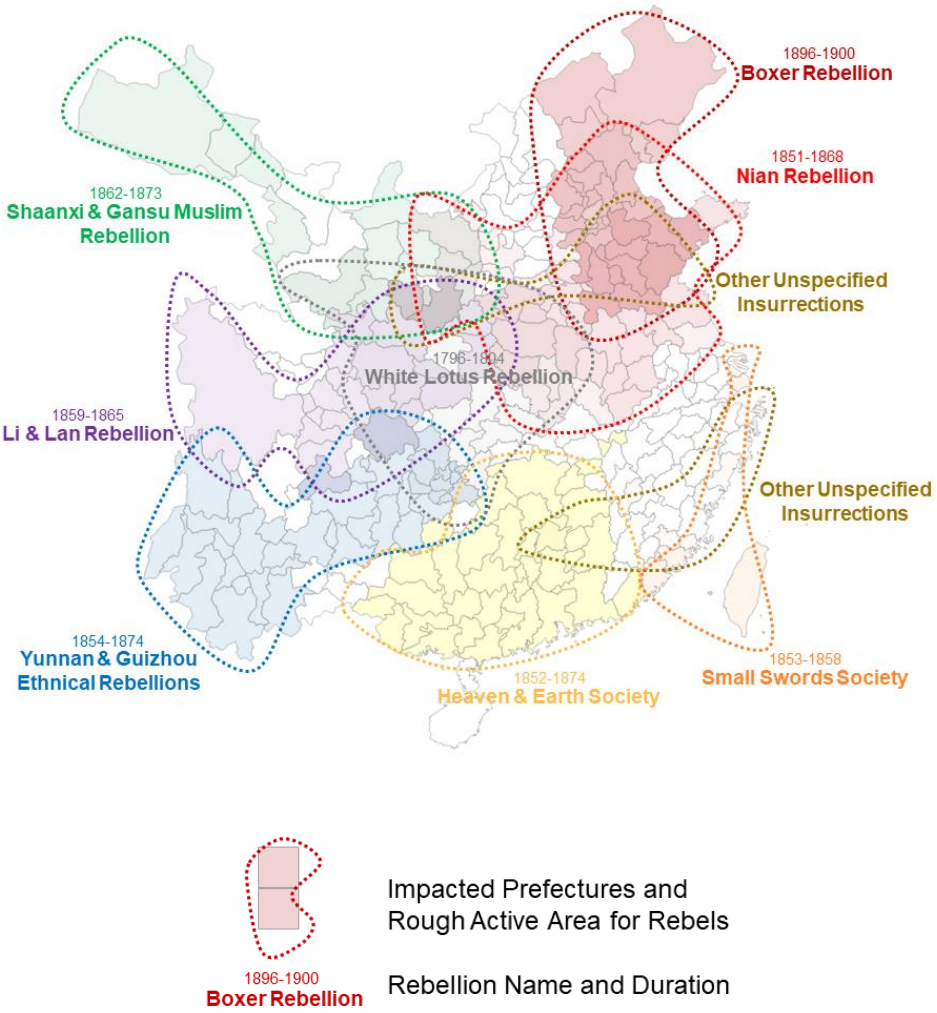
Table A.2. The Impact of the Taiping Rebellion by Years

		Poisson				
		Key Independent Variable				
		Taiping Duration 1853-54	*Taiping Duration 1855-56*	*Taiping Duration 1857-58*	*Taiping Duration 1859-60*	*Taiping Duration 1861-62*
Dependent Variable	*Taiping Duration 1855-56*	*(1)* 0.374*** (0.038)				
	Taiping Duration 1857-58	*(2)* -0.001 (0.208)	*(6)* 0.360*** (0.108)			
	Taiping Duration 1859-60	*(3)* 0.136 (0.129)	*(7)* -0.063 (0.237)	*(10)* -0.383 (0.310)		
	Taiping Duration 1861-62	*(4)* 0.173*** (0.050)	*(8)* 0.135*** (0.025)	*(11)* 0.213** (0.095)	*(13)* 0.453** (0.223)	
	Taiping Duration 1863-64	*(5)* 0.091 (0.147)	*(9)* -0.085 (0.082)	*(12)* 0.144 (0.346)	*(14)* 0.523*** (0.121)	*(15)* 0.045 (0.134)

The entries are corresponding coefficients for key independent variables. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For all 15 regressions I add province dummies. The coefficients for province dummies and constant are not presented.

