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# Competence-loyalty tradeoff under dominant minority rule: The case of Manchu rule, 1650-1911 <sup>☆</sup>

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## ABSTRACT

This paper examines how a million Manchus, as a dominant minority, partly relied on a cross-ethnic personnel strategy to rule over 100 million Han Chinese for 267 years. Under this strategy, Han elites were appointed to handle daily administrative issues, on top of whom Manchu superiors were assigned for oversight. We find that more frequent local extreme weather – a proxy for governance complexity – led to higher likelihood of such cross-ethnic arrangements. This link is stronger in regions where Han elites accumulated more discretionary power. Moreover, the cross-ethnic strategy was associated with better local economic development, more efficient policy execution, and enhanced recognition of imperial authority.

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## 1. Introduction

Throughout history, countries were often ruled by dominant minorities who were racially, religiously, or ethnically different

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from the ruled majority. Examples include the Greek rule over the Indo-Greek Kingdom (Banerjee, 1961; Avari, 2007), and the Mongol and the Manchu rule over Han China (Sun, 2011; Duan, 2012).<sup>1</sup> The rule by dominant minorities had profound and long-lasting impacts on the governed regions (Michalopoulos and Papaioannou, 2016), and remains relevant for the modern world, with the Alawite ruling Syria, the Tutsis ruling Burundi, the North Arabs ruling Yemen, and the Sunni Muslims ruled Iraq under Hussein. Due to their limited population, effective control and governance become crucial challenges for ruling minorities. Limited by their relatively small talent pool, the dominant minority has to balance two motives: on one hand, they need to motivate the majority elites to provide order, public goods, or at least

<sup>1</sup> A related concept of the dominant minority rule is the colonial rule. Despite the possible intersection, there are two major distinctions between the two scenarios. First, the dominant minority are often long-time co-habitants or neighbors with the majority group as the Sunni and Shia Muslims, or as the Manchus and the Hans, while colonists often come as complete foreigners. Second, the colonists might turn into the dominant majority if the colonists deemed the local conditions desirable, as in the cases of Australia and the United States (Acemoglu et al., 2012).

tax revenues; on the other hand, they need to control the majority elites from challenging their hold on power. The second motive becomes critical when the dominant minority lack local information and thus have to delegate substantial power to the majority elites. The tension and the dynamics attract continuous scholarly attention with detailed case studies and narrative descriptions (e.g., Haklai, 2007; Fearon et al., 2007; Kohli, 2019; Paine, 2019).<sup>2</sup> However, the literature is short of a comprehensive empirical analysis on systematic ruling strategies adopted by the dominant minority and evaluations of their efficacy. In this paper, we use almost three centuries of experience in Qing dynasty China to examine the ethnic-based assignment strategy in local leadership.

The history of the Qing dynasty represents a classic example of how a ruling minority effectively governed a majority population of different ethnicity. The Manchus, an ethnic minority in northeastern China, overthrew the Ming dynasty in 1644, established the Qing dynasty, and ruled China until 1911. The ruling tasks were beyond challenging: the fewer than a million Manchus had to govern a population of more than 100 million – mostly Han Chinese. Constrained by the limited Manchu elite pool, delegation of power to the Han officials was inevitable for Manchu rulers. The efficacy of such delegation was demonstrated by the longevity of the rule,<sup>3</sup> the growth of population, and the regime's shares in the world economy.<sup>4</sup> Yet the delegation to Han Chinese officials entailed significant loyalty concerns: Competent native officials could have too much discretionary power, thus undermining the authority of the Manchus (Jiang, 1980). Such concerns were made evident in Emperor Kangxi's edict, "(the Han Chinese) do not share my trust" (Yang, 1986).

To ease such concerns, Manchu rulers adopted an ethnicity-based delegation strategy in response to localized governing needs. In a province with complex ruling challenges such as frequent insurgencies (Xie, 2006), Manchu rulers often delegated to Han governors (*xunfu*), and utilized their superior local knowledge and networks to handle daily administrative issues (Xi, 2019). On top of the delegation, the rulers sometimes appointed a Manchu official as a viceroy (*zongdu*), the leading regional official overseeing two or more provinces, to ensure the loyalty of the Han governors (Ye, 1996, 1996; Du, 2009). We refer to such cross-ethnic assignments as *Manchu-Han duos*. An example is that Zhang Boxing, a Han elite, served as the governor of Jiangsu province in 1711, while his superior officer was Gali, a Manchu viceroy of Liangjiang that oversaw three provinces: Jiangsu, Anhui, and Jiangxi. There is suggestive evidence that the viceroy-governor duos were designed for supervision and monitoring, as shown in various royal edicts.<sup>5</sup> Moreover, the Manchu rulers often reminded

their fellow Manchu viceroys of their monitoring duties over Han governors, as seen, for instance, in the correspondence between Emperor Kangxi and Asan, a Manchu Viceroy of Liangjiang in 1702 (Guan et al., 1996, p.275).

Despite historical records of such Manchu-Han duos, two questions remain unclear. First, did the Manchu rulers appoint the Manchu-Han duos systematically? Second, did the Manchu-Han duos indeed facilitate loyalty from Han officials to the Manchu rulers? Since utilizing local knowledge is more important when regional governance tasks are more complex, the Manchu rulers often had to appoint Han governors during these challenging times to utilize their talents. And then, out of loyalty concerns, the rulers had to appoint Manchu viceroys to supervise the Han elites. Therefore, we hypothesize that the regions featuring more complex governance tasks would be more likely to be led by Manchu-Han duos to ensure both efficiency in governance and loyalty to the Manchu rulers.

To test the hypothesis, from a number of historical sources, we construct an original panel dataset of top Qing local officials of 425 viceroys and 1,020 governors during 1650–1911. In addition, we collect information on the occurrence of extreme weather in the regions during the same period. We show that extreme weather was closely related to economic shocks proxied by local grain price fluctuations and political shocks proxied by local peasant revolts. We thus use the occurrence of extreme weather as a proxy for local governance complexity. Our baseline regression results suggest that the Manchu central government was more likely to adopt a Manchu-Han viceroy-governor arrangement when governance was more complex. The result remains robust after controlling for the local population, human capital, and the adoption of new technologies. Our hypothesis is further strengthened in provincial official turnovers: a province was more likely to switch from same-ethnic duos to Manchu-Han duos when it suffered more extreme weather. Moreover, if the local governor was already a Han elite, the Manchu ruler tended to replace his fellow Han viceroy with a Manchu viceroy during hard times to strengthen supervision.

Furthermore, we explore the temporal and regional heterogeneity in the assignment, and find that Manchu-Han duos were more likely in provinces geographically more distant from the central authority – thus featuring more substantial loyalty concerns, and in the declining years of the dynasty when the central authority's control was weaker. In addition, the Manchu rulers did not rely on trusted officials from neighboring provinces for local supervision. Therefore, monitoring happened mainly vertically instead of horizontally within the bureaucratic hierarchy. All results are consistent with the cross-ethnic Manchu-Han viceroy-governor assignment as a calibrated personnel response to high governance complexity.

Lastly, we investigate the efficacy of ethnicity-based governing strategies and find them effective. We first provide an overall evaluation of the impact of Manchu-Han duos on local economic development, and show that regions under the cross-ethnic duo arrangement had significantly higher subsequent population density. Next, we show that regions under more extended periods of Manchu-Han duos leadership were more proactive in implementing central-initiated reforms, and requested fewer fiscal reliefs – both indicating higher execution efficiency. Moreover, we show that in the turbulent late Qing dynasty, regions with longer ruling history under Manchu-Han duos had more self-financed militia to maintain social order and support the imperial court, exhibited a lower willingness to defy central authority in the Yangtze Compact, and were more reluctant to declare independence after the Wuchang

<sup>2</sup> Oded (2007) devises a conceptual framework for the analysis of continuous ethnic minority rule over hostile majorities, and uses the case of Syria to analyze how the minority utilized military forces to decrease the saliency of distinct identities. Paine (2019) shows how the minority European elites managed to rule over African colonies through repression, which in turn led to more frequent conflicts. Fearon et al. (2007), meanwhile, underscore the increasing tendency towards civil wars under ruling minorities.

<sup>3</sup> The Qing dynasty lasted for 267 years. Over the history of Imperial China, only two dynasties had comparable reigns to the Qing dynasty: the Ming dynasty survived 276 years; the Tang dynasty, 289 years.

<sup>4</sup> The population growth in the Qing dynasty more than doubled that in the Ming dynasty (0.70% vs 0.32%, see Gong, 2002; Li et al., 2018). The Qing-dynasty economy claimed 32.9% of the world GDP (Maddison, 2001), and the economy was resilient during several recessions (Li, 2017).

<sup>5</sup> See: *Qing Shilu, Records of Emperor Kangxi*, Vol. 30, p. 17.

Uprising – all pointing to enhanced imperial loyalty under Manchu-Han duos leadership.<sup>6</sup>

Our paper makes four contributions. First and foremost, we contribute to the literature on the tradeoff between direct and indirect governance. Direct governance refers to the direct control of the legislature and executive branches by the rulers (Iyer, 2010), while indirect governance refers to the delegation of specific political responsibilities to local intermediaries (Padró I Miquel and Yared, 2012). Similar to the Manchu rulers, colonists often relied on delegations to rule (Scott, 2009), whose governance structures varied with geographic features (Acemoglu et al., 2001, 2002; Fearon and Laitin, 2003; Nunn and Puga, 2012), agricultural output (Callen et al., 2018), and the costs of suppressing resurgences (Berman et al., 2011).<sup>7</sup> We join the discussion by offering a first set of evidence that cross-ethnic office appointments were adopted as a systematic strategy towards the challenge—by appointing majority-ethnic-group elites for efficiency and minority elites for monitoring. We further differ in the context: traditionally, indirect governance was used when the conquerors had more advanced technology and state capacity. In our context, elites from the conquered possessed more advanced technology and state capacity, thus highlighting concerns of interest alignment (Leffler and Legro, 2008; Sierra et al., 2019). We show that in such contexts, the cross-ethnic personnel arrangement appears to be a workable organizational design.

Second, and relatedly, our paper contributes to the recent literature emphasizing the hearts and minds initiatives by the conquerors, which are found to be usually more effective in eliciting local information (Kalyvas, 2006), and in reducing the probabilities of local insurgence (Berman et al., 2011; Dell and Querubin, 2018). The appointment of Han elites to local administrative offices is a classic move to utilize their local knowledge and access to the existing capacity of the dominant ethnicity's network. Our paper also emphasizes the complementary part of the strategy – the importance of assigning trustworthy supervisors to ensure the loyalty of competent administrative officials.

Thirdly, our paper adds to the literature on leadership selection processes in China. Existing studies on leadership selection in China are mainly contemporary, to investigate the logic of performance-based incentives (Maskin et al., 2000; Li and Zhou, 2005), faction-based promotion (Shih et al., 2012; Fang et al., 2019), ability-based selection (Yao and Zhang, 2015), or the co-existence of performance and loyalty (Landry et al., 2014; Jia et al., 2015). Yet, as emphasized by Xu (2011) in his survey of China's institutions, China's modern institutions have inherited many

key features from millennia of Chinese history, of which the literature on official selection is thin. By extending the data coverage on leadership selection in China from decades to centuries, we substantially increase the signal-to-noise ratio, showing that pre-modern leadership selection processes offer much insight, such as the joint importance of competence and loyalty. The supervision role of viceroys over governors in provincial leadership also complements the discussions of bureaucratic redundancy (e.g., Ting, 2003), that multiple leadership positions serve the purpose of checks and balances.

Lastly, we contribute to the literature on the competence-loyalty tradeoff. The existing literature on governance highlights that the lack of local information encourages delegation to experts more familiar with local situations (Hayek, 1945; Aghion and Tirole, 1997; Huang et al., 2017). In the meantime, delegation calls for stricter supervision, otherwise the loyalty of delegated officials becomes a severe concern (Egorov and Sonin, 2011; Shih et al., 2012; Zahkarov, 2016). Unlike the cases of Iraq, Burundi, and Syria, where the positions granted to the majority elites had only ceremonial power, the Han governors in the Qing dynasty were appointed precisely because they were better at maintaining internal order. In this regard, a close paper to ours is Xi (2019), which described a “bright” picture of Qing rulers increasingly using Han talents as its rule became more challenging. This paper differs from Xi (2019) in three aspects. First, we shed light on a dark side of the picture that the Qing emperor did not trust Han talents who might accumulate discretionary power, thus becoming a threat to the imperial court. To solve the problem, the Manchu rulers used a loyal Manchu viceroy to monitor and supervise the Han governor. Second, we offer novel evidence that if the local governor was already a Han talent, the Manchu ruler tended to replace the fellow Han viceroy with a Manchu viceroy during hard times to strengthen supervision. Thus, this paper advances the logic of Manchu's regime survival on top of Xi (2019)'s contribution. Third, this paper validates the efficacy of the Manchu-Han duos and shows that this arrangement was associated with stronger stability, more taxes, and higher loyalty to the royal court. Furthermore, through centuries of historical studies of official selections in a stable authoritarian regime whose influence is still visible today, we show how the competence-loyalty tradeoff pendulum swings over time. In particular, when political survival is threatened and the majority elites become empowered, the competence-loyalty pendulum would switch to loyalty.

The remainder of the paper is organized as follows. The next section presents background information about the Manchus and their rule of China. Section 3 introduces the data. Section 4 provides the results. Section 5 discusses the efficacy of the Manchu-Han duo assignment strategy, and Section 6 concludes.

## 2. Background and hypothesis

The Manchus, a nomad population of less than a million, exercised effective governance over a vast empire of six million square kilometers with more than 100 million inhabitants of another ethnicity for nearly-three centuries. How was this accomplished? What governance structure did the Manchus use to sustain their long reign? How did Manchu rulers use Han elites for their rule? This section provides a historical background. We first provide a sketch of the Manchus, followed by the governance structure under the Manchu rule in the Qing Empire. Within the bureaucratic hierarchy, we focus on the ethnicity choice at the provincial leadership level, based on which we draw testable hypotheses for empirical analysis.

