Central Administration and the Rise of Local Institutions: Evidence from Imperial China*

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Abstract

In this paper, I examine whether a strong centralized state facilitated the development of local institutions in Imperial China from 1000 A.D. to 1900 A.D. I exploit plausibly exogenous variations in state administrative capacity induced by regime changes. Using a novel and newly digitized prefecture-level panel dataset, I find that local institutions (strong clans) flourished when state administrative capacity was strong and prevalent. This effect is more pronounced in areas with more garrison stations, suggesting that a strong centralized state fosters local institution development because it can better co-opt local institutions by effectively monitoring them and mitigating any potential threats local institutions might pose to the state.

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1 Introduction

Local institutions are governed by rules and norms established and enforced by social groups within the local region. They play a crucial role in society by influencing cultural norms and, importantly, by often participating in the provision of public goods. They help to overcome the challenges of achieving collective action, allowing communities to benefit from cooperative solutions. However, it remains unclear what drives cooperative behavior, encouraging the establishment of local institutions and the provision of public goods in local regions.

Understanding these questions is vital, as local institutions shape individuals' beliefs and behaviors, influence cultural changes, and contribute to the formation of social norms (Putnam, Leonardi, and Nanetti, 1994; Greif, 1994; Greif and Tabellini, 2010, 2017; Enke, 2019). Therefore, they can have long-term implications for political behavior as well as economic and social development.

This paper explores one possible explanation: the role of central administration in the development of local institutions. Theoretically, the impact of central administration on the development of local institutions is ambiguous. Fukuyama (1995) and Putnam, Leonardi, and Nanetti (1994), among others, argue that a centralized state crowds out local institutions as it performs its functions, including public goods provision, disaster relief, and more. The Norman state in southern Italy is an example of this. However, others, such as Streeck and Schmitter (1985), Vogel (1986), and Ostrom (1990), argue that the state can transform perceptions of the costs and benefits of cooperation, thereby leading to the provision of collective goods and the emergence of local institutions. A more recent study by Acemoglu and Robinson (2017) suggests that this relationship can be ambiguous and depends on initial conditions.

Although it may not be possible to provide a definite answer to this relationship that transcends specific contexts, this paper provides one of the first empirical investigations of the relationship between the central administration and the development of local institutions in Imperial China.

Investigating this question empirically presents two main challenges. The first is measuring the emergence of local institutions. These institutions can exist in many forms and function in various ways, making it difficult to assess their presence and systematically compare variations across space and time. Powerful clans in Imperial China during the second millennium (about 1000 A.D. to 1911 A.D.) provide a good opportunity to systematically measure local institutions. The clan was the most important grassroots-based local institu-

tion in the core region of China during this period (Greif and Tabellini, 2010, 2017; Xu and Yao, 2015; Fukuyama, 2012). A powerful clan in historical China was capable of providing relief to the poor, elders, orphans, and members in need; educating the young; conducting religious services; building bridges; and constructing dams. Clans had their own rules on moral standards, property rights, and justice, which they could enforce effectively. Notably, many clans possessed communal clan lands, providing a source of communal funding similar to today's trust funds, enabling them to offer these collective goods. Therefore, in this paper, I focus on clans that owned communal land, as this signifies their power and cohesiveness.

The second challenge is measuring the strength of the central state administration and identifying plausibly exogenous variations in its power, given that local institutions might strategically interact with the state or even play a role in state formation. Regime switches during the second millennium in Imperial China provide an excellent setting to address this issue. Each regime change involved redrawing provincial boundaries and relocating provincial capitals. Areas closer to the provincial capital (political and administrative center) would have experienced stronger state influence, but they might have lost this influence when the distance to the provincial capital increased due to a regime switch. Importantly, provincial boundaries were more like "administrative accidents" rather than deliberate delineations based on human activities (Skinner, 1977); and provincial capital relocations were primarily driven by concerns of military defense against invaders and the efficient transmission of information and resources. Therefore, changes in proximity to provincial capitals resulting from regime switches were plausibly exogenous to local institutions, allowing me to use these changes as a proxy for the strength of central state administration.[1]

I construct a prefecture-dynasty panel dataset of 267 prefectures in the core regions of China (China Proper) during the second millennium, spanning three dynasties: Song, Ming, and Qing.[2] The panel feature allows for the inclusion of prefecture fixed effects, which control for prefecture-specific influences on local institution establishments. This can help isolate the effect of state administrative capacity from other time-invariant factors such as culture and geography. I focus on within-prefecture variation and ask whether moving a prefecture closer to the provincial capital—thus exposing it to stronger state administration—increases or decreases the probability of establishing a new powerful clan (local institutions).

To address concerns that local institutions might influence the location of provincial

[1]Empirically, I show that changes in proximity to provincial capitals are not correlated with population density or clan land establishments in the previous dynasty.

[2]Please see the shaded area in Figure A1 in the appendix for the China Proper region. The Yuan dynasty also appears in the second millennium; however, it is not included in the analysis due to the unavailability of data. Detailed discussions are provided in Section 2.

capitals and boundaries, or that the state might strategically position these capitals and boundaries to better control local institutions, I provide empirical evidence showing that proximity to provincial capitals was not correlated with the existence of local institutions in the previous dynasty. Additionally, I show that proximity to provincial capitals was orthogonal to population density at the beginning of the dynasty, when the new boundaries and provincial capitals were established. This further suggests that these decisions were not related to human activities.

I find that more local institutions in each dynasty emerge where state administrative capacity is stronger (i.e., closer to the provincial capital). Specifically, if a prefecture's distance to its provincial capital doubles (increases by 100%), its probability of having a local institution established decreases by 9.4%, a 30% change from its mean. This finding remains robust when controlling for population density, which helps isolate the effects of both population size and economic development. The result is also robust to various specifications, including grid-level analysis and models that take spatial autocorrelation into account.

We can use historical Wuhan as an example to illustrate the magnitude of this finding.[3] Wuhan was near the provincial border and far (about 210 km) away from its provincial capital (Jiangling Fu) in the Song dynasty, but it gained provincial capital status in the Ming and Qing dynasties. This status increased Wuhan's probability of having local institutions (powerful clans) established by 30%.

What might explain the positive relationship? Like other large empires of the time, Imperial China struggled to govern its vast territories and reach local regions and inhabitants effectively. To address these challenges, the state often enlisted the help of local elites, co-opting them as agents and delegating various tasks to them. This delegation inevitably increased the power and prestige of the local elites (Mann, 1989). As a result, these elites were incentivized to invest in local institutions, thereby consolidating their growing power.

Aware that these local elites could eventually gain significant political power, outgrow their roles as agents, and even challenge the state, the state likely chose to exercise this co-option strategy in regions where it could confidently monitor the elites, despite the potentially lower benefits from co-option in these areas.