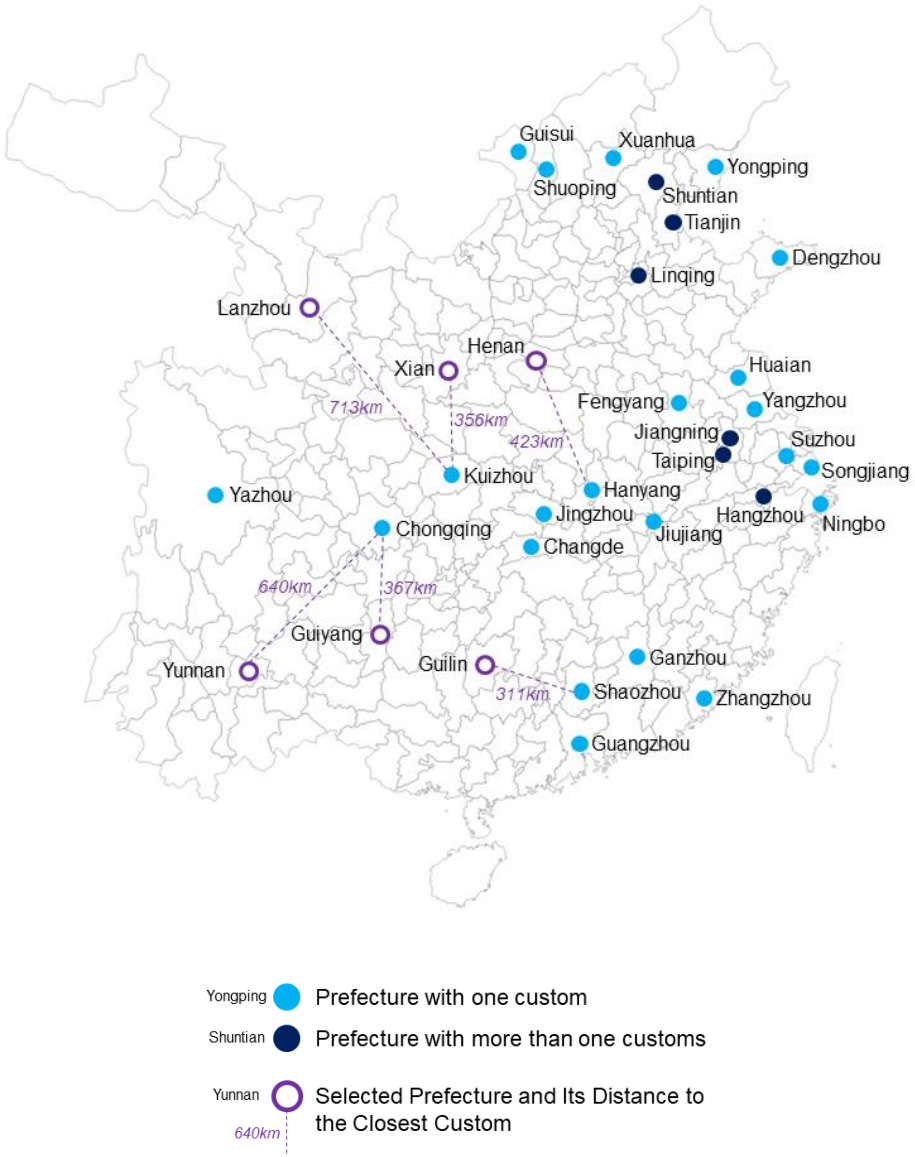
C. Additional Tables and Figures

Figure A.7. Spatial Distribution of Other Large-Scale Rebellions in the Late Qing China



Source: see Table 2.