<sup>6</sup> The essence of the cross-ethnic bureaucrat assignment also had a persistent influence on the government styles in modern China. For instance, at the provincial level, the governance structure follows a dual-leadership approach, where a governor is responsible for local economic development, on top of whom a party secretary oversees major personnel decisions. The design that resembles the viceroy-governor duo in the Manchu Qing dynasty is believed to serve to alleviate the competence-loyalty tradeoff (e.g., Li, 2019). Furthermore, the cross-ethnic assignment of top leaders at various levels is also adopted in contemporary China, primarily in the autonomous regions of ethnic minorities. An autonomous region can be a county, a prefecture, and sometimes a province. In the counties and prefectures where the non-Han ethnic population are significant, one of the vice-leaders of the local governments are usually from the ethnic groups. According to the official decree, such arrangements serve to better respond to the needs of local ethnic populations (pp.24–25, Ma, 2004). Meanwhile, the leader is usually of Han ethnicity, to ensure the major policy implementation follows the lead of the central government. The cross-ethnic assignment thus accommodates both local information acquisition and central control, which corresponds nicely with the Manchu practice.

<sup>7</sup> The delegation, or the sharing of power, may go beyond the colonists and the local elites. Dube and Harish (2020) discuss that queens delegated power to their husbands to help the rule, while Francois et al. (2015) show that ethnic groups in Africa shared power according to their relative population.

## 2.1. The Manchus

The Manchus were an ethnic minority originating in north-eastern China that had resided there since the 13th century (during the late Yuan and the Ming dynasties), when the ethnic group was organized as typical nomad tribes. By the end of the 14th century, the total Manchu population was less than 20,000, compared to 65 million of the Ming Empire (Cao, 2000).

The main economic activities of the Manchu community were livestock raising and forestry of special products such as ginseng and mink. Short of agricultural technologies and skills, the Manchus lacked a stable agricultural sector to support necessities. Their wars with the Hans over time allowed them to learn from Han captives, who passed on technologies such as mining and weapon-making (i.e., bows and metal weapons). The Manchus became stronger militarily in a series of inter-tribal wars in the late 16th century. During the first fifteen years of the 17th century, Nurhaci, the founder of the Qing dynasty, established the strengthened Eight Banners System, which organized all households into hierarchical military and production units, with the largest unit called a *Banner*. The Manchus were thus transformed into a potent fighting force. Categorized by specific banners, male members were farmers in peacetime and soldiers in times of war. Distinctions were not made to separate civilian and military officials within a banner (Liu, 2020). The frequent fighting experience, much like the frequent fighting in European countries at similar periods – through means of improvement in weapons and learning by doing and organizational improvement – likely has greatly strengthened the state capacity of Manchus (North et al., 2009; Hoffman, 2015).

During the decades before they conquered the Ming Empire, the Manchus established many precedents that dealt with the use of the Han people for their purposes, and these precedents shaped their future strategies for conquest (Wakeman, 1985: 18–19). In 1618, Nurhaci and his Manchu soldiers attacked the troops under a Ming general, and induced him and his troops to surrender. The Ming general was kept his Ming rank and continued to lead his army under the Manchu leadership. This precedent – with every endeavor made to induce surrenders of Han armies and cities, and if without resistance, keeping the official rank of surrendered officials and generals—became standard practices. The Manchus also absorbed many Han scholar-advisors, who advertised on communication with the Hans, and often used the Confucian notion of heaven's mandate to convince the Hans of the legitimacy of the Manchu rule. Based on the Han retention strategy, the Manchus had a large Han army (“*Han Jun*”) who fought alongside the Manchu Banner-men. Indeed, it was the Han army with the most advanced weapons, the Portugal cannons China obtained and obtained from international trade.

In the mid-17th century, the Manchus, already militarily powerful and organized and at the urging of the Han advisors of the Manchu chief, began their “great enterprise”, by invading Beijing and beginning the conquest of China. Fully understood that their invasion could not succeed without the support of the Han Chinese, the Manchus exercised strong discipline to avoid harming non-soldier Han Chinese.<sup>8</sup> They also continued trying to induce surrender by promising Han generals the continuance of their ranks and by offering silvers and gold gifts. The Manchus conquered most of China in a few years, starting from 1643.<sup>9</sup>

<sup>8</sup> When conquering Southern China, that is, the most prosperous Jiangnan area, Manchus encountered strong resistance in several cities, and the Manchu army also committed some of the most atrocious slaughters in Chinese history. In the city of Yangzhou alone, 800,000 city residents were slaughtered (Wakeman, 1985: 563).

<sup>9</sup> The successful conquest was also partially due to the highly corrupt central regime in the late Ming dynasty. For a brief introduction of the Ming governance in its final days, please see Appendix B.

## 2.2. The Manchu governance over China

After the conquest, the Manchus implemented a rigorous governance system. The main challenge shifted to maintaining an effective rule over China, whose size and complexity was far greater than what the straightforward “Eight Banners System” could handle. The Ming Empire, by the time of the Manchu conquest, had 18 provinces, 302 prefectures, and 2,064 counties (Zhang, 1996). The Manchus largely took over the governmental structure of the Ming. As illustrated in Fig. 1, there were four administrative levels under the emperor (viceroys, governors, prefects, and magistrates) in the bureaucratic hierarchy. The central government consisted of 13 departments; the provincial government, seven departments. Officials had a total of 18 grades and 638 formal positions (Lv, 2015).

As an ethnical minority in China, the Manchus simply did not have the manpower and capacity to fill all the positions in the bureaucracy, and the Manchu leaders had to rely on indirect governance by the elite Han Chinese. The Han elites possessed superior information on how to govern local Han people, such as by connecting with local gentries who helped with collecting local taxes, or by having better information on potential local rebels and how to control them. They thus made better local administrators. However, delegating authority to elite Han Chinese officials engendered serious loyalty concerns: too much discretionary power to Han officials could endanger the Manchu rule. The distrust of Han elites was well-documented in historical records, especially in the early periods of the Manchu rule. For instance, Wu Sangui, the once-trusted Han elite warlord, turned out to lead one of the greatest rebellions in the early-Qing dynasty (Du, 2009). Even in the late Qing dynasty, when Li Hongzhang, the reputable Han bureaucrat, was appointed the chief minister, there were still sizable disputes among Manchu elites, questioning the loyalty of Li as a Han elite (Du, 2009).

Adding to the concern was that Han Chinese felt strong resentment of being ruled by a minority group, as evidenced by frequent revolts from Han people. The most famous and long-lasting revolt was organized by the Heaven and Earth Society (*Tiandihui* or *Hongmen*). Founded in 1674, it lasted until the end of the Qing dynasty and was the longest anti-Qing organization in the Qing dynasty (Hao, 1996). The possibility of relying on Hans to repress Han rebellions further intensified the dilemma: while Han officials knew better how to defeat local insurgents, successful repression would increase Han officials' power, thus weakening central control. The dilemma, therefore, called for systematic remedies in institutional designs to ensure the loyalty of competent Han elites.

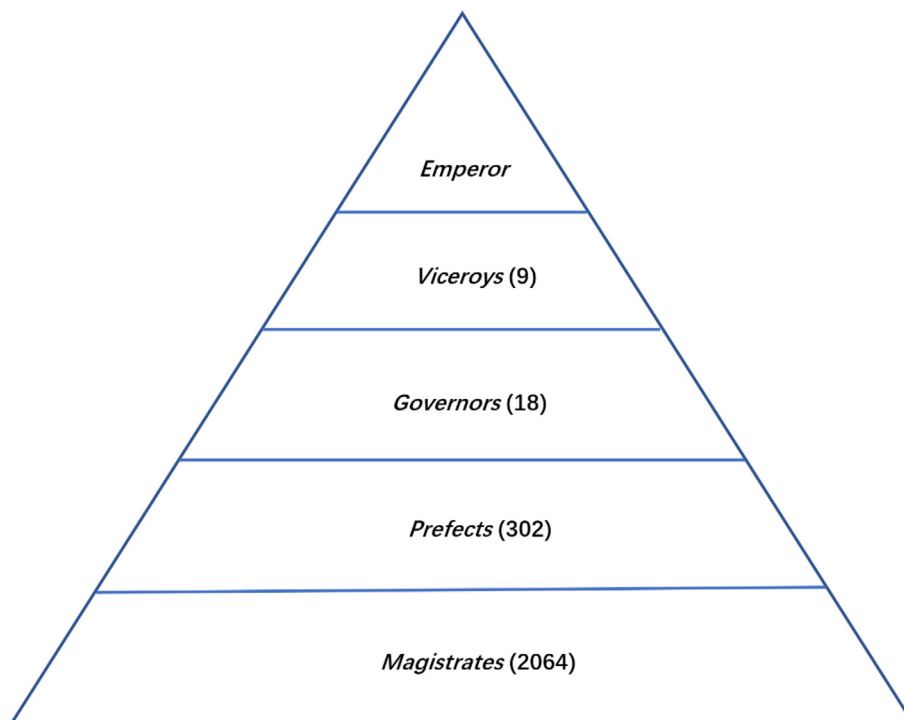
The Manchus thus needed to co-opt the Han elites, and the Han elites needed the Manchus as well. These two ethnic groups' intricate dance is well put by Tocqueville (p. 330, 1969)<sup>10</sup>:

“When the conquered people are enlightened and the conquerors half savage, as when the nations of the North invaded the Roman Empire or the Mongols invaded China, the power which the barbarians has won by his victory enables him to keep on a level with the civilized man and to go forward as his equal, until he becomes rival; one has force to support him and the other intelligence; the former admire the knowledge and arts of the conquered, and the latter envies the conqueror's power. In the end the barbarians invite the civilized people into their palaces, and the civilized open their schools to the barbarians.”

At the local level, the Manchu rulers largely kept Han officials from the Ming era to continue serving the government, often at the same duties, and used other Han officials where possible based

<sup>10</sup> As cited by Wakeman (1985) in his preface.





**Fig. 1. Bureaucratic Hierarchy in the Qing dynasty.** Note: The bureaucratic structure is retrieved from Lv (2015), and the numbers of personnel are retrieved from the Records of the Qing Emperors (Qing Shilu).

on recommendations from trusted Han officials and scholars. Indeed, at the level of prefects and magistrates,<sup>11</sup> most top officials were Han Chinese (Appendix C, Wakeman, 1985). The Manchu rulers also kept the tradition of using the Imperial Exam to select governing officials, which tended to be a commitment device for power-sharing with the Hans due to Hans' advantage in such exams (Xi, 2019). By inheriting the Ming officials and using the Ming exam system to select officials, the Qing essentially adopted the state capacity of previous dynasties in China—minus the loyalty of the Han officials. The loyalty concerns about the Hans were made evident in one of Emperor Kangxi's edicts, “I (Emperor Kangxi) have been the supreme ruler for years, but I still encounter challenges in ruling the Han Chinese, because they do not share my trust” (Yang, 1986). This necessitated the Manchu supervision to achieve adequate checks and balances. To ensure this loyalty, the Manchus adopted a clever ruling strategy of cross-ethnic assignments in the viceroy-governor positions.

### 2.3. The Viceroy-Governor Duo

Both viceroys and governors were leaders at the provincial levels. A province was a large administrative unit: its average area was 730,000 square kilometers, and the average population was 24.2 million. Thus, any individual province, if sufficiently empowered without strong monitoring, could challenge the central government. Unlike the Ming dynasty, which established only one type of top provincial office (i.e., provincial administration commissioner, *buzheng shisi*), the Manchu rulers introduced two top offices at the top regional level: a viceroy (*zongdu*) was the highest regional official, usually governing several provinces, while a governor (*xunfu*) oversaw the daily administrative affairs of a single province.<sup>12</sup>

<sup>11</sup> A typical prefect had an average jurisdiction of 40,000 square kilometers and a population of 1.3 million, while counties were smaller, with an average jurisdiction of 6,432 square kilometers and a population of 200,000.

<sup>12</sup> In addition to monitoring duties, the viceroys usually had the final say on local matters *de jure*, including administrative, military, and jurisdictional decisions.

The design of the viceroy-governor duo allowed the Manchu rulers to resolve the loyalty dilemma. Assigning Han elites to administration-oriented governor positions allowed utilizing their natural advantages of information, networking, and technology, while appointing loyal fellow Manchus to supervision-oriented viceroy positions allowed central control.<sup>13</sup> Therefore, a cross-ethnic Manchu-Han assignment accommodates both efficiency and loyalty.

Archival evidence suggests that the Manchu-Han assignments were intentional institutional designs. First, in royal edicts, Emperor Kangxi made clear that the viceroy-governor duos were designed for supervision and monitoring (Qing Shilu, Records of Emperor Kangxi, Vol. 30, p.17). Second, in Emperor Kangxi's correspondence with Asan, a Manchu Viceroy of Liangjiang in 1702, the emperor explicitly accused Asan of “favoring the Hans instead of the Manchus in the supervision” (Guan et al., 1996, p.275), which illustrates both the monitoring roles of viceroys and the emperor's distrust on the Hans. Third, in the Regulations of the Ministry of Personnel, there was an explicit bias toward Manchus in the viceroy position but not in the governor position, which implied the strategic importance of having trusted eyes in supervisory viceroy positions. The rules were as follows: when a position of governor was vacant, lower- or equal-ranked officers from explicitly specified ministries were qualified candidates, regardless of ethnicity. However, for the viceroy position, an additional selection of Manchu officers, such as the vice-generals of Manchu Banners, were also qualified candidates (Regulations of the Ministry of Personnel, Vol. 1, pp.1–10).

<sup>13</sup> An alternate way to address the loyalty dilemma, as seen in modern society, is through rotations of local officials to ensure that civil servants do not build strong social ties (e.g., Olson, 1993). However, for pre-modern Qing rulers governing a large country such as China, frequent rotations of local officials were prohibitively costly. In fact, only <2% of the local governors were rotated in our sample, which confirms that rotation was not widely adopted to address the loyalty dilemma rare under Manchu rule.

In Appendix Fig. A1, we illustrate the temporal distribution of such Manchu-Han duos. In Fig. A2, we break down the duos according to their ethnicity. As shown, the two most popular arrangements were Han-Han duos that maximized efficiency, and Manchu-Han duos that balanced loyalty and efficiency. In particular, when higher governance complexity increased the need for delegation to knowledgeable Han officials, it urged stricter monitoring from Manchu superiors.