To demonstrate this state co-option channel, I first show that local elites played a significant role in administrative tasks such as public goods provision, particularly in areas where state administrative capacity was stronger. Furthermore, the impact of state administra-

[3]Wuhan was called Ezhou in the Song dynasty and Wuchang in the Ming and Qing dynasties. The prefecture boundary also changed slightly from Ezhou in the Song dynasty to Wuchang in the Ming and Qing dynasties. This will be discussed in detail in section 2.

tive capacity on the development of local institutions was more pronounced in regions where monitoring local elites was easier, such as in areas with more garrison stations. These findings also suggest that weak state administrative capacity hindered the development of local institutions, limiting their ability to build social capital and access goods and services, which may have had long-term implications for social and economic development.

To the best of my knowledge, this paper is the first to empirically demonstrate the positive relationship between state administrative capacity and the development of local institutions using unique historical panel data during the second millennium in Imperial China. This paper provides the first empirical evidence to the state and civil society debate by showing their possible complementarity. Acemoglu and Robinson (2017) call this complementarity *inclusive institutions*, with their model showing that an equilibrium point can be reached where the state and civil society are initially in balance, which triggers an ongoing competition whereby they both become stronger. This work empirically shows a similar but slightly different story: a relatively strong centralized state (but not absolutely strong since it is still limited in its capacity to rule local regions) creates incentives for civil society to grow in its administrative process.

More broadly, this paper contributes to understanding the long-term legacy of historical institutions. Many scholars have discussed that social capital is the channel through which historical institutions have made a long-run impact on contemporary outcomes (Dell, Lane, and Querubin, 2018; Chaudhary, Rubin, Iyer, and Shrivastava, 2020; Lowes, Nunn, Robinson, and Weigel, 2017). Dell, Lane, and Querubin (2018) finds that a historically strong state has a long-run effect on local cooperation and civic engagement cross-sectionally. This paper complements their findings by showing a contemporaneous effect using a historical panel dataset, which supports their arguments on the persistent effect. Xue (2020) demonstrates that historical state repression impedes social capital, resulting in persistent long-term effects. This paper complements her findings by showing that state administration can also incentivize locals to invest in social capital. These two results can be seen as two equilibrium dynamics between the state and local. When the state perceives that local elites are cooperative and their interests are aligned, they become co-dependent, and the state can incentivize local development. Conversely, when the state perceives local elites as threats, it takes repressive actions to restrain social capital.

This paper is also related to the broad literature on state co-option. Existing literature has shown the importance of co-opting the local elites in helping local governance and the effectiveness of co-opting local elites in managing conflicts and tax collection (Balan, Berg-

eron, Tourek, and Weigel, 2020; Basurto, Dupas, and Robinson, 2020; Acemoglu, Reed, and Robinson, 2014; Acemoglu, Cheema, Khwaja, and Robinson, 2020; Mustasilta, 2019). This paper illustrates an unintentional and possibly positive outcome of co-option: the development of local institutions. A mechanism through which co-opting local elites have been found highly effective in administering local affairs is that co-opted local elites also invested in local people to consolidate the power and prestige they receive from being a state agent. Additionally, the literature reveals that the state can tap local institutions and local power to aid the development of the state (Satyanath, Voigtländer, and Voth, 2017; Acemoglu, Reed, and Robinson, 2014). This paper shows that the state can also aid the growth of local institutions.

Additionally, this paper provides new insights into understanding Imperial China's political logic in state-building and the state-elite relationship (Wang, 2021b,a; Chen, Wang, and Zhang, 2021; Sng, 2014; Bai and Jia, 2021). This work highlights the role of the centralized state in developing local institutions and illustrates the logic behind co-opting local institutions when governing local regions.

Finally, this paper also contributes to the literature on the costs of being located far away from the state administrative center. Existing literature has documented the economic disparities caused by greater distance (Asher, Nagpal, and Novosad, 2018; Fafchamps and Wahba, 2006; Feyrer, 2009). This paper implies that being away from the administrative center not only has economic costs but also social costs, possibly local cooperation and thus the formation of social capital.

The rest of this paper proceeds as follows. Section 2 provides a brief background on regime switches, provincial boundary changes and provincial capital relocations, and the clan as a local institution. Section 3 gives an overview of the data used in this paper. The empirical framework and empirical results are presented in Section 4 and Section 5 respectively. Section 6 concludes.

2 Background

This section provides a brief background on provincial boundaries changes and provincial capital relocations involved in regime switches and discusses the clan as a local institution. Four imperial regimes existed during the second millennium, namely the Song (960–1279), Yuan (1279–1368), Ming (1368–1644), and Qing (1644–1911) (see Figure 1 for a timeline). The Yuan dynasty is not included in this paper because the clan, more specifically clan land,

had limited development during the dynasty. More crucially, clan land data is unavailable for the Yuan dynasty.[4]

2.1 Regime Switches, Provincial Boundaries, and Capitals

2.1.1 Levels of Administrations

A three-tier administrative system (county-prefecture-province) has been highly stable since the Song dynasty (960 A.D.). The central state directly appointed and rotated officials at all levels, although provincial governors often played a role in recommending promotion, demotion, or removal of their subordinate officials. The "hometown avoidance" rule was employed when appointing officials at all levels to avoid nepotism. Officials were not assigned to their hometown province and would not be appointed close to where their family members were appointed, if any.

The province is the top tier of the administration system. The most crucial node is the provincial capital, through which the central state can connect with local regions within the province.[5] The provincial capital has two primary roles: (i) serving as the central administration for fiscal affairs, judicial matters, and welfare issues within a province; and (ii) transferring resources and information between the central government and all the prefectures within a province. The provincial-level administration is often seen as representing the emperor. Provincial governors are responsible for supervising the performance of prefecture prefects and county magistrates, dispatching supervisors to regularly monitor and evaluate the local administrations. As the Emperor Yong Zheng once said: "the provincial governors are representing me as the emperor to govern the local matters. So do the vice-governors who are also representing me as the emperor to carry out my orders."

Prefecture prefects and county magistrates received orders from their provincial governors and focused on local issues, including local peace and security, tax collection, population registration, and judicial affairs. As higher-level administrative officials, prefecture prefects took care of more significant issues than county magistrates. For example, county magistrates only adjudicated minor crimes, and most cases had to be settled in the prefecture court. In the case of major crimes, the provincial governors needed to be consulted and were responsible to render the final decision, while a death sentence required approval from the central government. On the other hand, due to the "hometown avoidance" rule, prefects and mag-

[4] According to Zhang (1991), the growth of clan lands paused throughout the Yuan dynasty due to the nature of Mongolian rule, with fewer than ten well-known clan land establishments. This pause resulted in a lack of spatial variation for analysis.

[5] Figure A2 shows the location of provincial capitals in all three dynasties.

istrates were unfamiliar with local conditions and usually faced difficulties reaching the local populations. Therefore, they heavily relied on local elites to carry out their administrative duties (Chu, 1962; Bai, 2003).

2.1.2 Regime Switches, Provincial Boundary Changes and Provincial Capital Relocations

Each regime change involved redrawing provincial boundaries and relocating the provincial capitals. Hence, the proximity changes used in this paper come from these two sources of variation: the province to which the prefecture belongs to and the capital it is distant from. In what follows, I will discuss the determinants of such changes.