Figure A.8. Spatial Distribution of the Qing Domestic Customs



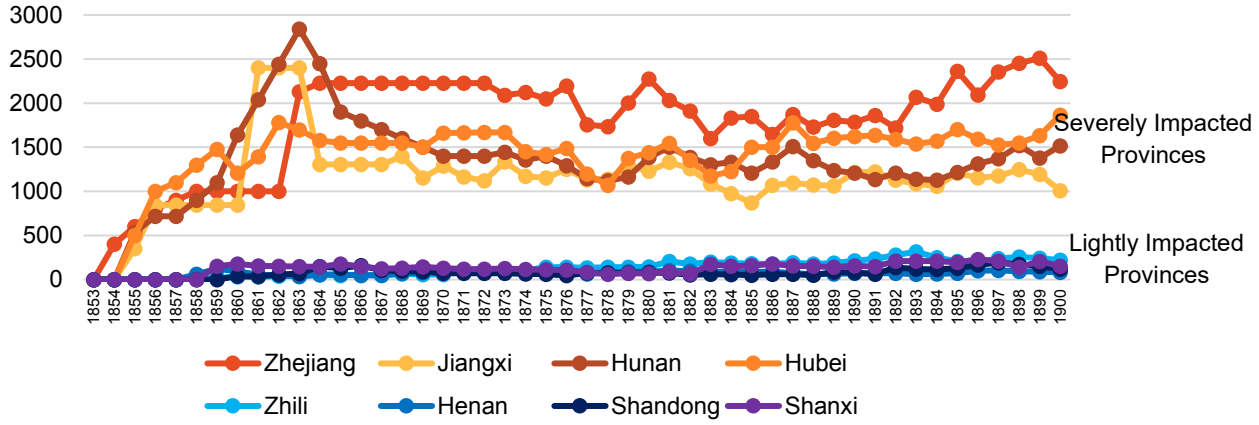
Notes:

1. This figure plots the locations of customs and then it measures the distances from the provincial capitals of Gansu, Shaanxi, Henan, Yunnan, Guizhou and Guilin, to their nearest customs. All these six provinces had no customs within their territories.
2. The distances in the map are calculated by the ARCGIS.

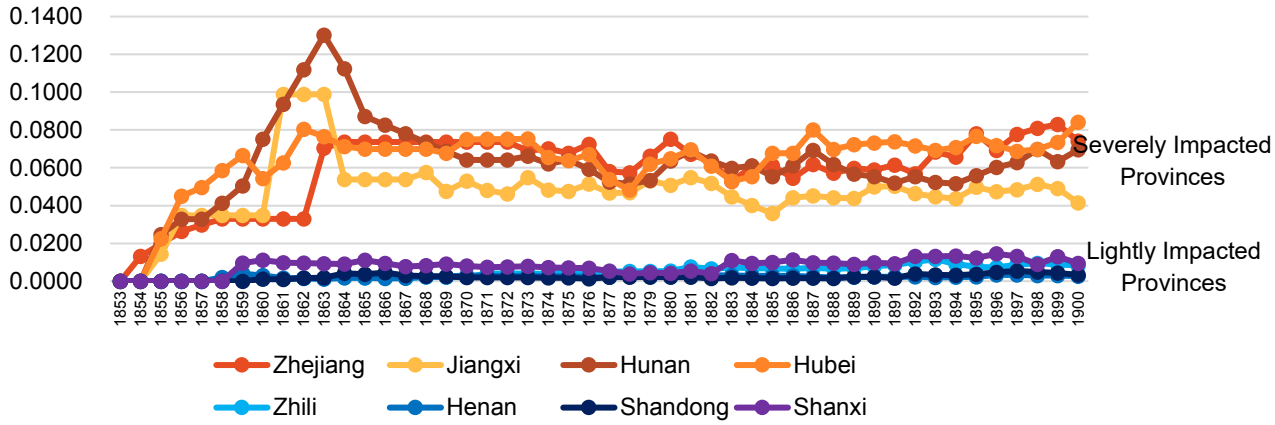
Source: see Table 2.

Figure A.9. Selected Yearly Annual Lijin Revenue at the Provincial Level

Panel A. Selected Yearly Lijin Revenue for Provinces (in 10^3 silver taels)



Panel B. Selected Yearly Lijin Revenue Per Capita for Provinces (in silver taels p. c.)