The monitoring role of Manchu superiors is also evident in Qing archives, as shown in the correspondence between Cabina and Emperor Yongzheng. Cabina was the Manchu viceroy of Liangjiang. In a memorial to Emperor Yongzheng on the investigation results of the Han governor Wu Cunli in 1723, Cabina explicitly mentioned that “(Wu) had served in the region for years, and had known the locality well”, but that “(Wu) seemed to care about a good reputation instead of doing the job properly...and the local governance indeed did not function well”. Emperor Yongzheng replied, “I have always heard the rumor about the tax complications in Jiangsu...and Wu is not someone worth retaining” (Liu, 2016). Wu was soon relegated.

Based on our reasoning and historical evidence, the Manchu rulers often had to appoint Han governors due to the limited Manchu talent pool and the utilization of local knowledge from Han elites. And then, out of loyalty concerns, the rulers had to appoint Manchu viceroys to supervise the Han elites. We thus expect:

*The governance difficulty and Manchu-Han assignment hypothesis.* The probability of adopting a cross-ethnic duo with a Manchu viceroy and a Han governor (a Manchu-Han duo for short) in a province rises when local governance tasks are more demanding, for instance, when the locality suffers from extreme weather – which often leads to food shortages and local insurgencies.<sup>14</sup>

Since the inception of the Qing dynasty, Manchu rulers had retained stronger connections with northern Han elites, and the rulers had displayed a systematic preference for the northern Han elites over the southern ones (Chapter 6, Wakeman, 1985). One reason is that the Manchus had co-lived in the northeastern regions with migrants from the Shandong province (i.e., a northern province) and its nearby areas, and Manchus had incorporated the Hans in that region into its core army and leadership. Another reason was that the defeated Ming dynasty re-established the Southern Ming in Nanjing in the southern region, which co-existed with the Qing for a few decades. Not surprisingly, the Southern Ming regime disproportionately incorporated the southern elites. The Manchu rulers thus viewed northern Han elites as more loyal to the Qing Empire than the southern ones, and viewed the areas near the center of the Southern Ming – known as the Jiangnan areas – as being especially prone to rebellions and disloyalty. As a result, the initial Qing administration incorporated primarily northern elites into its administration apparatus, and the Imperial Exams thus drastically favored the northern examinees rather than the southern ones, which essentially implies a preference for northern bureaucrats. The trust of northern Han elites and the distrust of southern ones – especially those from the Jiangnan region – suggest that, in the presence of governance difficulties, the Manchu rulers would impose stronger monitoring in southern areas, especially the Jiangnan areas. We thus expect:

*The North-South hypothesis.* The link between governance complexity and the adoption of the Manchu-Han duo would be stronger in southern areas, especially the areas where the Southern Song dynasty held on the longest (i.e., the Jiangnan area near Nanjing).

As the Qing Empire evolved, the challenges and governing tasks changed over time, which had implications for our hypothesis. In particular, in the middle of the 19th century, several blows to the

**Qing government**—including the wars with Britain and other colonial powers, and, most importantly, the Taiping Rebellion that began in 1851—made decentralizing military power to local Han governors a necessity (Xu and Yang, 2018). Before 1850, governors were prohibited from being involved in military leadership, but starting in the early 1850s, governors were allowed to lead militarily, due to the failure of the official Qing army to contain the Taiping rebels, and the successes of many Han gentries in doing so. Meanwhile, the costs of disloyalty from Han governors rose drastically since they could now control the army. This implies that the adoption of the cross-ethnic duo in the presence of local conflicts would be even more compelling to keep the power in the Manchu hand. We thus expect:

*The regime-change hypothesis.* The link between government complexity and the adoption of the Manchu-Han duo would be stronger after the 1850s.

### 3. Data

We construct an original panel dataset from a number of historical sources spanning 1650–1911. Our dataset, covering the 18 provinces of all of the China Proper regions, allows us to empirically test the effect of governance complexity on strategic ethnic assignments of provincial leaders.

#### 3.1. Viceroys and governors

Our main dependent variable captures the ethnic combination of the viceroy-governor duo in each province and year. This information is acquired from We (2002), which collects the official records and memorials about events of national significance based on *The Records of Qing Emperors (Qing Shilu)* during 1786–1911. From these records, we build a database of viceroys and governors in the Qing dynasty, which includes 425 viceroys, among whom 234 were Han Chinese and 162 were Manchus. The database also includes 1,020 governors, with 731 Han Chinese and 255 Manchus.<sup>15</sup>

#### 3.2. Extreme weather

Our main independent variable is governance complexity, proxied by the province-level index of extreme weather. Prior studies suggest that extreme weathers, by affecting the incidence of famines, have important direct influences on peasant revolts and economic turbulence, thus increasing governing difficulty (Blattman and Miguel, 2010; Bai and Kung, 2011; Chen, 2015).

We obtain weather information from the *Atlas of Drought and Flood Distribution in China in the Past 500 Years*, which tracked the annual precipitation in 120 stations nationwide since 1470. The original index was recorded in five levels, from one to five: extreme levels correspond to high risks of floods (level less or one or two) or high risks of droughts (level four or five). We then aggregate the original index to the provincial level as the average station records within a province. Specifically, we define *Extreme Weather* as a provincial dummy variable taking the value of one if the annual provincial-level index is below two or above four, and zero otherwise. Among the 4,824 records, 552 (i.e., 11.4%) corresponded to extreme weather, and 4,272 (i.e., 88.6%) corresponded to normal weather. In particular, a representative province in our sample experienced an extreme drought every 10.2 years and an extreme flood every 13.4 years.

<sup>14</sup> For conciseness, in this paper, we refer to the cross-ethnic duos specifically as the Manchu-viceroy Han-governor combination.

<sup>15</sup> Figs. A1 and A2 in the Appendix illustrate the five-year moving average trends in the viceroy-governor duo selection.

To see how governance complexity influences viceroy-governor duos, Fig. 2 depicts the spatial distribution of cross-ethnic duos, where Panel A shows the index of extreme weather in each province, and Panel B shows the probabilities of cross-ethnic duos. The graphical evidence suggests that these two variables are positively linked.

### 3.3. Peasant revolts

To validate the impacts of extreme weather on local political stability, we collect the number of peasant revolts reported in each province and year, available from *The Records of Qing Emperors*. *The Records of Qing Emperors* provide information on social unrest during the Qing dynasty (Kung and Ma, 2014). In our analysis, we focus on the onset of revolts.<sup>16</sup> The detailed coding methods and confounding complications are discussed in the long note for Fig. A3 in the Appendix. During our sample period, there were 36,217 reported revolts, or 135.1 annually.

### 3.4. Grain prices

To measure the impacts of extreme weather on local economic stability, we collect local grain prices. The grain prices are retrieved from Chen and Kung (2016), who compiled the monthly grain prices in Qing official records in 267 prefectures from 1738 to 1910. Due to regional-specific grain cultivations, we standardize different grains into calories and transform the grain prices into a price index in constant 1900 dollars based on Peng (2006). In our sample period, the average grain price was 1.58 silver taels per picul, broadly consistent with the estimates in the literature (e.g., Luo, 2012; Gao and Lei, 2021).

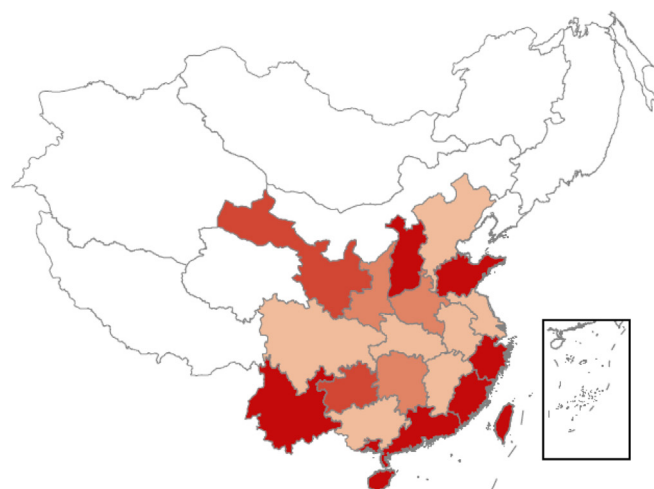
### 3.5. Control variables

**Population density.** The literature suggests that local demographics profoundly influence governance strategies (Foucault, 2007; Hu, 2015; Liu, 2017). Therefore, we control local population density from Cao (2000),<sup>17</sup> which contains population at the prefecture level in 1680, 1776, 1820, 1851, 1880, and 1910, respectively. The average population density was 93.8 (persons) per square kilometer, with significant regional variations. For instance, the density in Jiangsu Province was 296.8 people per square kilometer, whereas, in Yunnan province, it was a mere 19.4.

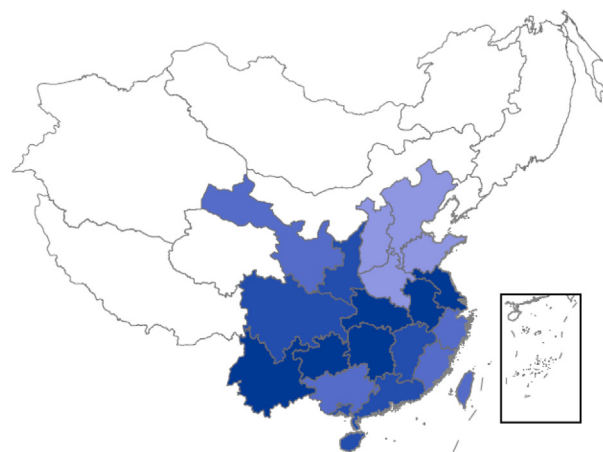
**Culture and human capital.** The literature suggests that culture is another factor that underpins bureaucratic governance (Chaudhary and Rubin, 2016). In China, Confucianism deeply shaped governing strategies (Shi and Lu, 2010), and the Manchu rulers deliberately incorporated Confucian philosophy into their ruling toolkits. Therefore, as a measure of cultural influence, we include the number of *Jinshi* – the highest attainable qualification under the Confucianism-focused civil exam – in the province during 1646–1905. Additionally, the number of *Jinshi* reflects local human capital accumulation, which may also affect the outcomes. Since both the mastering of the Confucian classics and the human

<sup>16</sup> Most existing literature focuses on the onset of revolts when it comes to civil wars (Hegre et al., 2001; Sambanis, 2001; Miguel et al., 2004; Blattman and Miguel, 2010), which measures the outbreak of the conflict, thus approximating local governance complexity. In our database, we elicit the onsets of revolts through counting the combination of “rebels” (*fei*) and “outbreak” (*hu you*), or “raise their flags” (*shu qi*), amongst other keywords in the *Records*. However, we cannot clearly identify the ends of revolts, thus the durations of the revolts are not available in our dataset.

<sup>17</sup> Cao's work marks the first attempt to systematically construct population data at the prefecture level of the Qing dynasty based on more than 3,000 local gazetteers, whose validity has been verified by the 1953 census survey and has survived the scrutiny of such eminent China scholars as Ho (1959), Perkins (1969), and Skinner (1977).



Panel A: Extreme weather



Panel B: Manchu-Han duos

**Fig. 2. Extreme Weather and the Spatial Distribution of Manchu-Han Duos.** Panel A: Extreme weather. Panel B: Manchu-Han duos. Note: Panel A: Darker colors indicate more frequent extreme weather. The white areas represent those with missing information; Panel B: Darker colors indicate longer usages of cross-ethnic duos. The white areas in both panels represent those with missing information.

capital embodied in these *Jinshi* scholars contributed to governing capacity, there is no need to distinguish the cultural and the human capital aspects associated with *Jinshi* intensity. In the sample, the average number of *Jinshi* is 5.3 per province-year.

**Technology.** Existing studies point to technological changes, especially in the agricultural sector, as determinants of governance structure (Scott, 2009; Callen et al., 2018). Thus, we use the planting share of maize, China's most important New World crop, as a proxy for technology adoption. We recover the planting of maize between 1580 and 1900 in China from Chen and Kung (2016), who use the date of first mentions of maize in local gazetteers as the inception of maize planting.

Table 1 summarizes the sources and descriptive statistics of the variables used in our analysis. Of all the viceroy-governor combinations, about 28.4 percent were Manchu-Han duos. Table 1b provides the definition of the variables.

## 4. Empirical strategy and results

We now estimate the impact of governance complexity on ethnic assignments. In Section 4.1, we introduce the empirical strat-

**Table 1**  
Summary Statistics.

Variables	Source	Obs	Mean	S.D
Han Governor	A	4014	0.759	0.428
Manchu-Han Duo	A	3117	0.288	0.453
Han-Han Duo	A	3117	0.492	0.500
Manchu-Manchu Duo	A	3174	0.110	0.313
Han Governor + Manchu Viceroy or colleague	A	4824	0.450	0.326
Han Banner-Men viceroy + Han governor	A	3117	0.982	0.298
Political turnover	A	3289	0.051	0.221
Extreme Weather	F	4824	0.114	0.318
Grain Price (log)	G	2275	4.975	0.338
Peasant Revolt (log)	B	4824	1.168	1.112
Population Density (log)	C	4824	4.145	0.909
No. of <i>Jinshi</i> (log)	D	4824	0.965	1.247
Proportion of Maize Planting	E	4824	0.540	0.343
Local Militia ( <i>tuanlian</i> )	H	262	1.130	1.498
Tax Exemption	B	68,810	1.189	3.582
Huohao Reform	B	238	0.555	0.498
Manchu-Han Duo before 1900	A	17	0.350	0.153
Yangtze Compact	B	17	0.588	0.507
Independence	B	17	7.941	4.366

**Sources:**A: *Viceroy and governors*: We, Hsiu-me (ed.). 2002. *Charts of Qing officials and offices (Qingji zhiguanbiao)*, Archive Publication Series, Institute of Modern History, Taipei: Academia Sinica. B: *Peasant revolts*: Records of the Qing Emperors (Qing Shilu). C: *Population density*: History of Population in China (*Zhongguo Renkou Shi*) and Statistics of Hukou and Farmlands in China (*Zhongguo Lidai Hukou Tianqi Tianfu Tongji*). D:*Jinshi*: Baojiong Zhu and Peilin Xie, editors. *Ming-Qing Jinshi Timing Beilu Suoyin* (Official Directory of Ming-Qing Imperial Exam Graduates). Shanghai: Shanghai Guji Chubanshe, 1980. E: *Maize planting*: local gazetteers (*difangzhi*) of each prefecture; Chen and Kung (2017). F: *Extreme weather*: Atlas of Drought and Flood Distribution in China in the Past 500 Years (Zhongguo Jinwubainianlai Hanlao Fenbu Tuji); G: [Chen and Kung \(2016\)](#); H: local gazetteers.

egy and present the baseline results. In [Section 4.2](#), we provide additional robustness checks. In [Section 4.3](#), we extend the analysis to examine the regional and temporal heterogeneity of the Manchu-Han duos.