Provincial Boundary Changes

Provincial boundaries were drawn at the beginning of each dynasty when the new rulers had scant knowledge of local conditions. Those borders usually persisted until the end of the dynasty, with only rare exceptions that changed in between dynasties (Tan, 1982; Bai and Jia, 2021).

In early Chinese history, administrative and territorial boundaries were typically aligned with natural features like rivers or mountains, a principle known as "following the forms of mountains and rivers." The Song dynasty (960–1279 A.D., the first dynasty in my sample) also followed this practice when delineating provincial boundaries. While this approach was natural, it often led to a large number of provinces, which could be costly to govern. (See detailed explanation in Appendix II.I) Hence, the Song dynasty had the smallest territories but the largest number of provinces.

When the Mongols came to power during the Yuan dynasty (1277–1368 A.D.), the vast geographic scale of the empire made using natural boundaries very inefficient. Hence, they embraced a different principle known as "interlocked like dog's teeth," whereby boundaries encompassed rivers and mountains within provinces. The main objective was to prevent regional power-holders (such as provincial governors, dukes, and military commissioners) from gaining too much local autonomy and posing a military threat to the regime, all while avoiding the creation of too many small provinces and keeping administrative costs low (Ge, 1985; Zhou, 1998; Sng, Chia, Feng, and Wang, 2018).[6] It is worth pointing out that these regional power-holders were referring to high-level government officials who held regional

[6]See Appendix II.I for a detailed discussion on the logic of both principles and why the principle was changed in the Yuan dynasty.

military and administration imperium. They were different from clan leaders, who usually were grass-root local elites with gentry status.

Figure A3 uses the Yangtze River as an example. The Yangtze was used to create provincial boundaries during the Song dynasty (pre-Yuan, left panel), while in the Ming and Qing dynasty (post-Yuan, middle and right panels, respectively), the Yangtze River was interlocked within the province. Zhou (1998, 2013) documents many other examples, including the Qin Mountain and the Taihang Mountain .

The "interlocked like dog's teeth" principle was inherited by the Ming dynasty (1386–1644 A.D.) and the Qing dynasty (1644–1911 A.D.) upon their ascent to power. This led to significant border differences between the Ming and Song dynasties. Additionally, the Qing dynasty further made adjustments based on those of the Ming dynasty, including dividing large provinces into halves.[7] The location of the provincial boundaries was set merely to prevent provincial power holders (provincial governors) who had military power to challenge the emperor's supremacy, and as a result, the borders failed to consider local conditions. Hence, provincial boundaries in late Imperial China were widely considered as "administrative accidents," as they seldom coincided with culture or any human and economic activities in the local regions (Skinner, 1977; Zhou, 1998, 2013).[8]

Locations for Provincial Capitals

A major role of provincial capitals was to connect the central government with all prefectures within the province. Proximity and connectivity were a primary concern when choosing provincial capitals. Bai and Jia (2021) illustrates that the central state would weigh the trade-off between governing a province (proximity to all prefectures within the province and hence centroid of the province) and connecting to the central state for transferring and delivering resources and information (proximity to the imperial capital), and choose the provincial capitals that balance the two. Hence, as the provincial boundary changes, the provincial capitals would require relocation.

As provincial capitals were the centers for fiscal and judicial affairs, geographic suitability to accommodate frequent, high-volume visitors was a significant factor to consider (He, 2009; Guy, 2017). Hence, provincial capitals were usually located on a plain with a low elevation and beside rivers or canals that offered natural advantages for transportation. A vital con-

[7]This includes dividing Jiangnan province into Jiangsu province and Anhui province (this case is depicted in Figure A3); dividing Shangxi province into Shangxi province and Gansu province; and dividing Huguang province into Hunan province and Hubei province.

[8]See Appendix II.II for more discussions on the exact location of the provincial boundaries.

sideration was also that the capitals must be agriculturally suitable to produce sufficient food for traders, visitors, and bureaucrats. Proximity to rivers also ensured sufficient water supply for irrigation (He, 2009; Guy, 2017).

Military defense was another major concern when choosing provincial capitals. Prefectures that geographically had advantages for military defense, such as being located at the foot of a hill or beside a major river, were the primary candidates for provincial capitals (Guy, 2017).[9] As such, any invaders would not easily conquer any provincial capital. For example, Xi'an has three sides surrounded by mountains and its east side faces the Yellow River. Guiyang, the capital of Guizhou province, shares similar features. Almost all provincial capitals had a major river nearby, probably because rivers offer all the key benefits mentioned above.[10]

2.2 The Clan

A clan consists of several patrilineal households who trace their origins to a *self-proclaimed* common male ancestor. In some cases, clans were not related by blood. During the late Qing dynasty, some households with distinct surnames who knew that they did not share the same ancestor also identified themselves as a clan.[11] The lineage head was often a well-reputed person within the clan who oversaw all internal affairs, including justice and fiscal-related issues. He usually was a local elite who passed the civil exam and earned gentry status.

The clan as a local institution has been shown to have positive short- and long-run effects. These include serving as risk-sharing institutions and promoting economic development, deterring government land-taking and other government expropriations, as well as promoting local governance and administering the provision of public goods when democratic elections were introduced (Chen and Ma, 2021; Cao, Xu, and Zhang, 2020; Zhang and Zhao, 2014; Xu and Yao, 2015), although recent research also shows that while the clan provides short-term benefits such as risk-sharing and mutual insurance, it may lead to long-term costs, such as inhibiting the development of formal banking (Chen, Ma, and Sinclair, 2020). In what follows, I provide a brief overview of the development of the Chinese clan and its institutional roles.[12]

[9] Major rivers in China flow from the west to the east, while all the external military threats come from the north. Therefore, a major river would stop the enemy's invasion rather than facilitate their arrival.

[10] In my data, only three provincial capitals across three dynasties do not contain a major river. One of the three is a coastal city.

[11] There were even cases where several households altered their surnames to claim themselves to be a clan.

[12] Clans were not the only local institutions that provided public goods in Imperial China. In Appendix II.III, I provide a brief discussion on other local institutions and why they are less suitable for this study.

Clan Development Since the Song Dynasty

The clan is deeply rooted in Chinese history, although it was solely aristocratic and nobility-based for a lengthy historical period. It was the privilege of the aristocracy to hold activities such as ancestor worship rites and genealogies compilation. However, by the end of the Tang Dynasty (618–907 A.D.), wars and massive migrations had destroyed the social structure, aristocracy, and nearly all existing clans. Order was not restored until the Song Dynasty was several decades old. The Song philosopher Zhang Zai (1020–1077) was known to be the first to stress the role of clans in restoring social order. A few decades later, Zhu Xi (1130–1200), a well-known philosopher, authored the book *Jia Li* [Family Rites]. In this work, Zhu provided practical guidelines for establishing clans, such as constructing ancestor temples, worshipping ancestors, and establishing communal clan land. These guidelines were considered influential in Chinese history and were widely followed.