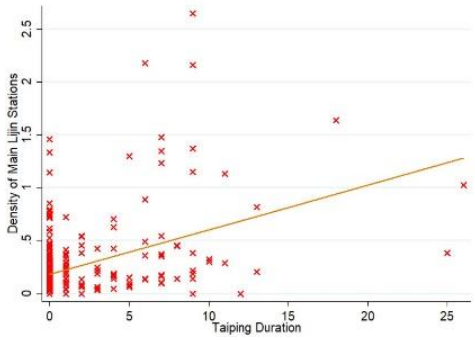
Note:

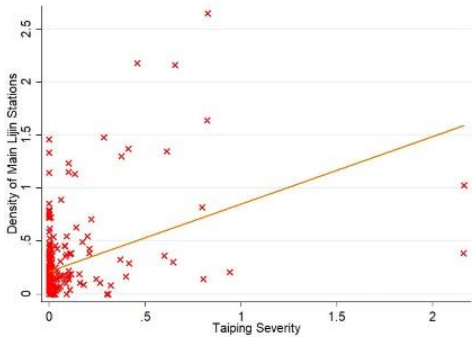
1. Considering the currencies reform and price volatility during the New Policy Decade (1900s) these figures only cover 1853 to 1900.
2. Panel B uses 1851 population data by Cao (2001) to generate per capita data. If we consider the population changes from 1851 to 1900, the gap between severely and lightly impacted groups in Panel B should be wider.

Source: Cao (2001); Zhou (2011).

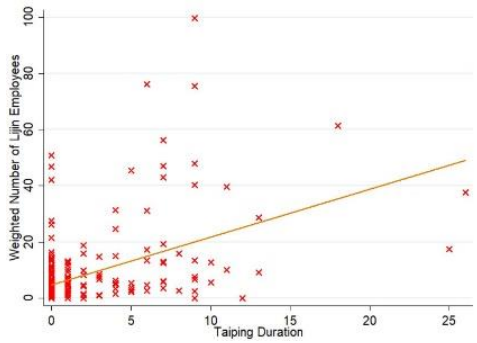
Figure A.10. Scattered Plots for the Lijin Taxation to the Taiping Rebellion (266 Prefectures)