4.1. Baseline results and robustness checks

The baseline specification is as follows:

$$Y_{it} = \alpha + \beta ExtremeWeather_{it} + X'_{it} + u_i + v_t + \varepsilon_{it} \quad (1)$$

Here *i* and *t* indicate province and year. The outcome variable of interest, *Y<sub>it</sub>*, captures the ethnic combination of the viceroy-governor duo. Our main explanatory variable is the province-level index of extreme weather, *ExtremeWeather<sub>it</sub>*, as a proxy for governance complexity. The vector *X* contains a series of control variables, including population density, the number of *Jinshi*, and the proportion of maize planting. We further control for the province and the year fixed effects to isolate the time-invariant factors and common temporal shocks.

Our main dependent variable is a dummy variable indicating the combination of Manchu viceroy and Han governor (Manchu-Han duo for short), which is the leadership arrangement to ensure both efficiency and loyalty. To account for spatial autocorrelation, we report the Conley standard errors in parentheses.<sup>18</sup> To address the potential autocorrelation in error terms due to our Small-N and Large-T panel data, we also report the Newey-West standard errors in brackets. The baseline results are in [Table 2](#).

Columns 2–5 explain the Manchu-Han duos. Across columns, we first control population density, then add the number of *Jinshi*, and further add the technology adoption indicator. The link between the incidence of extreme weather and Manchu-Han duos is qualitatively and quantitatively robust. Doubling the occurrences of extreme weather is associated with a higher likelihood of Manchu-Han cross-ethnic duos by 9.8 percentage points, or 34

<sup>18</sup> Conley (1999) standard errors adjust for potential spatial interdependence of observations. Typically, spatial independence is assumed to decrease in the distance between two observations. Since provinces are relatively big spatial units, there is complete independence for provinces that are 2 degrees apart. We also tried other cut-off values (1, 3, 4, and 5 degrees), and the results stayed the same.

**Table 1b**  
Definitions of Variables.

Variables	Definition
Han Governor	A binary variable, taking the value of one if the governor is Han Chinese.
Manchu-Han Duo	A binary variable, taking the value of one if the viceroy is Manchu and the governor is Han Chinese.
Han-Han Duo	A binary variable, taking the value of one if both the governor and the viceroy are Han Chinese.
Manchu-Manchu Duo	A binary variable, taking the value of one if both the governor and the viceroy are Manchu.
Han Governor + Manchu Viceroy as a colleague	A binary variable, taking the value of one if a neighboring province has a Manchu viceroy.
Han-Banner Viceroy and Han Governor	A binary variable, taking the value of one if the viceroy is a Han-Banner man, and the governor is Han Chinese.
Political turnover	A binary variable, taking the value of one if the viceroy-governor duo switched from same-ethnic to cross-ethnic combinations.
Extreme Weather	A binary variable, taking the value of one if extreme weather took place.
Grain Price (log)	A continuous variable: the yearly average grain price during 1738–1910, in log
Peasant Revolt (log)	The number of peasant revolts during 1644–1911, in log.
Population Density (log)	The average population per square kilometers during 1644–1911, in log.
No. of <i>Jinshi</i> (log)	The number of <i>Jinshi</i> in the province during 1646–1905, in log
Proportion of Maize Planting	A binary variable, taking the value of one if maize was introduced to the province.
Local Militia ( <i>tuanlian</i> )	Number of local militia bureau ( <i>tuanlian ju</i> ) at the county level
Tax Exemption	Annual frequency of tax exemption at the prefecture level
Huohao Reform	A binary variable, taking the value of one if the province was impacted by the Huohao Reform during 1722–1735.
Manchu-Han Duo before 1900	A proportion measure calculated by the years that a province was governed by a Manchu-Han Duo before 1990, over the total years before 1990.
Yangtze Compact	A binary variable, taking value one if the province participated in the Yangtze Compact during 1900.
Independence	The rank order of declaration of dependence during 1911–1912.



**Table 2**  
Governance Complexity and Ethnic Identity: Baseline.

	(1) Manchu-Han Duo	(2) Manchu-Han Duo	(3) Manchu-Han Duo	(4) Manchu-Han Duo
Extreme Weather	0.093*** (0.022) [0.028]	0.097*** (0.024) [0.028]	0.099*** (0.024) [0.028]	0.098*** (0.026) [0.028]
Pop. Density (ln)		0.405*** (0.125) [0.072]	0.412*** (0.129) [0.073]	0.448*** (0.106) [0.069]
No. of Jinshi (ln)			-0.063** (0.027) [0.017]	-0.063** (0.028) [0.017]
Maize Planting				-0.340 (0.209) [0.123]
Observations	3,117	3,117	3,117	3,117
R-squared	0.200	0.227	0.230	0.237
Year FE	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes

Note: In Columns 1–4, robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. Newey-West standard errors are reported in brackets.

percent of the mean. The result is consistent with the governance difficulty and cross-ethnicity assignment hypothesis: increased governance complexity leads to a higher propensity to assign competent Han officials to resolve local matters, while appointing a Manchu superior to monitor and ensure loyalty.

To ensure that extreme weather is a good proxy for governance complexity, we run two OLS regressions to show that extreme weather is closely associated with local stability and economic conditions, thus increasing governance complexity. Echoing the literature (e.g., Jia, 2014; Xi, 2019), in Columns 1–2 of Table 3, we find that extreme weather is significantly associated with more local revolts. Meanwhile, in Columns 3–4 of Table 3, we find that extreme weather is also significantly associated with higher grain prices, thus the economic turmoil, consistent with the existing literature (e.g., Jia, 2014; Albers and Pfister, 2021).

The fact that extreme weather likely affected both economic turbulence and political instability enables us to heuristically explore the relative importance of governance complexity via the channels of economic turbulence and political instability. To do this, we further control for grain price and local insurgency in the baseline, and present the results in Column 5 of Table 3. As shown, the significance of extreme weather disappears. The decomposition in Columns 6–7 of Table 3 suggests that economic shocks may play a more significant role, where the coefficient of extreme weather is lowered by 42.4 %.

Next, we check the robustness of the baseline results. First, to address potential spatial auto-correlation, we adopt the generalized spatial two-stage least squares (GS2SLS) method developed by Kelejian and Prucha (1998, 1999, 2004).<sup>19</sup> The results, presented in Table A1 in the Appendix, show that the estimated coefficients are close to our baseline in magnitudes. Our results are thus not driven by spatial interactions between provinces. Second, to check the persistent impacts of governance complexity, we add five lead and five lag periods into the baseline regression.<sup>20</sup> We present the results in

<sup>19</sup> As a special form of the Generalized Method of Moments (GMM) for models with spatially interdependent variables, this approach uses exogenous factors and their spatial lags as instruments for the endogenous regressor of extreme weather. The estimators of GS2SLS are considered to be consistent and asymptotically normal (Kelejian and Prucha, 2004), and are not subject to the influence of the “omitted common factors” in spatial interdependence (Das et al., 2003; Kelejian et al., 2013).

<sup>20</sup> Specifically, we include five leads and five lags as follows:  $y_{it} = \sum_{p=1}^5 \beta_{-p} ExtremeWeather_{i,t-p} + \sum_{q=0}^5 \beta_{+q} ExtremeWeather_{i,t+q} + \alpha_i + \lambda_t + X_{it} + \epsilon_{it}$  Where  $ExtremeWeather_{i,t-p}$  and  $ExtremeWeather_{i,t+q}$  represent the  $p^{th}$  lag and  $q^{th}$  lead. The lead terms serve as a test for the assumption of a common trend between the treatment and control groups. The lag terms show the long-term effects of the treatment effect. We thank the referee for suggesting the inclusion of leads and lags.

Table A2 in the Appendix, and provide a visualization in Fig. 3. As shown, the lead periods have no significant impacts, while the first three lag periods have a significant and positive impact: that is, more occurrences of extreme weather in the past three years would increase the assignment of Manchu-Han duos. The results thus validate the persistent impacts of governance complexity. Third, to rule out the concern that our results were solely driven by the Taiping rebellion, we replicate the analysis with a subsample excluding the regions impacted by the Taiping rebellion, and present the results in Table A3 in the appendix. Our baseline results remain robust.

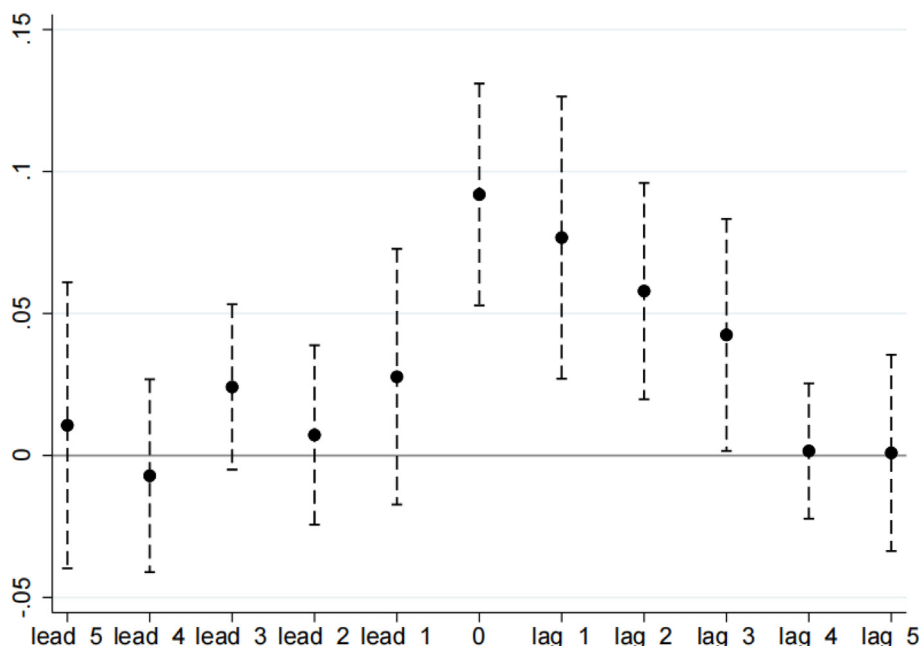
Another robustness check concerns the alternative ruling strategies of the Manchu rulers. As in the case of the rule of many other dominant minorities, the Manchus strived to create a trusted group among the majority elites, known as Han Banner-men – the Manchu-acknowledged noble Han elites. These trusted Han elites were officially included in the traditional Manchu Banner system, and their talents and loyalty greatly facilitated the Manchu conquest and rule. Historically the Han Banner-men were regarded as close substitutes for Manchu officials when it came to loyalty (Chen, 2013).<sup>21</sup> Consequently, an alternative mechanism is to assign Han Banner-men as supervisory viceroys. We thus replicate the baseline regression to see whether the imperial rulers also preferred to assign Han-Banner-Men viceroys with Han governors when the ruling tasks were complex. As shown in Table 4, when a province experienced more extreme weather, Manchu rulers had no higher tendency to assign Han Banner-men to the supervisory viceroy positions – a stark comparison with our baseline results. Moreover, we show, in Appendix Table A4, that

<sup>21</sup> Across the world, the strategy for capturing dominant-ethnic elites was widely adopted historically. For instance, France in the 19th century had been recruiting local non-French elites to form Foreign Legions in their colonies. Some of the members were later granted French citizenship (Lispector, 1992). Similarly, the British government widely implemented the honor system in colonies from India, Malaysia to Hong Kong, rewarding the local loyalists and contributors of colonel rule (Galloway, 2014). In the case of the founding of the Qing dynasty, the policy of ensuring loyal support of the Han people was a prioritized policy of the founding Manchu leaders. Indeed, the Manchus had strong divisions of Han soldiers loyally serving the Manchu cause, and the Manchu leaders had numerous cooperative and loyal Han military leaders serving under them as well. These early Manchu-cooperative Hans were designated as Han Banner members, and were treated more similarly as Manchu's own than other Hans (p. 45, 60–61, Chapter 3, Wakeman 1985). The Han Banner members group played crucial roles in the Manchu conquest. For instance, in 1648, Han Banner members consisted of 75% in the Qing army, among Manchu and Mongol soldiers (Fairbank, 1992).

**Table 3**  
Decomposition of Governance Complexity.

	(1) Peasant Revolts	(2) Peasant Revolts	(3) Grain Prices (log)	(4) Grain Prices (log)	(5) Manchu-Han Duo	(6) Manchu-Han Duo	(7) Manchu-Han Duo
Extreme Weather	0.154*** (0.0347)	0.155*** (0.0344)	0.0462** (0.0210)	0.0490** (0.0191)	0.0482 (0.0269)	0.0707** (0.0286)	0.0564* (0.0268)
Peasant Revolts					-0.124 (0.210)	-0.00408 (0.183)	
Grain Prices (ln)					0.187*** (0.0216)		0.204*** (0.0297)
Pop. Density (ln)		0.142* (0.0779)		0.151* (0.0808)	0.220* (0.116)	0.226** (0.0931)	0.422*** (0.109)
No. of Jinshi (ln)		-0.0293 (0.0202)		-0.00671 (0.0190)	-0.115 (0.0685)	-0.128 (0.0760)	-0.0541* (0.0284)
Maize Planting		-0.0319 (0.188)		0.0428 (0.185)	-0.0384 (0.333)	0.0515 (0.344)	-0.314 (0.210)
Observations	4,824	4,824	2,274	2,274	1,271	1,271	3,117
R-squared	0.775	0.776	0.695	0.705	0.319	0.266	0.295
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.