Meanwhile, the rise of *Keju* (a civil exam system used to choose officials) since the Song Dynasty created a large space for clans to flourish and turned clans into commoner-based institutions. First, *Keju* selected virtually all levels of government officials based on merit rather than family background. People who passed the entry level of the civil service exam would be admitted to the gentry class and would be entitled to various benefits and privileges, including exemptions from tax and corvee labor, and high social status.[13] In addition, as the intergenerational succession of rank, advantages, and power, and hence aristocracy, were broken down by this exam system, the social standing, authority, and privilege obtained through the civic test became less stable. This gave additional incentives for those who reaped the benefits after passing the civil service exam to invest in their clan to strengthen their social standing with the hope of helping other members in the lineage pass the exams and support themselves. Liu Zai, who obtained *Jinshi* (the highest degree) in the Song dynasty's civil exam, expressly said that "investing in a clan is the only way to retain wealth."

Therefore, from the Song dynasty, the clans became commoner-based. Many commoners started to organize their clans following Zhu Xi's guidelines. A typical clan would have their own rules enforced by their lineage head. Justice and local affairs were usually dealt with in the lineage hall, and local officials would not intervene. Different households within a clan

[13]Historical China divided people into four classes: scholar, farmer, artisan, and merchant. Educated scholars who passed the civil service exam would obtain high status and prestige in society, which could be reflected in many aspects. For example, commoners must greet officials on bent knees, while members of the gentry do not. Moreover, in Imperial China, the state would often need labor for military and construction projects such as roads, canals, irrigation systems, and more. Hence, the state would regularly conscript free labor (corvee labor) and locals had an obligation to meet the state's demands by law. However, the scholars who passed the civil service exam, and often their family members, were exempted from the forced labor.

would help each other with farming, cultivation, and other economic activities. An organized clan would document members' accomplishments and contributions in their clan genealogy with the goal of encouraging individuals to contribute to their clan and to incentivize collectiveness.

A small percentage of clans held communal assets, with communal clan land as the most common. This resource provided clans with communal funding for lineage hall repairs, large-scale worship ceremonies, relief for the poor and disaster relief, the operation of clan schools, and other organized public or club goods provision. The lineage head would be in control of funding, and clan members could request relief funds when needed. As Fei (1986) describes, "[A clan] is a community inside a society." The clan then became a core part of the local support system, a safety net, a provider of local public goods, and a facilitator of many other collective actions.

The development of the clan was limited during the Yuan dynasty, partly due to the nature of the Mongolian ruling regime, which prohibited the establishment of local organizations.[14] During the Yuan dynasty, only a few parcels of clan land were documented. According to Zhang (1991), there was a pause in clan land growth throughout the Yuan dynasty, with fewer than ten well-known clan land establishments.

During the Ming and Qing dynasties, clans and clan land growth flourished. Clans were prevalent across China at the end of the Qing dynasty (Feng, 2008).

Communal Clan Land

Possessing communal land ensured that a clan had a steady source of communal funds to offer club goods and public goods. Clans with communal clan land were therefore perceived as strong, united and cohesive. In this paper, communal clan land is also utilized as an indicator of powerful clans and consequently serves as the measure for local institutions.

The first clan land was established in 1049 A.D. by Fan Zhongyan (989–1052 A.D), who donated his personal land to his clan. The clan began in two counties in the Suzhou prefecture, sized about 6 *mu* (Zhang, 1991).[15] The goal was to "help members regardless of relationship. Everyone could have food and clothing, as well as funds for weddings or funerals." (Zhang, 1991). Afterward, ever more clans followed suit and began to create clan land. Most of the clan land was donated by one or a few clan members, who would gain

[14] Even though the Qing dynasty, similar to the Yuan dynasty, was also ruled by ethnic minorities, they were known to be more integrated to ethnic Han culture and therefore, clans could still be prosperous during the Qing dynasty.

[15] mu is a unit for land size. 1 $mu = 666.67m^2$

respect, status, and power in return.

Establishing clan land was frequently viewed as a necessary strategy for unifying clan members and consolidating the authority of elites. Qing philosophers Fang Bao and Gu Yanwu both believed that the clan land from Fan, which was also expanded by the future generations and eventually reached around 5,000 *mu*, is the key reason why Fan's descendants were all well off and their clan was effective in preserving internal order as well as influencing external affairs (Fang, 1985; Gu, 1998).

Clan land was usually lent out for others to cultivate and receive rent, but sometimes it could also be collectively cultivated by the clan members. In either case, the return from the land would be put into a communal fund. The state made it illegal for any clan member to sell their communal clan land. Any attempt would be severely punished (Xu, 1957; Huai, 1999).

State and Clan

The progress of centralization during Imperial China and the expansion of the territories resulted in a heavier demand on bureaucratic officials. The state's fiscal capacity, on the other hand, did not allow for a massive expansion in statesmen (Zelin, 1992).[16] In such a scenario, the state was forced to rely on local institutions, such as clans, and to coordinate with local elites.

Consequently, the states and emperors attempted to coordinate and enhance the benefits of founding clans and lineage heads, even though they were not directly involved in clan formation. There were many such examples. During the Song dynasty, emperors allowed and encouraged commoners to record genealogy and form clan trusts. In the Qing dynasty, the Emperor *Kangxi* stated in the *Sacred Edict of the Kangxi Emperor* that "consolidating clans can bring harmony in the society" and encourage everyone to "establish lineage temples for worshipping ancestors, clan schools for educating next generations, clan land for having funds to relieve the poor, and compiling genealogy for connecting the distant."

In addition, the imperial states built their economic system and governed human interactions using Confucianism, which placed a strong emphasis on filial piety. This practice also legitimized clan rules and clan orders. For example, states enacted laws that bolstered the clan hierarchy. The law was written such that sons must obey their parents, while juniors had to obey their elders. Seniors' faults would be forgiven, but juniors' mistakes would be punished harshly. These laws favored the elderly, the lineage head, and other local elites as

[16] In fact, Imperial China had a relatively low proportion of government officials, as has been extensively reported.

well as granted them authority, status, and prestige. As a return, clans carried out duties including tax collection, social orders, and peace within the clan, among other things, as well as local public goods provisions such as dams, roads, bridges, and more (Feng, 2008).

3 Data

3.1 Clan Land Data

Clan land data have been collected by Li and Jiang (1998), including information on prefectures or counties where newly established clan land was located during the Song, Ming, and Qing dynasties.[17] The primary information on these historical clan lands was recorded in various places, including local gazetteers, clan genealogies, biographies, and others. Most of these were recorded in the private sector, such as genealogies and biographies, while local official records such as county or prefecture gazetteers also contributed some data.

However, despite Li and Jiang (1998) making exhaustive efforts to compile the list, this data does not constitute a census of all clan lands. Consequently, there may be measurement errors in determining the number of clans with land in each prefecture during each dynasty. To mitigate the potential impact of this issue on my empirical analysis, I use a binary variable. This variable takes the value of one if a prefecture has at least one recorded clan land established in the corresponding dynasty, indicating a *historical prefecture with powerful clans*. The idea is that if a prefecture has many strong clans that established clan lands, at least one of these pieces of land would have been documented by Li and Jiang (1998).