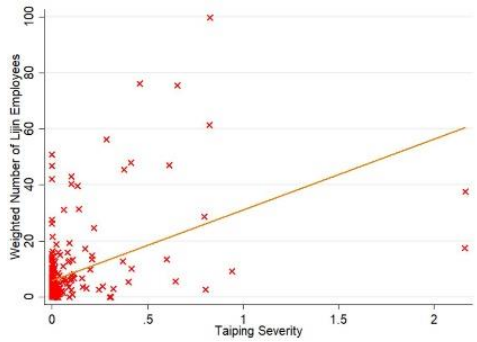
Panel A. Density of Main Stations



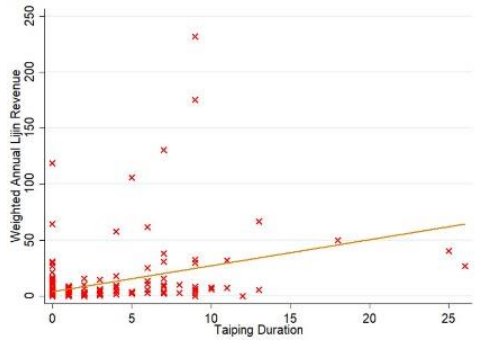


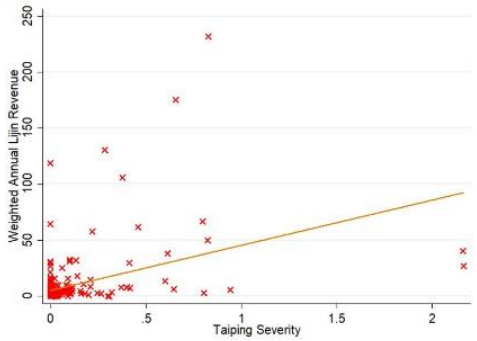
Panel B. Weighted Number of Employees





Panel C. Weighted Annual Revenue

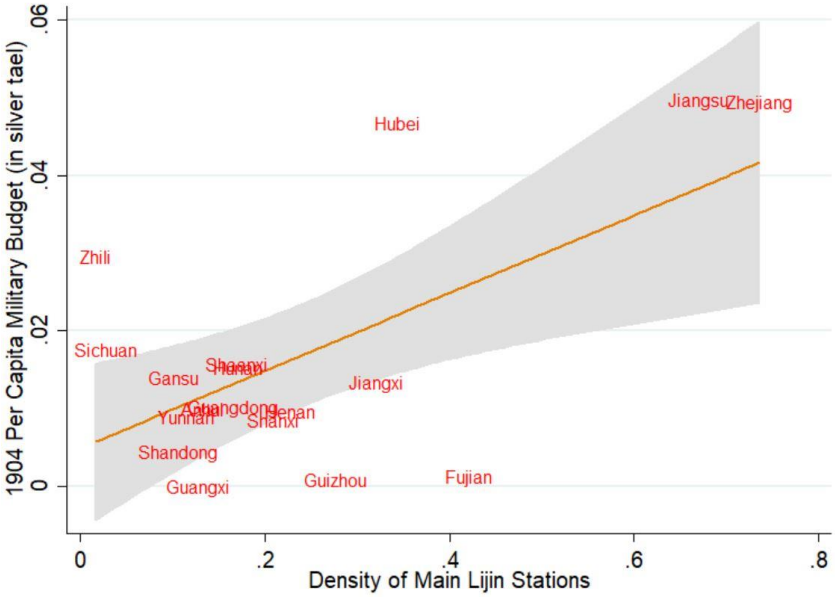




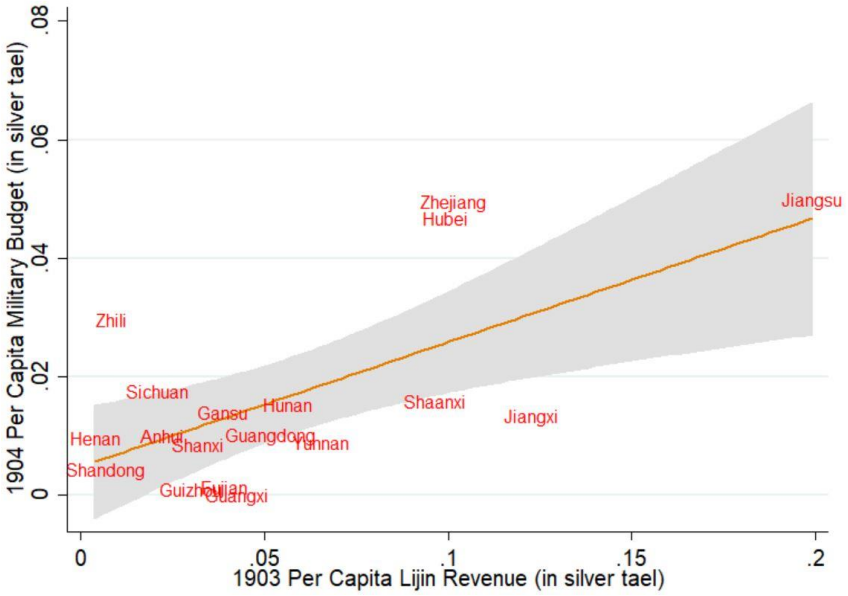
Source: see Table 1.

Figure A.11. Scattered Plots for the 1904 Military Budget to the Lijin Taxation (18 Provinces)

Panel A. Military Budget and Density of Lijin Stations



Panel B. Military Budget and Weighted Annual Lijin Revenue



Notes:

1. I use 1910 population data (Cao, 2001) to generate above per capita data.
2. The grey band represents the 95% confident interval.

Source: see the text, Table 1 and Zhou (2000).

Table A.3. Types of the Lijin Bureaus and Stations

Name	Provincial Bureau (省局)	Main Station (正卡)	Additional Station (分卡)
Level	High	Middle	Low
Responsibility	General supervision	Tax collection	Tax collection and inspection
Number of Employees for Each	Hunan: 39 Jiangsu (Suzhou Div.): 24 (plus 16 runners) Jiangsu (Shanghai Div.): 28 (plus 20 runners) Shandong: 28 (plus 20 runners)	Shanghai Freight: 76 Wusongjiang: 32 Minhang: 31 Wuku: 21 Yanjiaqiao: 21 Liuhe: 36 Shashi: 22 Hukou: 56 Ertaokou: 44	Wusongjiang, Minhang, Wuku and Yanjiaqiao: 4 for each Liuhe: 5 for each Shashi: averagely 2.6 for each Ertaokou: averagely 11 for each

Note:

1. The Shanghai Freight Station had 76 employees as it was set by a key railway junction.

Source: Luo (1936); BL (2006).