**Fig. 3. Visualization of Leads and Lags.** Note: The dots indicate point estimates, and the dashed lines indicate 95% confidence interval. The effect of leads represents the effect of extreme weather on the past Manchu-Han duos, and the effect of lags represents the effect of extreme weather on the subsequent Manchu-Han duos. The visualization style follows Autor (2003).

**Table 4**  
Governance Complexity and Ethnic Identity of Leaders: Banner System.

	(1) Han-Banner Viceroy & Han Governor	(2) Han-Banner Viceroy & Han Governor	(3) Han-Banner Viceroy & Han Governor	(4) Han-Banner Viceroy & Han Governor
Extreme Weather	-0.019 (0.016)	-0.019 (0.016)	-0.018 (0.016)	-0.019 (0.016)
Pop. Density (ln)		0.000 (0.028)	0.001 (0.028)	0.004 (0.027)
No. of Jinshi (ln)			-0.008 (0.001)	-0.008 (0.010)
Maize Planting				-0.029 (0.076)
Observations	3,797	3,797	3,797	3,797
R-squared	0.157	0.157	0.157	0.158
Year FE	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes

Note. Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Manchu rulers had no higher tendency to assign Han military officers as provincial commanders-in-chief when the ruling tasks were complex.<sup>22</sup> The findings yield two implications. First, in the loyalty-competence tradeoff, loyalty was crucial for the Manchu rulers, so they did not risk assigning presumably trusted Han elites for supervision. To the Manchu rulers, the Han Banner-men were still not “one of us” regarding matters of importance. Second, the results show that the cross-ethnic assignment remained a crucial monitoring device on top of other alternative ruling strategies adopted by the Manchu rulers.

#### 4.2. Additional robustness checks

**Same-ethnic duos.** According to our governance difficulty and cross-ethnicity assignment hypothesis, Manchu-Han cross-ethnic duos solved the competence problem by appointing a Han elite as governor, and solved the loyalty concerns by assigning a Manchu viceroy for supervision. This, on the other hand, implies that neither a Han-Han duo – the one that maximizes efficiency, nor a Manchu-Manchu duo – the one that ensures utter loyalty, is desirable under challenging local environments. To check this implication, Table 5 presents the results of the effect of governance complexity on the probability of same-ethnic duos. Column 2 shows that higher governance complexity indicates a lower likelihood of same-ethnic duos. To further break down the analysis, Columns 3 and 4 show that governance complexity has a negative impact on Han-Han duos, but is not significantly associated with the probability of Manchu-Manchu duos. Taken together, the results demonstrate that same-ethnic duos were not the go-to solutions for Manchu rulers when facing substantial governance challenges. Instead, Manchu-Han duos were.

To further break down the appointment of Manchu-Han duos, we focus on the political turnover that directly aimed to address the competence-loyalty tradeoff: the turnover from Han-viceroy plus Han-governor to Manchu-viceroy plus Han-governor. When negative shocks came or when ruling tasks became more complex, Han governors tended to be more competent in solving local problems and thus were more likely to accumulate discretionary power, which might threaten the Manchu rule. If the viceroy-governor duo at this time was Han-Han, the ruler likely would become increasingly concerned about the possible collusion between the Han governor and Han viceroy, in addition to the accumulated local Han elites’ influence. Thus, the Manchu ruler had incentives to replace the Han viceroy with a trusted Manchu viceroy to supervise and monitor the Han governor. We present the result in Panel A of Table A5 in the Appendix. Our baseline result remains robust: the switch from Han-viceroy plus Han-governor to Manchu-viceroy plus Han governor was significantly positive during hard times, and the result remains robust after controlling a series of socioeconomic characteristics. Furthermore, we conduct a placebo test on political turnovers into other cross-ethnic assignments, and present the results in Panel B of Table A5. As shown, all other turnovers were not impacted by governance complexity.<sup>23</sup>

<sup>22</sup> Specifically, we collect the personnel assignment data of provincial commander-in-chief (*Tidu*), the highest-ranked military officer in a province (Du, 2014), from The Lists of Bureaucrats in the Qing Dynasty, by Qian (1980), which detailed the names, ethnicity, and office tenure of all the *Tidu* in the Qing dynasty. Based on the information, we replicate the baseline analysis, and replace the dependent variable with the assignment of Han *Tidu*. As shown in Appendix Table A4, we find that increased governance complexity did not increase the assignment of Han military officers. We thank the referee for pointing us to the discussions of Han military officers’ appointments.

<sup>23</sup> Specifically, the turnovers from Manchu-Manchu duos to Manchu-Han duos are positively associated with increased governance complexity, but the result is statistically insignificant partially due to the limited cases of such turnovers. We thank the referee for suggesting the break-down of political turnovers.

**Table 5**  
Governance Complexity and Same-ethnic Duos.

	(1) Han-Han Duo	(2) Manchu-Manchu Duo	(3) Same-Ethnicity Duo
Extreme Weather	-0.0667** (0.0292)	-0.00957 (0.0188)	-0.0645* (0.0365)
Pop. Density (ln)	-0.363*** (0.0927)	-0.000783 (0.0375)	-0.129* (0.0650)
No. of Jinshi (ln)	0.0127 (0.0214)	0.0423*** (0.0131)	0.0650*** (0.0190)
Maize Planting	0.161 (0.197)	0.135 (0.152)	0.235 (0.142)
Observations	3,117	3,117	4,824
R-squared	0.349	0.210	0.320
Year FE	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes

Note: Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

In addition to the binary-outcome estimates, we examine political turnovers regarding ethnic composition using a polynomial logit model to provide a fuller picture. Specifically, we use Han-viceroy and Han-governor duos as our base outcome, and test whether higher governance complexity leads to increased political turnover to either Manchu-Han duos, Manchu-Manchu duos, or Han-Manchu duos. Table 6 presents the results. Column 1 shows that higher governance complexity indicates a higher likelihood of political turnover from Han-Han to Manchu-Han duos. In contrast, Columns 2 and 3 show that governance complexity does not significantly impact political turnovers into Han-Manchu duos or Manchu-Manchu duos. Taken together, our key results remain robust using polynomial logit estimates.

**Peer Supervision.** The Manchu rulers could use an alternative way of official assignment to balance efficiency and loyalty goals. Besides direct monitoring from viceroys, governors from neighboring provinces could also monitor local governors to prevent insurgent colleagues. For instance, it is possible to surround an elite Han governor with a Manchu colleague in neighboring provinces, who would be better informed than the faraway emperor on the loyalty of his Han colleague, and who could report observed misbehaviors to Beijing. To investigate this possibility of peer monitoring across provinces, we replace the dependent variable with a dummy variable indicating whether a Han governor had a neighboring Manchu colleague – either as a governor or as a viceroy -- and replicate the regressions. We present the results in Table 7.

As shown in the table, increased governance complexity did not increase the likelihood of assigning a Manchu governor to the neighborhood. Thus, peer supervision was not an adequate substitute for the Manchu-Han duos. We conclude that checks and balances on local governors mainly came from vertical – instead of horizontal – supervision. A possible reason may be that the neighboring governors had limited supervision authority and lacked access to communication technology to permit prompt information sharing (Li, 2005). After all, the world more than a century away was characterized by high communication costs, and hundreds of miles were quite far to observe what was going on closely. To summarize, the results underscore the necessity of using cross-ethnic Manchu-Han duos to alleviate competence-loyalty tradeoffs.

#### 4.3. Regional and temporal heterogeneity

As the North-South hypothesis implies, the historical legacy of the Qing suggests that we need to consider the spatial distribution of governance complexity on leadership ethnicity identity. To this

**Table 6**  
Political Turnovers: Polynomial Logit Estimates.

	(1) Manchu-Han Duo	(2) Han-Manchu Duo	(3) Manchu- Manchu Duo
Extreme Weather	0.376*** (0.140)	-0.166 (0.213)	-0.139 (0.218)
Maize Planting	3.073*** (0.233)	0.487* (0.258)	1.266*** (0.270)
Pop. Density (ln)	-0.0804** (0.0372)	0.0525 (0.0515)	-0.0314 (0.0507)
No. of Jinshi (ln)	-3.753*** (0.290)	0.712** (0.306)	-1.770*** (0.337)
Constant	-12.30*** (1.140)	-4.295*** (1.034)	-6.093*** (1.097)
Observations	3,069	3,069	3,069
Pseudo R-squared	0.010	0.010	0.010

Note: Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. Han-Han Duo is the base outcome.

**Table 7**  
Peer Supervision.

	(1) Han Governor with neighboring Manchu colleagues	(2) Han Governor with neighboring Manchu colleagues	(3) Han Governor with neighboring Manchu colleagues	(4) Han Governor with neighboring Manchu colleagues
Extreme Weather	0.0177 (0.015)	0.018 (0.015)	0.018 (0.015)	0.018 (0.015)
Pop. Density (ln)		0.012 (0.031)	0.009 (0.033)	0.012 (0.037)
No. of Jinshi (ln)			0.023*** (0.007)	0.023*** (0.007)
Maize Planting				-0.025 (0.097)
Observations	4,824	4,824	4,824	4,824
R-squared	0.585	0.585	0.586	0.586
Year FE	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes

Note: Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

end, we separate the provincial samples into four sub-samples by their distances to the capital (i.e., Beijing) –within 1,000 km, 1,000–1,500 km, 1,500–2,000 km, and 2,000 + km radius. We note that the 1,000–1,500 km segment contains the Jiangnan areas where the initial resistance to Qing was the strongest. We then replicate our estimation by running four separate estimations, and present the results in Table 8. When a province is further away from Beijing, it is more likely to have Manchu-Han cross-ethnic duo in general, but especially when it is within 1,000 to 1,500 km (to Beijing), that is, for the areas containing the Jiangnan area. This supports the North-South hypothesis, and the existing literature that the lack of local information encourages delegation to experts more familiar with local situations, but also calls for stricter supervision (Hayek, 1945; Aghion and Tirole, 1997; Huang et al., 2017).

Next, we examine how the adoption of the Manchu-Han duo changes over time and test the regime-change hypothesis—that is, cross-ethnic duo arrangements were more likely when the disloyalty concerns were more severe. To this end, we classify the whole Qing dynasty from 1644 to 1911 into three periods: the founding era (1644–1681), which ended with having successfully handled Han warlords in the peripheral areas of China; the era of stability (1682–1850), which was characterized by relative stability and lack of large conflicts; and the era of decline (1851–1911), which began with the Taping Rebellion and the permission from the central authority to allow governors taking charge of local military forces. In this part of our analysis, we exclude the founding era from the analysis because it was characterized by sporadic

fight between Ming-loyalists and the Manchu government, and a stabilized Manchu-Han relationship was yet to be formed. For the remaining two eras, we expect higher adoption of cross-ethnic duo arrangements when the disloyalty concerns were more severe in the era of decline than in the era of stability.

We present the results in Table 9. In particular, we report two specifications, with and without other covariates. The results consistently show that, during the era of stability, the link between extreme weather and Manchu-Han duos was consistently positive but not statistically significant. In sharp contrast, during the era of decline when governors were allowed to control the military, the link between governance complexity and the Manchu-Han duo arrangements became more pronounced and statistically significant. The results support the regime-change hypothesis.

### 5. Efficacy of Manchu-Han duos

We have presumed that the cross-ethnic duo arrangements facilitated both efficiency and loyalty. Is there evidence that this was indeed so? In this section, we first provide an overall evaluation of the impact of Manchu-Han duos on local economic development. We then provide empirical evidence on the efficacy of Manchu-Han duo arrangements in two dimensions: increasing execution efficiency, and enhancing imperial loyalty.

For the overall impact of the Manchu-Han duo arrangement on local economic development, we do not have modern indicators such as GDP per capita to capture the development in the Qing dynasty. Instead, economic history literature has relied on popula-



**Table 8**  
Spatial Distribution of the Influence of Governance Complexity.

	(1) 0–1000 km	(2) 1000–1500 km	(3) 1500–2000 km	(4) >2000 km
Extreme Weather	0.104*** (0.0177)	0.193*** (0.0282)	0.009 (0.042)	0.125*** (0)
Pop. Density (ln)	0.860** (0.280)	0.380 (0.241)	1.074* (0.433)	1.539*** (0)
No. of Jinshi (ln)	-0.0383 (0.0218)	-0.0978 (0.0494)	-0.132 (0.0667)	0.0148*** (0)
Maize Planting	-0.506 (0.514)	0.0360 (0.474)	-0.805 (0.548)	-1.038*** (0)
Constant	-3.425* (1.440)	-1.345 (0.941)	-3.401 (1.538)	-4.952*** (0)
Observations	795	867	966	444
Year FE	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes
Number of provinces	6	4	4	2

Note: Robust standard errors in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

**Table 9**  
Temporal Heterogeneity of Manchu-Han Duos.

	The stability era: 1681–1850		The decline era: 1850–1911	
	(1) Manchu-Han Duo	(2) Manchu-Han Duo	(3) Manchu-Han Duo	(4) Manchu-Han Duo
Extreme Weather	0.0325 (0.0308)	0.0489 (0.0292)	0.0893** (0.0328)	0.0877** (0.0328)
Pop. Density (ln)		1.865*** (0.162)		0.179* (0.0978)
No. of Jinshi (ln)		-0.0455 (0.0263)		-0.133** (0.0487)
Maize Planting		0.0101 (0.108)		0.0613* (0.0287)
Observations	1,987	1,987	714	714
R-squared	0.197	0.320	0.175	0.190
Year FE	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes

Note: Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

tion density and urbanization indicators.<sup>24</sup> We follow this literature by relating provincial population density in year *t* to its once-lagged Manchu-Han duo dummy, along with province and year fixed effects. The province fixed effects capture all time-invariant factors, while the year fixed effects capture the overall trend. The results, in Column 1 of Table 10, show that regions under the cross-ethnic duo arrangement had significantly higher subsequent population density, consistent with the premise that cross-ethnic leadership was good for local development.