Figure 2 depicts the spatial distribution for *historical prefectures with powerful clans* in each dynasty (i.e., prefectures with at least one clan land recorded in the corresponding dynasty). Firstly, it is noteworthy that the number of prefectures with powerful clans increased over time, aligning with the perspectives of other historians (Zhang, 1991; Feng, 2008; Chang, 1994). Furthermore, the data indicate that these *historical prefectures with powerful clans* are notably concentrated in southeastern China, where clan culture is commonly prevalent. Nonetheless, there are still variations in northern and northwestern China.

[17] See Figure A4 in the appendix for a snapshot example of the raw data for the Ming Dynasty. Li and Jiang (1998) did not collect data for the Yuan dynasty. This is probably because clan land did not develop much during the Yuan dynasty, as mentioned previously.

3.2 Administrative Boundaries and Provincial Capitals

Administrative boundaries, including prefecture and provincial levels, and provincial capitals for Ming and Qing dynasties, are provided by The China Historical Geographic Information System (CHGIS, 2016). I digitize prefecture and provincial boundaries of the Song dynasty from *The Historical Atlas of China* (Volume VI) (Tan, 1982), which is the most comprehensive as well as the most widely used map for historical China.[18]

I restrict my study area to the core region of China (which is often called China Proper by historians, see Figure A1 for reference), where more than 98% of the population is ethnic *Han*, and clans are the relevant local institutions.[19] China Proper regions include territories within the Great Wall to the north, the thick tropical rainforests of Indochina to the south, vast mountain ranges—including the Himalayas—to the west, and the Pacific Ocean boundary to the east. Typically, China Proper was referred to as the Qing eighteen provinces or the Ming fifteen provinces, which are equivalent to nineteen provinces and four province-level municipalities in today's P.R. China.[20]

3.3 Prefecture Panel Construction and Proximity to Provincial Capital

Although prefecture boundaries were relatively stable over regimes, many changes also occurred. To construct a prefecture panel, I map prefecture boundaries in each dynasty to a fixed layer—P.R. China 2010 prefecture boundaries—in the analysis.

How to transform the dummy variable that indicates *historical prefectures with powerful clans* onto the P.R. China 2010 prefecture boundary? I construct the following two variables for each dynasty: (i) a dummy variable indicating a prefecture is a clan prefecture if *historical prefectures with powerful clans* cover more than 50% of its territory; that is, historical prefectures cover the majority of a prefecture's land with powerful clans. I also explore alternative thresholds to show that the results are robust to different cutoffs. (ii) a continuous variable, ranging from 0 to 1, measures the proportion of a prefecture that overlaps with the *historical prefectures with powerful clans* in the original dynasty.[21] In a robustness check, I also map

[18] *The Historical Atlas of China* is also the base map for the CHGIS project.

[19] Despite focusing on China Proper regions, there were still ethnic minorities where clans were not relevant local institutions. However, since those ethnic minorities rarely migrate, this effect would be captured by prefecture fixed effects.

[20] That is, today's China excluding Liaoning, Jilin, and Heilongjiang provinces; Inner Mongolia; Tie-bat; Xinjiang; and Qinghai. All territories in the Song dynasty are within the China Proper regions.

[21] Appendix III illustrates this process with examples.

historical prefectures into fixed grids whose size is close to the average prefecture size. The results are very close, both qualitatively and quantitatively.[22]

To calculate the proximity of a prefecture to its provincial capital, I need to assign each prefecture in P.R. China 2010 to a historical province in each dynasty. Due to the prefecture boundary changes, it could be the case that a prefecture in the base layer (P.R. China 2010) spans more than one province in each dynasty. In such cases, I allocate the prefecture to the province that has the biggest share of its territories.[23]

Finally, *Proximity* is defined as the negative log-distance between the prefecture centroid to the provincial capital of the assigned historical province in each dynasty.[24]

In this paper, *proximity* to provincial capital is used as a measure of state administrative capacity. The idea is that the state could insert more influence and carry out administrative duties more easily in places closer to provincial capitals, whereas it would be much harder to do so in places further away from their provincial capitals due to higher communication costs. One supporting evidence of this idea is that more courier stations were built near provincial capitals to facilitate information transmissions.[25] This is illustrated on Table A1 using the information on courier stations in the Ming Dynasty.

3.4 Auxiliary Data

Population density data is digitized from Liang (1980), *Historical Statistics of Population, Land and Taxation in China* and Ge (2013) *China Population History*. These books provide prefecture-level population density data. In this paper, I use the population density of the years 980, 1394, and 1776, which are the earliest available data in the years covering the Song, Ming, and Qing dynasties, respectively.[26] To construct the prefecture-dynasty panel, I then calculate a weighted average population density based on the area covered to

[22]The result for grid-level analyses can be found in Table A3 in the Appendix.

[23]Results are the same if I assign the prefecture to the province based on where the prefecture centroid locates.

[24]In the Song dynasty, to avoid provincial leaders gaining too much power, the emperor divided provincial capital duties into judicial and fiscal and might allocate to different capitals. Indeed, half of the provinces have two provincial capitals. In this case, I use proximity to the fiscal capital because it is the major capital and is more stable Tan (1982). Moreover, the clan measure—clan land—is more related to fiscal administration. My results still hold if I use the proximity to judicial capitals (see Table A4 in the appendix).

[25]These courier stations were built for couriers–who carried official communications–to change horses and get rested.

[26]These years correspond to the 21st year, the 26th year, and 134th of each dynasty.

map population density from the historical prefecture to the base layer (P.R. China 2010).

$$PopDen_{it} = \frac{\sum_{j=1}^{J} Area_{ijt} * PopDen_{jt}}{Area_i}$$

Clan genealogical data is from *The Comprehensive Catalogue of Chinese Genealogies* edited by Wang Heming (Wang, 2009). Wang Heming and his team have cataloged roughly 51,200 genealogy books from the end of the first millennium (the beginning of the Song Dynasty) to the present day in a print registry. This effort represents the most comprehensive registry of known Chinese clan genealogies to date. The data are collected from local and national archives and libraries, private holdings, and overseas collections, including all 10,000 microfilmed genealogy records archived by the Genealogical Society of Utah—the most extensive overseas collection of Chinese genealogy. This collection can therefore be considered as a census for Chinese genealogy.

The data used in this paper is digitized by Dincecco and Wang (2021), which extracts information on each clan's location, the year that the genealogy book was compiled, the number of volumes in the genealogy books, the lineage original ancestor's location, and their migration year. I use this dataset to complement my clan land data to further investigate the clan migration history and clan activities at an intensive margin. Specifically, I extract the following two sets of information and construct the corresponding prefecture-dynasty panel: (i) prefecture and dynasty where the genealogies were compiled, and (ii) prefecture and dynasty to which the ancestor migrated.[27]

Garrison stations played a crucial role in mobilizing military resources, monitoring and controlling border areas, and defending against invasions. Their locations were relatively stable during each dynasty. I collect data on the number of garrison stations for each prefecture in the Song dynasty from Wang (2011), the CHGIS (2016) for the Ming dynasty, and twenty-five histories (Zhao, 2002) for the Qing dynasties respectively.