Table A.4. Descriptive Statistics

Category	Variable	Obs.	Mean	SD	Min	Med	Max
Key Independent Variables	*Taiping Dummy 1*	266	0.538	0.500	0	1	1
	Taiping Dummy 2	266	0.368	0.483	0	0	1
	Taiping Duration	266	1.835	3.720	0	0	26
	Taiping Severity	266	0.076	0.238	0.000	0.002	2.163
Dependent Variables	*Number of Main Lijin Stations*	266	2.801	3.316	0	2	20
	Number of Lijin Employees	266	79.722	116.212	0	36	730
	Annual Lijin Revenue	266	71.150	145.552	0	19	966
Control Variables	*Land Size*	266	16148	19407	1270	12140	192200
	Coast	266	0.135	0.343	0	0	1
	River	266	0.184	0.388	0	0	1
	Latitude	266	30.745	5.084	19	31	43
	Longitude	266	111.580	5.872	95	112	122
	Population 1820	266	1411	1242	18	999	6663
	Population 1851	266	1603	1415	22	1128	7981
	Population 1880	266	1319	1251	27	929	6847
	Population 1910	266	1545	1416	33	1121	7577
	Political Control	266	191.621	114.097	0	187	914
	Distance to a Custom	266	261.715	213.013	0	205	1151
	Treaty Port Duration	266	4.282	13.259	0	0	68
	Nian Reb. (Former)	266	0.117	0.321	0	0	1
	Nian Reb. (Latter)	266	0.117	0.321	0	0	1
	Tiandihui Rebellion	266	0.135	0.343	0	0	1
	Xiaodaohui Rebellion	266	0.019	0.136	0	0	1
	Southwestern Ethnic Reb.	266	0.143	0.351	0	0	1
	Lilan Rebellion	266	0.090	0.287	0	0	1
	Northwestern Ethnic Reb.	266	0.064	0.245	0	0	1
	Boxer Rebellion	266	0.117	0.321	0	0	1
	1st Opium War	266	0.030	0.171	0	0	1
	2nd Opium War	266	0.026	0.160	0	0	1
	Sino-French War	266	0.019	0.136	0	0	1
	Sino-Japanese War	266	0.015	0.122	0	0	1
	Natural Disaster Severity	266	46.083	11.218	26	44	69
	1820 Land Tax Revenue	266	185.524	305.623	0	90	3056
	Number of Industrial Firms	266	4.267	18.968	0	0	247
	Number of Provincial Parliament (Ziyiju) Representatives	266	6.474	5.723	0	5	39

Note:

1. In this table I report the counts for many variables but in the regressions I may employ the density or the weighted number for them. Check the calculating methods in Tables 1 and 2.

Source: see Tables 1 and 2.

Table A.5. Post-Rebellion Economic Conditions and Lijin Taxation

Dependent Variable	OLS *Density of Main Lijin Stations*			
	(1)	*(2)*	*(3)*	*(4)*
1880 Population Density	1.739**	1.254***		
	(0.640)	(0.312)		
1910 Population Density			1.480**	0.910***
			(0.577)	(0.261)
Ln(Size)		-0.080		-0.092*
		(0.051)		(0.051)
Coast		0.061		0.088
		(0.131)		(0.127)
River		0.131*		0.145**
		(0.066)		(0.066)
Latitude		0.011**		0.011**
		(0.005)		(0.005)
Ln(1820		0.053		0.061*
Population)		(0.031)		(0.031)
Political		-0.000**		-0.000**
Control		(0.000)		(0.000)
Distance to		0.000		0.000
a Custom		(0.000)		(0.000)
Treaty Port		0.006***		0.006***
Duration		(0.002)		(0.002)
Other Rebellions		Yes		Yes
Constant	0.065	0.297	0.066	0.359
	(0.050)	0.358	(0.051)	(0.365)
Obs.	266	266	266	266
R-squared	0.240	0.607	0.212	0.594

The entries are corresponding coefficients. **Robust** standard errors, **clustered** by province, are reported in parentheses. The *, ** and *** denote statistical significance at 10%, 5% and 1% level. For OLS estimates, I report the **adjusted** R^2.

The 'other rebellions' include Nian Rebellions (former and latter stages), Tiandihui Rebellion, Xiaodaohui Rebellion, Southwestern Ethnic Rebellion, Lilan Rebellion, Northwestern Ethnic Rebellion and Boxer Rebellion.