In terms of increasing executive efficiency, we provide two sets of evidence. First, we track the implementation time of the *Huohao* tax reform during 1723–1725, which concerned all informal levies collected by local governments in addition to formal taxes. Such informal levies were used to maintain local offices and perform their duties (Ch’ü, 1962). The goal of the centralization reform was to formalize informal levies: such levies would be handed to the central government, which would then make transfer payments (*yanglianyin*, or “anti-corruption salaries”) to the local governments to maintain their offices and provide public goods. This reform would tie the hands of local officials, and its earlier implementation would signal responsiveness to the agenda of the Qing authority. We expect earlier implementation of the central-directed reform in regions under Manchu-Han duo leadership than

those under Han-Han leadership. Column 2 in Table 10 presents the results. Consistent with our conjecture, provinces under Manchu-Han duos had pushed for the central-led reform policy more proactively by 9.4 percentage points, or 17 percent of the sample mean.

The second set of evidence concerns local tax exemption as a measure of efficiency. In the Qing dynasty, the imperial court could issue local tax exemptions as reliefs when local fiscal conditions faced challenges. The frequency of such relief then became an indicator of local executive efficiency – the more frequent the reliefs, the less capable an official would be perceived in resolving local matters without external aid. The exemption relief information is retrieved from *Qing Shilu* (Records of the Qing Emperors), which recorded prefectural tax information of the Qing dynasty. We search for the keywords “*juanmian*” (tax exemptions as reliefs), and count the annual frequency for each province. We present the results in Column 3 of Table 10, which shows that provinces under more extended Manchu-Han duos leadership had received fewer tax exemption reliefs.

In terms of enhancing imperial loyalty, we examine three measures as proxies for recognition of the central authority, and investigate their links with the cross-ethnic duos. The first measure is whether a province participated in the Yangtze Compact in 1900. During the anti-colonists Boxing Rebellion in the late Qing dynasty, the imperial court tried to direct peasants to attack foreigners. However, ten southeastern provinces declined the order of endorsing the Boxing Rebellion (Feuerwerker, 1958; Xie, 1986; Bai and

<sup>24</sup> See, for instance, De Vries (1976), Bairoch (1988), Acemoglu et al., (2002; 2005), Clark (2007), Campbell and Lee (2008), Chen et al. (2010), Jia (2014), and Nunn and Qian (2011).

**Table 10**  
Efficacy of Power Checks.

	(1) Population Density	(2) <i>Huohao</i> Reform	(3) Tax Exemption	(4) Yangtze Compact	(5) Independence	(6) Local Militia
Manchu-Han Duo (lagged)	0.061*** (0.018)	0.094* (0.055)	-0.133** (0.057)			
Proportion of Manchu-Han Duos Before 1900				-0.091*** (0.075)	-1.022*** (5.297)	30.50** (11.66)
R-squared	0.957	0.356	0.185	0.172	0.187	17
Observations	3108	168	41,268	17	17	0.180
Year FE	Yes	Yes	Yes	No	No	No
Provincial FE	Yes	Yes	Yes	No	No	No

Note: In Columns 1–2, robust standard errors are clustered at the provincial level in parentheses. In Column 3, robust standard errors are clustered at the prefectural level. In Columns 5–6, robust standard errors are clustered at the provincial level.\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Kung, 2015).<sup>25</sup> Such decisions were consequently regarded as defiance of the central authority by the supreme leader, Empress Cixi (Guo, 2010). Column 4 in Table 10 presents the results. Indeed, provinces under cross-ethnic duo leadership were more reluctant to defy central authority, that they were less likely to participate in the Yangtze Compact in 1899.

The second measure is the time of the independence declaration in the last days of the Qing dynasty. After the Wuchang Uprising on October 10, 1911, provinces across China declared their independence from the Manchu government one after another. We measure the degree of loyalty by the time these provinces declared independence – the later the date, the more loyal the province. We expect provinces with Manchu-Han duos to be less likely to defy central orders (i.e., participated in the Yangtze Compact) and would declare independence later than others.<sup>26</sup> Column 5 in Table 10 presents the results. Provinces under cross-ethnic duo leadership declared independence later in 1911, exhibiting higher recognition to the imperial court.

The third measure is the size of locally trained militias (*tuanlian*). In the turbulent late Qing dynasty, local gentries had to train the militia to maintain social order and thus support imperial rule. Larger-sized militia in training indicated higher effort in supporting the imperial court. The expenses of the militia were financed by the local militia bureaus (*tuanlian ju*). Thus, the number of local militia bureaus is a good proxy for local militia sizes. We count the number of county-level militia bureaus from gazetteers, and then aggregate them into provincial-level data. Based on Column 6 of Table 10, regions with longer ruling history under Manchu-Han duos had more militia bureaus – thus larger sizes of local militia, which confirmed their imperial loyalty.

## 6. Discussion and conclusion

As in the case of colonization, indirect governance is often a must when the rulers are affiliated with an ethnic group with far fewer people than the dominant ethnic group. Under indirect governance, it is a critical challenge to ensure the loyalty of local elites of the dominant ethnic group while eliciting their best governing efforts, which would multiply the governance benefits by their superior local information, talents, and access to pre-existing state capacity. In this paper, we offer evidence of a strategy systematically adopted by Manchu rulers in Qing China to achieve a balanced approach aiming at both efficiency and loyalty: the cross-ethnic duo arrangement of assigning local Han elites as provincial governors to solve daily administrative problems, and appointing Manchu superiors (viceroys) to monitor and ensure loyalty. We

show empirically that the likelihood of such Manchu-Han duos increases with governance complexity, as proxied by the occurrence of extreme weather in the locality. An increased governance complexity also shifts political turnovers towards Manchu-Han duos. We further find that provinces further away from the Qing capital, especially those that offered stiffer opposition to Manchu rule initially, such as the Jiangnan area, tended to face stronger competence-loyalty tradeoffs, that is, a stronger positive link between the adoption of cross-ethnic duo leadership and governance complexity. Furthermore, when the Manchu rulers, facing western invasions and domestic rebellions, had to concede the discretion of military leadership to Han governors to survive politically, Manchu monitoring in the role of viceroys further increased.

Among the sensitivity checks, we offer evidence that monitoring of local leaders was largely via the vertical framework (i.e., viceroy on governors) rather than from neighboring provinces. We further show that the cross-ethnic duo leadership was associated with higher subsequent population density, was more responsive in implementing central policies, and was less likely to break away from the Empire, indicating the efficacy of the arrangement.

The cross-ethnic duo arrangement had been successful for the Qing Empire in general, as demonstrated by the long duration of the dynasty's rule, the sizeable increase in population during the reign, and the large territory expansion. Furthermore, the duo arrangement was believed to have left a legacy in the dual leadership structure in modern China, which, to some scholars, serves to alleviate the competence-loyalty tradeoff (e.g., Li, 2019). However, the arrangement is not the only strategy that maintained the dominant minority rule: On one hand, the Manchu rulers assimilated the Confucian practices, placed themselves in the ruling systems, propagated the transition from the Ming dynasty to the Qing dynasty followed the Mandate of the Heaven (Yang, 2020), and welcome the Han elites into the governance. On the other hand, the Manchu rulers controlled the ideology and required obedience through persecuting speech crimes (e.g., Koyama and Xue, 2015; Xue, 2021), and the campaigns of *Tifayifu* ("shaving hair and changing costume", See Fig. A4 in the Appendix for an illustration). Underneath these initiatives lies the fundamental distrust of Manchu rulers toward the Han Chinese.<sup>27</sup>

However, the arrangement was insufficient to save the Manchu rulers. The multiple shocks of severe weather changes in the middle of the 19th century, Western invasions, and one of the largest

<sup>25</sup> The ten provinces include: Shandong, Jiangsu, Anhui, Henan, Shaanxi, Zhejiang, Fujian, Jiangxi, Guangxi, and Guangdong.

<sup>26</sup> Larger entries correspond to later time of declaration. For instance, we assign the first province to declare dependence, i.e., Hubei province, with value 1; and the second province with value 2.

<sup>27</sup> While it was true that good governance alleviated the need for supervision, the fundamental distrust was deeply embedded in the Manchu's mind. To see this, we collect the data on the Qing government's efforts on disaster relief, proxied by the number of local *Changping Granaries*, granaries that offered grains during disasters, and investigate if more provision of public goods may substitute supervision. We present the results in Table A6 in the Appendix, which shows that: 1. the imperial court still assigned more Manchu-Han duos in regions with higher governance complexity; 2. the need for the assignment was lessened in regions with better governance outcomes, but was not mitigated. Collectively, we show that even when good governance helped, supervision remained necessary.

rebellions in China's history (i.e., the Taiping Rebellion) joined forces in the middle of the 19th century. The weak state capacity of the Manchu rulers made the official Qing Army entirely inadequate to put down the Rebellion. The Manchu rulers then had to allow the Han elites to raise local armies/militias under their own charge to fight the rebels. Out of this arrangement, as we have documented, the ethnic duo arrangement was even more heavily used in the presence of internal conflicts. However, that was not enough to contain the growing power of Han governors and viceroys, and eventually, the Han scholar-generals such as Zeng Guofan, Li Hongzhang, and Yuan Shikai became dominant in late Qing politics, and China soon reverted back to the Han people, and in 1911, the Qing Empire collapsed.<sup>28</sup>

### Data availability

Data will be made available on request.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Appendix A. Appendix figures and tables

#### Translated script

July, Guangxu 26 (1900):

A telegraph report from Shutang Liu suggests that a rebel group led by Laitou Wu and Jiafu Liu has formed in Jiangshan County and Pucheng County. They have captured Jiangshan County and Changshan County. Keep alert!

From Guangxu Shilu (vol. 266).

#### Details of the coding method

This section summarizes the coding method of our dependent variable: the number of rebellions. We start by describing the structure and content of *Qing Shilu* (The Records of Qing Emperors). Then the detailed steps taken to locate and code the relevant records are described with illustrative examples.

*Qing Shilu* is a collection of 13 books, each corresponding to one of the 13 emperors in Qing China. The books consist of the emperors' words, orders, and activities documented daily. It is a unique data source that systematically tracks the universe of rebellions throughout the Qing dynasty.

The original books of *Qing Shilu* are hard to read due to their traditional format (right-to-left, vertical writing) and traditional usage of the Chinese language. To facilitate the task, we obtained the digitized text of the books available at *Chinese Text Project* and collected the information in the following steps<sup>29</sup>:

<sup>28</sup> The Taiping Rebellion (1850–1864) was one of the largest-scale civil wars in imperial China, where the rebels occupied a reign of 30 million people at their prime. The massive civil war forced the Manchu rulers to prioritize efficiency, and heavily delegated to the Han elites to resolve complex issues in mobilization, taxation, and logistics. The Manchu rulers thus replaced the Manchu viceroys with the Han elites, turning the Manchu-Han duos into a Han-centric network. For instance, in 1857, the emperor replaced Yiliang, the Manchu viceroy of Liangjiang, with a Han elite named He Guiqing, and further replaced He with another Han elite Zeng Guofan, who eventually cracked down the rebellion by his Xiang Army. The success of Zeng and his fellow Han elites soon transformed into their substantial political influence, which went beyond the Manchu rulers' control (Bai et al., 2022).

<sup>29</sup> <https://ctext.org>. See Sturgeon (2019) for a description of the project.

**Step 1.** We identified the items in the books related to rebellions by looking for the keyword “*fei*” (bandits), the most common term used by the Qing government to refer to the rebels.<sup>30</sup> A typical record starts by describing the activities of the rebels, followed by the emperors' instructions on how to deal with them. Specifically, it would mention where the rebels originated, where they headed, and where they were stationed.

**Step 2** We extract the following information through a thorough reading of the texts: i) the year of the event reported; ii) the counties involved; iii) the activities that took place. For events that involve multiple counties, we identify the activities for each county (i.e., we have activities for each event-county pair).

**Step 3** We pinpoint the counties' locations by matching their names to the administrative boundaries of counties as of 1820.<sup>31</sup>

**Step 4** For each event-county record, we categorized the activities into five groups according to the descriptions of the event: *onset*, *attacking*, *defending*, *stationing*, and *retreating*. Specifically, *onset* refers to cases where the rebelling group did not exist previously and started to rebel locally. This is often identified by phrases such as “*hu you*” (suddenly there is), “*shu qi*” (raise their flag), and “*qi shi*.” *Attacking* refers to cases where the rebelling group already exists and is trying to attack another county. *Defending* refers to cases where the rebelling group already exists and is being repressed by the government. *Stationing* refers to cases where the rebelling group already exists and is staying in one county without further military action. Finally, *Retreating* refers to cases where the rebelling group already exists and retreats to a different county (often after being defeated by the government).<sup>32</sup>

**Step 5** Finally, for each county-year, we count the number of events by action type and construct a balanced panel where a value of 0 is assigned to county-year pairs with no reports of a specific type of action. We also generate for each action type a dummy variable indicating the presence of the specific type of action in the county year.

Although the books of Qing Shilu are the most reliable source for rebellions in the Qing dynasty, the fact that they are not statistical books in standard format posed some complications for our data collection process. Such complications, if not handled properly, could have affected the accuracy of the data collected. We made every effort to address these complications. First, while most of the events were reported in the year they happened, in some cases, they were reported one or more years later, especially if an event occurred at the end of the year but was reported at the beginning of the following year. While we primarily rely on the year of reporting to document time, we identify phrases such as “last year” and “back in some specific year” to make corrections accordingly.