Schools are analyzed in this paper as a type of public good. I focus on two different types: academy schools (*shuyuan*) and county schools (*xianxue*). Academy schools are primarily funded by private contributors. Ji (1996) offers a comprehensive list of all academy schools

[27]This data provides the county in which the clan is located in P.R. China, which allows me to directly construct the panel data in P.R. China 2010.

established in Imperial China, covering all dynasties within the sample period. In contrast, county schools are established and maintained by the state to prepare students for civil service exams and train future officials. Zhou (1996) and Guo (2014) provide information on county schools, including their locations and whether they were newly built or renovated from previous dynasties, for the Song and Ming dynasties. Unfortunately, data on county schools for the Qing dynasty is not available.

Jinshi and Juren were scholars who passed civil service exams in Imperial China. Jinshi succeeded in the highest national-level exam, while Juren were successful candidates in the provincial examinations. The China Biographical Database (CBDB) at Harvard University provides records of all Jinshi and Juren from the Song, Ming, and Qing dynasties, including information on their hometown origins. For the purposes of this paper, I aggregated the number of Juren and Jinshi from each prefecture of origin by dynasty.

Agricultural suitability indexes data, provided by FAO (2012) GAEZ data portal version 4, are also used in this paper as control variables. The data are originally available at the grid level, which can be mapped into fixed boundaries used in the analysis and provide a cross-sectional variation. These suitability indexes use a rain-fed water supply and a low level of inputs.

3.5 Summary Statistics

Table A2 presents the summary statistics. Clan land became more prevalent over dynasties. Recall that I define proximity as the negative log-distance between the prefecture centroid to its provincial capital. The Song dynasty had relatively close proximity as it had smaller territory but was divided into more provinces. In contrast, on average, the Ming dynasty had the furthermost proximity given its smallest number of provinces. Population density increased over time, as expected. Notice that even though the historical prefectures are mapped onto the fixed boundaries of P.R. China 2010, the Song dynasty had 25 fewer prefectures as its whole territory does not cover the entire China Proper regions (see Figure 2 for details. The top left panel shows that the Song dynasty does not cover some of the western territories in the China Proper regions).

3.6 Data Validation

Given that the clan land data collected by Li and Jiang (1998) is not a census, I validate it with the *Comprehensive Catalogue of Chinese Genealogies*, which can be considered a census for clan genealogy. We expect the two datasets to have a positive correlation, as clan land establishments are more likely to occur in prefectures where more clans have achievements recorded in genealogies.

I begin by examining the correlation in the raw data. The correlation coefficients between the natural logarithm of the number of clans with compiled genealogies and the two measures of powerful clan prefectures (dummy and coverage) are 0.3016 and 0.3375, respectively. These values are reasonably high, considering that the underlying sources of variation are completely different and that few clans compiled genealogies during the Song dynasty.[28] I then regress the clan land measures on the number of genealogies compiled in each dynasty.[29] Table A6 in the appendix confirms the strong positive correlation.In a robustness check, I also use the clan genealogy data as an alternative measure for local institutions, and the results still hold.

4 Empirical Framework

The empirical analysis assesses the relationship between central administration, measured by proximity to the provincial capital, and the rise of local institutions, namely powerful clans, by exploiting plausibly exogenous changes in proximity resulting from the re-division of provincial boundaries and the relocation of provincial capitals over the dynasties. In this section, I start by presenting a stylized example using the raw data, followed by introducing the empirical specification using the prefecture-level panel data.

4.1 A Stylized Example

Figure 3 depicts a stylized example in the raw data in today's Hebei and Shandong Provinces. The provincial boundaries are black in both dynasties, and historical clan prefectures are shaded in color (blue in Song and green in Ming). The dots (triangle in Song and pentagon in Ming) are the corresponding provincial capitals.

[28] In Figure A5, I plot the clan genealogy data and the clan land data together, where the shaded areas present *historical prefectures with powerful clans* in each dynasty and each dot represents a clan with a compiled genealogy. We can see that the correlation between the two data sets is very high.

[29] To account for prefectures with no clans having compiled genealogies, I add one to the number of clans with compiled genealogies before taking the natural logarithm.

The left panel of the Figure 3 shows the case in the Song dynasty. The prefecture highlighted with dark blue boundary is *Daming Fu*, It belongs to the province *Heibeidong Lu* in Song dynasty. It also happens to be the provincial capital for its province *Hebeidong Lu*. In the Song dynasty, there is clan land establishment in this prefecture and therefore considered as a historical prefecture with powerful clans based on my data.

In the Ming dynasty (the right panel of the Figure 3), this prefecture (still highlighted in dark blue boundary) was divided and administrated in two provinces (*North Zhili* and *Shandong* Provinces), but it is far away from either province's capital. We observe that no additional powerful clan (clan land) establishments are recorded in the data. In comparison, prefectures towards its east were relatively far from their provincial capitals in the Song dynasty, and hence no clan land establishment in song dynasty. However, they became much closer to its provincial capital, and we also observe powerful clan (clan land) establishments in those prefectures in the Ming dynasty.

4.2 Empirical Specification

To examine the relationship between the central administration and the establishment of local institutions, I construct a prefecture-level panel dataset (as described in Section 3) and employ the following difference-in-difference specification:

$$Clan_{ijt} = \beta_1 Proximity_{ijt} + \alpha_i + \lambda_j^t + \theta X_i \times \gamma_t + \varepsilon_{ijt} \tag{1}$$

The unit of observation is prefecture i in province j, dynasty t. $Proximity_{ijt}$ is the negative log-distance for prefecture i to its provincial capital in province j in dynasty t (i.e., -$ln(distance_{ijt})$).[30] $Clan_{ijt}$ is, as mentioned in Section 3.3, either (i) a dummy variable that indicates whether *historical prefectures with powerful clans* cover at least 50% of a prefecture's territory in the P.R.C.2010 prefecture base layer, or (ii) a continuous variable measures that the proportion of prefecture i's territory (in the P.R.C.2010 base layer) is covered by *historical prefectures with powerful clans* in dynasty t.

Province fixed effects, λ_j^t, account for province-specific administrative effects within each dynasty. Each dynasty redefined provincial boundaries, making each province unique to its dynasty. Therefore, dynasty fixed effects, which can absorb the effects of varying numbers of provinces and different average proximities across dynasties, are also captured by the province fixed effects. α_i are the prefecture fixed effects, which account for any location-specific time-

[30] The distance's metric is 100km

invariant characteristics, such as clan culture, ideology, geography etc.

As my analysis covers a long time span (around 1000 A.D. to 1911 A.D.), I additionally include interaction terms of prefecture's geographic and agricultural characteristics (X_i) and dynasty fixed effects $X_i \times \gamma_t$ as controls to allow the impact of these prefecture characteristics X_i to vary across dynasties. X_i includes the average slope, elevation, longitude, latitude, and dummies indicating whether the prefecture contains a major river, whether a prefecture is a coastal city, and agriculture variables including crop suitability of wheat, rice, fox millet, maize, and sweet potato. The first three are the major old-world crops, while the latter two are the new-world crops introduced to China during the late Ming dynasty to the Qing dynasty. These agricultural variables can also account for the effect of different agriculture practices on family ties and preference for collective actions (Ang and Fredriksson, 2017).