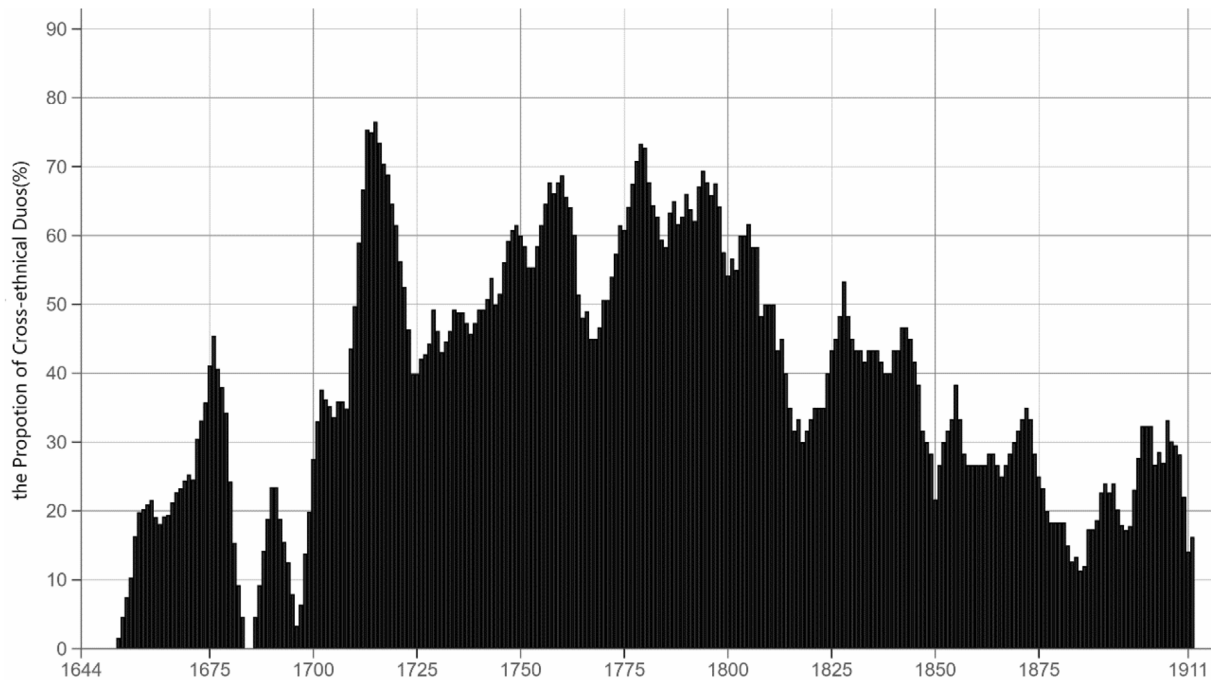
Second, the records for some years are known to be inaccurate. For example, the cases reported in 1768 are mostly miscarriages of justice in which innocent people were accused and interrogated during the government's campaign against a sorcery rumor.<sup>33</sup> The reports in 1818 are intertwined with many previous events over

<sup>30</sup> The Qing government often referred to rebel groups according to their identity (usually the location or the leader's surname) followed by the keyword “*fei*”. For example, “*yue fei*” refers to rebelling groups originating from Guangdong and Guangxi (also named “*yue*”); “*cuan fei*” refers to rebels moving around (“*cuan*”).

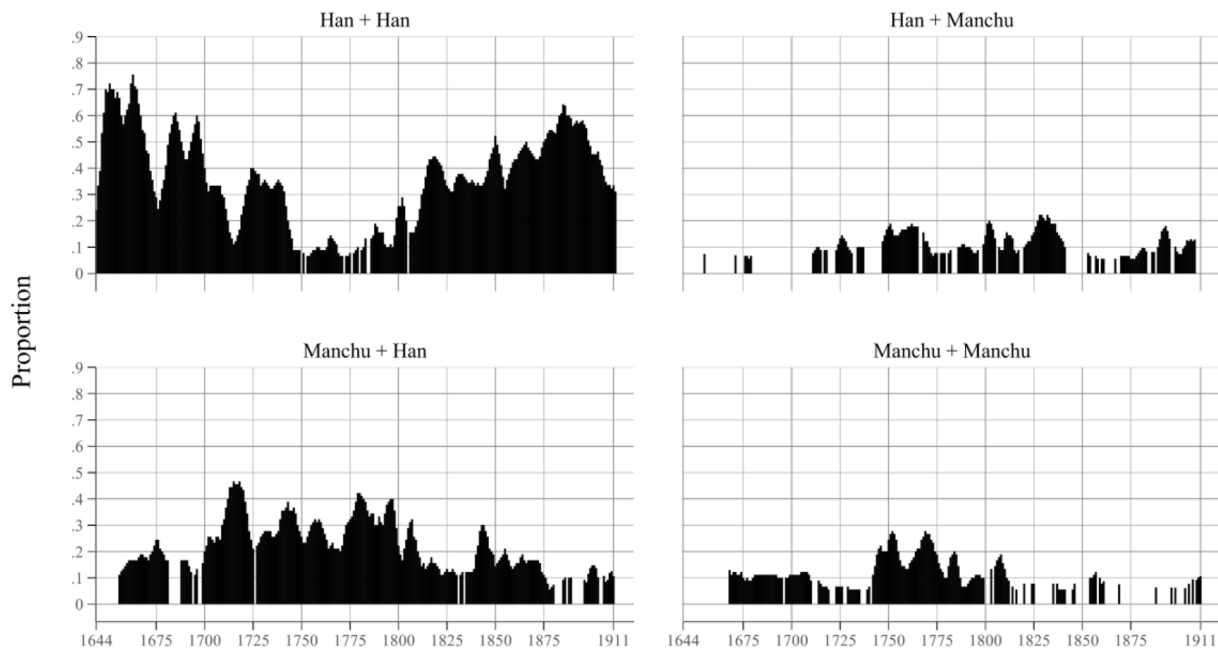
<sup>31</sup> The county boundaries were relatively consistent throughout the Qing dynasty despite the frequent adjustments in prefectural and provincial boundaries (Ge, 1997). In the rare cases when the names did not match, we relied on online searches to link the county names mentioned in the records to 1820 counties.

<sup>32</sup> Unfortunately, our data do not allow us to further distinguish various types of rebellions, such as food riots or political grievances.

<sup>33</sup> In spring 1768, mass hysteria broke out over rumors that sorcerers were roaming the country, cutting off men's braids and stealing their souls. During the campaign against the rumor, people brought false charges against marginalized people of society, and officials extracted confessions of sorcery from the innocent under torture (Kuhn, 1990).



**Fig. A1. Temporal Distribution of Manchu-Han Duos.** Note: The calculation is based on five-year moving averages.



**Fig. A2. Breakdown of Duos.** Note: Han bannermen are considered Manchus for this plot. The overall trend remains unchanged when Han Banner Men are considered as Han Chinese.

the previous decades due to the backlog clearing campaign. Therefore, we discard all cases reported in 1768 and 1818 to ensure that the distortion does not bias our results.<sup>34</sup>

Third, it is not uncommon in *Qing Shilu* for one event to be reported and discussed multiple times, which could have caused double-counting. However, when the record refers to an already reported event, it typically starts with an indicator phrase such as “as reported before”. We use such phrases to identify and dis-

card duplicate reports to minimize the risk of double counting. We also discard cases with phrases that imply that they are explicitly connected to previous ones (e.g., one is a continuation of the other or initiated by the same leader, or there is some collusion between the rebels, etc.).<sup>35</sup>

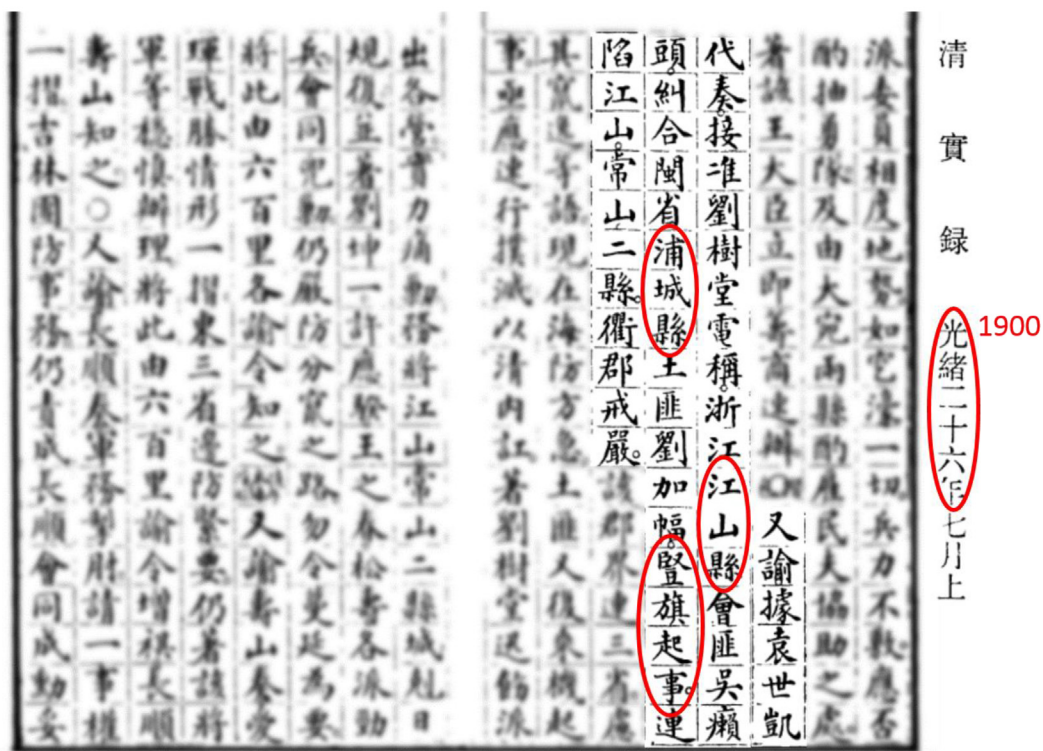
<sup>35</sup> It is nevertheless possible that the two events are implicitly connected in an unobservable manner that is not recorded, causing potential double-counting. We address this by also using the binary indicator of the presence of rebellions in our analysis.

<sup>34</sup> We also verified that our findings are barely affected by including these cases.



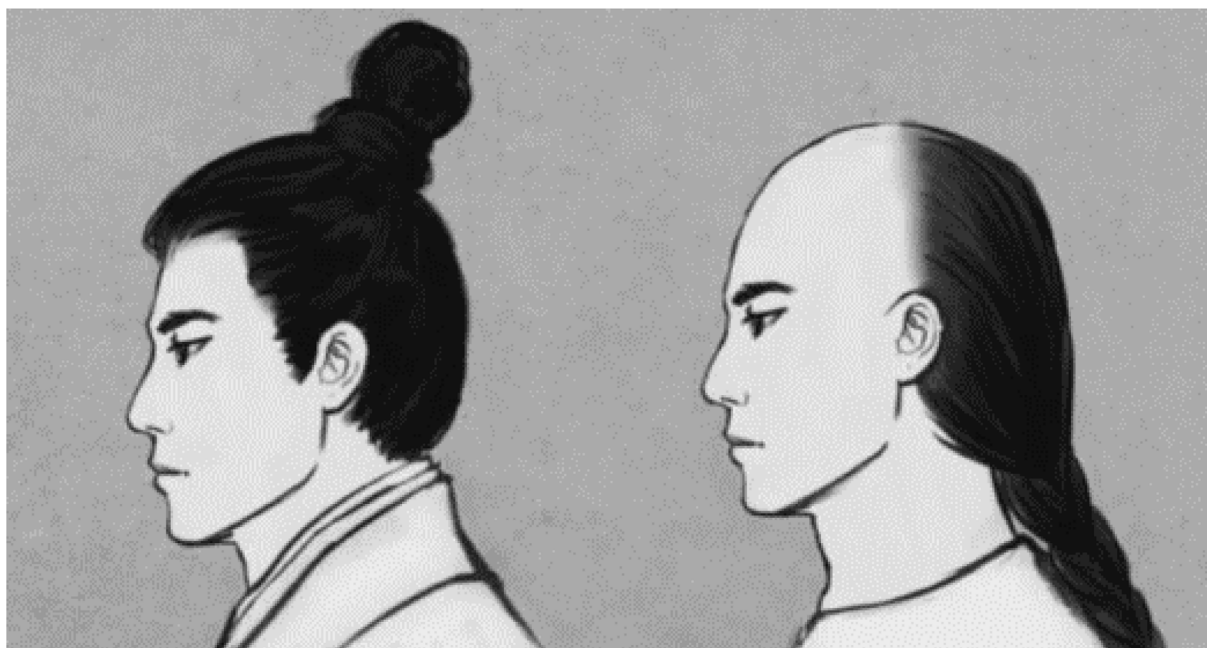


The Cover of *The Records of Qing Emperors (Qing Shilu)*



An Excerpt from *The Records of Qing Emperors (Qing Shilu)*

Fig. A3. Coding Method. The Cover of *The Records of Qing Emperors (Qing Shilu)*. An Excerpt from *The Records of Qing Emperors (Qing Shilu)*.



**Fig. A4. The Tifayifu Campaign.** Note: The left figure shows the costumes and hairstyles in the Ming dynasty; the right figure shows the costumes and hairstyles in the Qing dynasty, for adult men. The illustration was created by artist Nancy Duong in 2013. See: [www.nancyduong.com](http://www.nancyduong.com).

Fourth, in cases where the rebels were reported to spread across multiple counties, we code their actions in each county separately.<sup>36</sup>

Finally, the cases reported in the books might also capture battles between the Qing government and its major enemies (e.g., the British army, the Taiping army, and the Nian army). Unfortunately, our data source does not provide enough information to identify whether a case belongs to any of these events. However, since these events generally started from outside our sample period and lasted for several years, most of the associated actions could be categorized as attacking, defending, retreating, or stationing. Therefore, because we focus on the onset measure, it is unlikely that it would directly capture the campaigns of these historical events.

**Note on generalized spatial two-stage least squares (GS2SLS)**

The spatial correlations in governance are not captured in Equation (1). It is possible that the governance mode of a province might be a function of the interactive learning process among localities close to each other. To operationalize such an influence, we create a spatially weighted lag of the governance status, and the weights are based on whether the respective regions are neighboring provinces. The spatial lag of the adoption status alone, however, does not capture the totality of neighborhood externalities. Each province is also influenced by some unobserved, random characteristics of the neighboring provinces. Formally, the relationship is shown as follows:

$$Y_{it} = \rho WY_{it} + ExtremeWeather_{ij}\beta + X'_{it}\delta + \mu_{it}$$

and:

$$\mu_i = \sigma W\mu_i + \varepsilon_i, i = 1, 2, \dots, N \tag{2}$$

<sup>36</sup> To illustrate, consider a group of rebels that started in county A, attacked counties B and C, and retreated into county D after being repressed. In our data set, county A will receive 1 count of onset, counties B and C will each receive 1 count of attacking, and county D will receive 1 count of retreating.

**Table A1**  
Governance Complexity and Power Checks: GS2SLS Estimation.

	(1) Manchu-Han Duo	(2) Manchu-Han Duo
Extreme Weather	0.038* (0.020)	0.039** (0.020)
Observations	4824	4824
Spatial Autocorrelation coefficient (σ)	0.078	0.383
Adjusted R-squared	0.148	0.214
Additional Controls	No	Yes
Year FE	Yes	Yes
Provincial FE	Yes	Yes

Note: \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. Additional controls include population density, number of Jinshi, and proportions of maize planting.

In equation (2), *i* indexes province, and *t* indexes time. *Y<sub>it</sub>* indicates the ethical choice for the viceroy-governor duo. *WY<sub>it</sub>* is the spatially weighted lag of the governance status for the neighboring province, and *ρ* is the coefficient for the spatial lag. *ExtremeWeather<sub>ij</sub>* is the key explanatory variable, while *X<sub>i</sub>* is a matrix of control variables, including population density, number of Jinshi, and proportion of maize planting. *β* is a vector of coefficients for these covariates. *μ<sub>i</sub>* represents the residual of the model, which is a function of the spatially weighted lag of the residuals of neighboring provinces *Wμ<sub>i</sub>*, plus an error term *ε<sub>i</sub>*.

Because *Y<sub>it</sub>* is a function of *μ<sub>i</sub>*, which means its spatial lag *WY<sub>it</sub>* is also a function of *μ<sub>i</sub>*, the use of standard maximum likelihood estimation for equation (2) faces endogeneity concerns. In this study, the ethnic choice of the viceroy-governor duo is influenced by the decisions of its neighboring provinces, but its own decision may in turn have an impact on the decisions of its neighbors. To deal with the endogeneity problem, we apply the Generalized Spatial Two-Stage Least Squares (GS2SLS) procedure developed by Kelejian and Prucha (1998, 1999, 2004). This approach is a special form of the Generalized Method of Moments (GMM) for models with spatial interdependent variables. It uses exogenous factors

**Table A2**  
Lags and Leads of Extreme Weather.

	(1) Manchu-Han Duo	(2) Manchu-Han Duo	(3) Manchu-Han Duo	(4) Manchu-Han Duo	(5) Manchu-Han Duo
Extreme Weather	0.0893*** (0.0217)	0.0903*** (0.0208)	0.0909*** (0.0211)	0.0923*** (0.0218)	0.0919*** (0.0224)
Extreme Weather (+5)					0.0106 (0.0288)
Extreme Weather (+4)				-0.00598 (0.0196)	-0.00712 (0.0195)
Extreme Weather (+3)			0.0252 (0.0172)	0.0243 (0.0163)	0.0241 (0.0167)
Extreme Weather (+2)		0.0124 (0.0192)	0.00848 (0.0176)	0.00861 (0.0175)	0.00723 (0.0181)
Extreme Weather (+1)	0.0302 (0.0285)	0.0280 (0.0271)	0.0270 (0.0260)	0.0280 (0.0257)	0.0277 (0.0258)
Extreme Weather (-1)	0.0785** (0.0302)	0.0732** (0.0280)	0.0728** (0.0278)	0.0744** (0.0283)	0.0767** (0.0285)
Extreme Weather (-2)		0.0591** (0.0236)	0.0542** (0.0215)	0.0558** (0.0211)	0.0579** (0.0218)
Extreme Weather (-3)			0.0411 (0.0238)	0.0431* (0.0231)	0.0425* (0.0234)
Extreme Weather (-4)				0.00113 (0.0150)	0.00160 (0.0137)
Extreme Weather (-5)					0.000947 (0.0198)
Pop. Density (ln)	0.470*** (0.108)	0.471*** (0.107)	0.476*** (0.107)	0.493*** (0.112)	0.506*** (0.116)
No. of Jinshi (ln)	-0.0605** (0.0272)	-0.0588** (0.0266)	-0.0602** (0.0263)	-0.0604** (0.0278)	-0.0587* (0.0277)
Maize Planting	-0.337 (0.208)	-0.336 (0.208)	-0.337 (0.209)	-0.337 (0.213)	-0.334 (0.216)
Constant	-1.481*** (0.498)	-1.497*** (0.496)	-1.523*** (0.499)	-1.592*** (0.525)	-1.653*** (0.545)
Observations	3,108	3,095	3,080	3,060	3,040
R-squared	0.241	0.243	0.245	0.246	0.247

Note: The minus sign (-) indicates lag periods, and the plus sign (+) indicates lead periods. Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

**Table A3**  
Subsamples Excluding Taiping Rebellion Impacts.

	(1) Manchu-Han Duo	(2) Manchu-Han Duo	(3) Manchu-Han Duo	(4) Manchu-Han Duo
Extreme Weather	0.0683* (0.0334)	0.0783* (0.0426)	0.189** (0.0554)	0.218*** (0.0448)
Pop. Density (ln)		0.433** (0.151)		0.289* (0.130)
No. of Jinshi (ln)		-0.0588 (0.0329)		-0.0476 (0.0275)
Maize Planting		-0.503** (0.216)		-0.839* (0.351)
Observations	1,858	1,858	863	863
R-squared	0.306	0.335	0.527	0.553
Year FE	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes

Note: The results in Columns 1–2 are based on a subsample excluding the provinces directly occupied by the Taiping rebels: Zhejiang, Jiangxi, Hunan, Anhui, and Jiangsu. The results in Columns 3–4 are based on a subsample that further excludes provinces heavily influenced by the rebellion: Guangxi, Guangdong, Henan, Shandong, Zhili, Hubei, and Fujian. The related information is retrieved from Hua (1991).

and their spatial lags as instruments for endogenous regressors. The estimators of GS2SLS are considered to be consistent and asymptotically normal (Kelejian and Prucha 2004), and are not subject to the influence by the “omitted common factors” in the spatial interdependence (Das et al. 2003; Kelejian et al., 2013).<sup>37</sup>

We estimate only the spatial lag of our dependent variable in the first model, and include control variables in the second model.

<sup>37</sup> Although the form of our dependent variables suggests the use of a logistic estimator, the maximum likelihood estimator is invalid when variables and/or errors are spatially dependent (because of the violation on the identically and independent distribution assumption). For the use of linear model in the estimation of spatially dependent dummy outcome, see Wooldridge (2007).

We treat the spatial lag of the dependent variable as the endogenous regressor. The p-values of Hansen J-statistics of over-identification tests for the instruments are not significant across the three models, suggesting endogeneity is a less concerned source of biases.<sup>38</sup> We present the results in Table A1 above. We find the result suggests that the effect of neighborhood externalities is substantial and significant. The chance of a province adopting a Han governor, and a Manchu-Han duo increases by 3.8 percentage points and 3.9 percentage points, respectively, if the neighboring

<sup>38</sup> The Hansen J-test was not developed in the context of spatial models with spatial lags in both the dependent variable and the error terms, but it is still an informative criterion for the over-identification test. For example, see Kelejian et al. (2013).

**Table A4**  
The Assignment of Han Military Officers.

	(1) Han Tidu	(2) Han Tidu	(3) Han Tidu	(4) Han Tidu
Extreme Weather	-0.019 (0.042)	-0.018 (0.042)	-0.019 (0.043)	-0.019 (0.042)
Pop. Density (ln)		0.060 (0.063)	0.059 (0.062)	0.065 (0.075)
No. of Jinshi (ln)			0.023 (0.016)	0.023 (0.016)
Maize Planting				-0.047 (0.148)
Constant	0.759*** (0.005)	0.527** (0.243)	0.511** (0.239)	0.511** (0.223)
Observations	2,752	2,752	2,752	2,752
R-squared	0.297	0.298	0.298	0.299

Note: Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

**Table A5**  
Political Turnovers.

Panel A: Break-down of Political Turnovers				
	(1) H-H to M-H	(2) H-H to M-H	(3) H-H to M-H	(4) H-H to M-H
Extreme Weather	0.017* (0.009)	0.018* (0.009)	0.018* (0.009)	0.018* (0.009)
Pop. Density (ln)		0.038** (0.017)	0.038** (0.017)	0.039** (0.017)
No. of Jinshi (ln)			-0.005 (0.009)	-0.005 (0.009)
Maize Planting				-0.007 (0.019)
Constant	0.024*** (0.001)	-0.135* (0.071)	-0.132* (0.071)	-0.131* (0.071)
Observations	3,117	3,117	3,117	3,117
R-squared	0.146	0.148	0.148	0.148
Panel B: Placebo Tests				
	(1) H-H to M-H	(2) H-H to H-M	(3) M-M to H-M	(4) M-M to M-H
Extreme Weather	0.018* (0.009)	-0.013 (0.010)	0.004 (0.006)	0.0003 (0.010)
Pop. Density (ln)	0.039** (0.017)	-0.035* (0.020)	-0.003 (0.007)	0.0359*** (0.010)
No. of Jinshi (ln)	-0.005 (0.009)	-0.003 (0.004)	0.007 (0.005)	-0.003 (0.006)
Maize Planting	-0.007 (0.019)	0.033 (0.026)	-0.004 (0.011)	-0.003 (0.029)
Constant	-0.131* (0.071)	0.157* (0.085)	0.0145 (0.031)	-0.125*** (0.041)
Observations	3,117	3,117	3,117	3,117
R-squared	0.148	0.096	0.101	0.114

Note: "H-H" indicates "Han-viceroy and Han-governor"; "M-H" indicates "Manchu-viceroy and Han-governor"; "H-M" indicates "Han-viceroy and Manchu-governor"; and "M-M" indicates "Manchu-viceroy and Manchu-governor". Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

province has the same ethnical assignment. The results are consistent with the baseline without considering the spatial correlations.

**Appendix B. The fall of the Ming dynasty: a brief background**

On the surface, the Ming Empire was one of the great empires in Chinese history. It maintained a statecraft that had been inherited over millennia. For instance, its bureaucratic hierarchies were traced back to the Qin Dynasty (221-207 BCE), while the elite recruitment channel - the meritocratic imperial examination system - was initially adopted in the Sui Dynasty (581-619AD).<sup>39</sup>

<sup>39</sup> The system of prefectures and counties (*junxian* system) is a local administrative system in which the central government vertically manages the locality. Under this system, local officials were directly appointed and removed by the emperor, and the localities were under the direct jurisdiction of the central government. The imperial examination system selected outstanding talents through examinations and introduced them into the bureaucratic system, which was the fairest selection mechanism at the time (Jin, 1990).

The Ming Empire was a developed agricultural civilization, with state-of-the-art tools, such as plows and sickles for farming, and waterwheels for irrigation (Xu, 1639). Planting technology was also advanced: sweet potatoes, corn, and other Latin American crops had been introduced nationwide (Chen and Kung, 2016); the multiple cropping technology (double-cropping rice and three-cropping rice) was very mature in the southern region, while cash crop (cotton) cultivation also started in the northern region (Perkins, 1969).

However, several factors conspired to bring down the Ming Empire (Wakeman, 1985; Li, 2017). The 17th century experienced global cooling, causing worldwide famines and pandemics. Even by Chinese standards, the Ming dynasty was on the side of tight government control, which tended to cause large rebellions as the dynasty aged (Chapter 7, Acemoglu and Robinson, 2019). At the end of the Ming dynasty, land inequality was severe, with a large share of peasants on the verge of starvation. Between 1618 and 1655, the Chinese population dropped by around 35%, similar to the scale in Germany and England (p. 15, Li, 2017). The governance



**Table A6**  
Governance Quality and Manchu-Han Duos.

	(1) Manchu-Han Duo	(2) Manchu-Han Duo	(3) Manchu-Han Duo	(4) Manchu-Han Duo
Extreme Weather	1.699** (0.665)	1.515* (0.761)	1.538* (0.760)	1.538* (0.760)
Extreme Weather * Gov. Quality	-0.116** (0.0460)	-0.104* (0.0524)	-0.105* (0.0523)	-0.105* (0.052)
Maize Planting	-0.472** (0.170)	-0.827** (0.289)	-0.816** (0.301)	-0.816** (0.301)
Pop. Density (ln)		0.752*** (0.149)	0.757*** (0.151)	0.757*** (0.151)
No. of Jinshi (ln)			-0.0422 (0.0481)	-0.042 (0.048)
Constant	0.480*** (0.0734)	-2.477*** (0.678)	-2.463*** (0.669)	-2.463*** (0.669)
Observations	1,493	1,493	1,493	1,493
R-squared	0.272	0.324	0.325	0.325

Note: Robust standard errors clustered at the provincial level in parentheses, \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. Governance quality is proxied by the number of local *Changping Granaries*, granaries that offered grains during disasters. Higher numbers of *Changping Granaries* thus indicate more provision of public goods.

of the Ming Empire also became increasingly dysfunctional, with the power increasingly concentrated in the inner court of the Emperors rather than in the hands of professional ministers and scholars, with frequent purging of the latter by the former (Chapter 2, [Wakeman, 1985](#)). The whole government system was extensively corrupt, and the expenditures supposedly for the army's use were largely embezzled, which greatly weakened the ability of the Ming Empire to fight rebellions and invasions. The continued dominance of the Ming Empire for a long time, and the lack of continuous war experiences, likely reduced the motivation for Ming to improve its military technology and army system ([Hoffman, 2015](#)). The burden of government size also became greater and greater. The emperor's descendants, supported by tax money, began at 42 at the end of the 14th century when Ming was founded, to 80,000 in the early 17th century. By the end of the 16th century, the expenditure on male royal family members surpassed the total salaries for all government officials (p 332, [Wakeman, 1985](#)). The collapse of the silver trade with Europe and Spanish America led to strong inflation, further amplifying the human misery in China ([Li, 2017](#)). The economic hardship caused several largest-scale peasant rebellions in China led by capable leaders such as Li Zicheng and Zhang Xianzhong, who invaded the capital city, Beijing, and made the Ming emperor commit suicide.

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