The coefficient of interest here is β_1. A positive β_1 suggests strong state administrative capacity will crowd in local institutions and result in local institution establishment; while a negative β_1 indicates state administration will crowd out local institutions. An important assumption is that the changes in proximity to provincial capitals induced by boundaries redrawn and provincial capitals relocated are exogenous to powerful clan (i.e., clan land) establishments. This is based on the idea that the provincial boundaries were "administrative accidents" and did not coincide with human or economic activities. I will validate this assumption empirically in several ways in Section 5.2, by showing that proximity is neither correlated with population density nor the location of powerful clans in the previous dynasty.

The standard errors are clustered at the prefecture level for the baseline analysis. Alternatively, I also use standard errors that allow for spatial dependence within various radii following Conley (1999). A spatial autoregressive model is also used to address potential concerns for spatial autocorrelation.

5 Results

5.1 Main Results

Table 1 reports the estimates of Equation (1). The dependent variables of columns (1) and (2) use a dummy measure (i.e., it takes the value of 1 if at least 50% of a prefecture in the base layer is covered by *historical prefectures with powerful clan*), while columns (3) and (4) use a continuous measure (i.e., the proportion of a prefecture's area in the base layer that is covered by *historical prefectures with powerful clans*). Columns (1) and (2) include prefecture fixed effects and province (in each dynasty) fixed effects; columns (3) and (4) additionally

control for prefectures' geographic and agricultural characteristics interacting with dynasty fixed effects.

The results suggest that local institutions grow where state administrative capacity is stronger (i.e., closer to the provincial capital). In particular, the point estimate from column (2) suggests if a prefecture's distance to its provincial capital doubles (increase by 100%), this will reduce its probability of having a local institution established by about 9.4%, a 30% change from its mean. Put differently, we can use the stylized example depicted in Figure 3 as an illustration. Part of the prefecture highlighted in blue boundaries is mapped to today's *Handan* prefecture. Moving away from the provincial capital in the Ming dynasty reduces the probability of having local institutions (powerful clan) established by 10%. As the stylized example illustrates, no local institution was established in the Ming dynasty.

This result echoes the findings in Dell, Lane, and Querubin (2018), which examines the long-term effects in a similar setting in Asia. By leveraging a cross-sectional variation in historical strength in state governance, they find that villagers who experienced stronger state governance in the past exhibit more civic engagement and better organize public goods and redistribution through civil society. Moreover, Dell, Lane, and Querubin (2018) hypothesize that this occurs because historical strong state governance crowds in local cooperation and local collective actions, and these norms persist even after the differential formal state governance disappears. My result complements their findings by providing direct evidence showing that a strong historical state can indeed crowd in local institutions, which was the heart of local cooperation and collective action using a unique historical panel dataset.

5.2 Threats to Identification

The key to identification relies on the exogeneity of proximity. Specifically, changes in the distance to the provincial capital should result from "administrative accidents" rather than human activities. This assumption might be violated if boundaries were drawn based on preexisting economic development or local institutions (such as clans). Additionally, another identification threat is sample selection. In this subsection, I will present empirical evidence to address these concerns.

Economic Development and Population Size

Could these results capture the effect of economic development or population size on local institutions instead of central administration? It might be the case that clans simply grew in more economically developed regions, and provincial capitals were also relocated to those

regions. That is, economic development or population density might be omitted variables. Alternatively, people might find it more efficient to cooperate in places with a denser population.

In either case, the population density data, which can also be used as a proxy for economic development, can help address the concerns. I first regress the earliest available population density data in each dynasty on the proximity to see whether provincial capitals are strategically relocated to economically developed and/or populated places, conditional on prefecture fixed effects. The earliest available population density is the best proxy for the conditions when the provincial boundaries were drawn. Columns (1) and (2) in Table 2 show that this is not the case.[31] Regardless, I also additionally control for the earliest available population in each dynasty when estimating Equation (1). Results are still consistent with previous findings (columns (3)–(6) in Table 2).[32]

Reverse Causality

Would it be the case that the new provincial capitals were chosen, or the provincial boundaries were redrawn so that provincial capitals were closer to places where clans were powerful to control them better? If so, the results suffer from reverse causality. This is not likely as many scholars have argued that the administrative boundaries did not coincide with human activities (Skinner, 1977; Zhou, 1998, 2013); while provincial capitals were mainly determined by geography for information and resources transmission and military defense.

Nevertheless, I conduct a forward lag test in which I assign Ming dynasty proximity to Song's clans and Qing proximity to Ming's clans to see whether the proximity is correlated with the previous dynasty's powerful clan. This test can also be viewed as a balanced test to see whether pre-existing powerful clans are balanced across different proximity in the new regime. Table 3 presents the results, which reassure us that the prefecture's proximity changes are likely to be exogenous to the local clan power.

Sample Selection

There are two major concerns associated with sample selection. One is associated with Li and Jiang (1998)'s data collection process. They might face difficulties collecting data for a

[31] The earliest available population data is the year of 980, 1394, and 1776 for each respect dynasties. These years correspond to the 21st year, the 26th year, and 134th of each dynasty. This result still holds when excluding the Qing dynasty (see Table A5 in the appendix).

[32] Note that even the earliest population density for each dynasty might be an outcome of the proximity changes (e.g., selective migration or population booming). Thus, it might be a bad control, and the results from columns (3)–(6) in Table 2 should be interpreted with caution.

particular prefecture. In this case, this effect will be captured by prefecture fixed effects.

The other is about historical data recording bias or survival bias. In this case, prefecture fixed effects are also helpful. For example, suppose a particular prefecture might have had difficulty preserving historical archives for various reasons (such as the archive did not survive during the early communist era). This effect would be captured in prefecture fixed effects.

This concern can also be prefecture-dynasty varying so as not to be captured by prefecture fixed effects. For example, each dynasty's records might be easier to preserve when a prefecture was closer to the provincial capital. Or it might be the case when there were more incentives to take the record when a clan is located in a prefecture close to the provincial capital. However, if this is the main driving force for the results shown on Table 1, we should expect the results are more salient among provinces that were close to imperial capitals.

To this end, I amend Equation (1) by adding an interaction term between proximity and a dummy variable indicating if a prefecture belongs to the province whose distance from the imperial capital is above the median level in the dynasty. We would expect this coefficient to be positive and significant if the results are indeed driven by the aforementioned data recording bias or survival bias. However, Table 4 does not find such an effect.

5.3 Mechanisms

5.3.1 State Co-option

What could explain the positive relationship between central state administrative capacity and the development of local institutions? This sub-section will explore how state co-option may serve as a key driving force and its implications.

In ancient times, the central state faced numerous challenges in ruling a geographically vast and culturally diverse empire, such as Imperial China. It was almost impossible for the central state to gather information from all local regions and address issues in a timely manner (Morris and Scheidel, 2009). Furthermore, limited fiscal capacity constrained the state's ability to appoint a large number of officials to handle all administrative tasks (Sng, 2014). As a result, the state often delegated many duties to local elites, such as tax collection, peacekeeping, and local public goods provision. These local elites had a better understanding of local conditions and were better connected with the local populace, allowing them to adapt more effectively to changing circumstances (Levi, 1989). Consequently, co-opted local elites were granted significant power and many perks. They then invested in local institutions to consolidate their power and social status. Meanwhile, the state did not prevent them from doing so, as the development of local institutions also enabled them to perform their duties

more effectively. In other words, the state and local elites were co-dependent on each other.

The question then arises: where would the state co-opt more and allow local institutions to develop? One might think that the state would co-opt more where its own capabilities are weak. However, this approach carries the risk that local elites might eventually withdraw from their roles as agents and oppose the state. Therefore, the state might choose to co-opt only where its own capabilities are strong so that they can confidently monitor these local elites while enjoying the benefits of co-option, even if these areas do not offer the greatest benefits. (Appendix IV offers a simple model illustrating this trade-off more formally).

If the aforementioned co-optation is a key driving mechanism, we should expect stronger co-option and, therefore, more local institution development in areas where state monitoring costs are low. For example, in places with more garrison stations, the effect should be even more pronounced since the presence of garrison stations reduces concerns that local elites might pose a threat to the state. Moreover, we expect garrison stations themselves to have no impact on local institution development, as they are responsible for dealing with external military threats and do not co-opt local elites.

In what follows, I examine whether (i) local elites were co-opted. (ii) as a result of state co-option, local institutions were more likely to develop in regions where the state's monitoring costs were low (more garrison stations).

Illustrating that local elites were co-opted and performed more administrative duties when they were closer to the provincial capitals is, however, a challenging task using observational outcome data. For example, if we observe more efficient tax collection closer to provincial capitals, it could be due to either higher state administrative capabilities or effective co-option of local elites. To disentangle the two, I examine the provision of schools, a key public good that we can distinguish as being provided by either the state or local elites.

In Columns (1) and (2) of Table 5, we focus on academy schools per (hundred thousand) population. Academy schools (*shu yuan*) were purely provided by local elites. The results show that more academies were provided closer to the provincial capitals where state administrative capacities were strong. What about regions further away? Does the state government provide more direct public goods in those regions, even if it had weaker capacity there? In Columns (3)-(6), we focus on county schools (*xian xue*), which were provided purely by the state government. Specifically, columns (3) and (4) focus on newly established schools, while columns (5) and (6) include all operating county schools, including both newly established and renovated schools from previous dynasties. In either case, there are no differences in the provision of county schools, suggesting that the state relies on co-option where its admin-

istrative capacity is strong.[33] However, regions where state administration was weak were largely neglected, suffering from inadequate provision of goods and services from the central state and lacking local institutions to organize and help overcome collective action problems.

Next, as discussed earlier, we test whether the effects of state administrative capacity (measured by proximity to provincial capitals) on local institution development (measured by clan land development) are more pronounced in areas with more garrison stations. The results, shown in Table 6, include an interaction term–the number of garrison stations in each prefecture–with the proximity measures. Consistent with the co-option hypothesis, the effect is indeed more pronounced in areas with more garrison stations, suggesting that where monitoring costs are low, there will be more co-option and, consequently, more local institution development. Moreover, the garrison stations themselves have no explanatory power on local institution development, as expected.

5.3.2 Alternative Mechanisms

Selective Migration

It could be the case that more people migrated to places near the provincial capitals, and those migrants invested more in clans to make their clans more powerful when facing the external challenges in the novel environment. To assess this possibility, I exploit the migration information in the genealogical data to determine whether the founding ancestors of clans that eventually had genealogies indeed moved closer to provincial capitals. I use the number of clans' founding ancestors migrating to prefecture i in province j during dynasty t (in natural logarithm) as the dependent variable, and regress it to proximity.[34] Results are shown in Panel A of Table 7. In columns (3) and (4), I also include population density in the regression to account for the possibility that more clan genealogies were compiled in populated prefectures. Overall, the results do not support the selective migration story across all specifications.

Human Capital

More human capital might be developed closer to provincial capitals. Could it be that more educated elites better understand the benefits of cooperative institutions, leading to more

[33] County-school data was not available for the Qing dynasty, which results in a fewer number of observations. Note that the major variation in proximity comes from the Song dynasty to the Ming dynasty, so missing county-school data for the Qing dynasty does not lose much variation other than through sample size.

[34] To account for some prefectures with zero founding ancestors migrated to in a dynasty, I add 1 to the number of clans migrated before taking the natural logarithm.

local institution development? I therefore also control for the number of people who passed various levels of civil service exams (number of *jinshi* and *juren*). The results are shown in Panel B of Table 7. The coefficients for proximity are similar to those in Table 1 after controlling for human capital. This suggests that human capital is unlikely to be the main driving force, although it does have explanatory power on local institution development.

Clan Competition

Another hypothesis is that clans might leverage the state's power to compete with and suppress rival clans, thereby becoming more powerful. Indeed, there were many instances of armed inter-clan conflicts toward the end of the Qing dynasty (Du, 2008). Consequently, in prefectures with stronger state administrative capacity, some clans could use state power to suppress their rivals and consolidate power. If this were the case, we would expect to see fewer organized clans in prefectures close to the provincial capitals over the course of a dynasty.

To examine this hypothesis, I divide each dynasty into four equal periods to see if there were fewer organized clans closer to the provincial capitals over time. The number of organized clans is measured by the number of clans' compiled genealogies, as provided by the *Comprehensive Catalogue of Chinese Genealogies*. Figure 4 shows that prefectures closer to provincial capitals had more clan activities in later periods of a dynasty rather than at the beginning. This finding suggests that the aforementioned clan competition mechanism is unlikely to explain the rise of local institutions.

Of course, clan competition could also occur differently: warfare between clans might be more likely where state capacity is weaker since the state could not intervene to stop the conflicts. Since such conflicts would sap the vitality of all active clans, no powerful clans would emerge where state administrative capacity was weak (far from provincial capitals).

In this case, we would expect the main results to be more pronounced in the Qing dynasty, as inter-clan conflicts were most prevalent during that period. To check this, I add an interaction term between proximity and an indicator variable for the Qing dynasty. Panel C of Table 7 shows that this is not the case.

5.4 Robustness Checks

Spatial Autocorrelation

Figure 2 shows that clan prefectures are largely clustered in the southeast. This could affect the standard error of the point estimates. Moreover, the spatial correlation might directly

affect the process of forming a powerful clan (i.e., it is a spatial stochastic process), which means that the determinants of powerful clan formation are partly due to direct contagion. In this case, results in Table 1 also pick up some spatial noise, and as a result, the point estimates might also be biased.

I address the first concern by allowing spatial correlation in the error terms by using standard errors that allow for spatial dependence within various radius following Conley (1999). Results are shown on Panel A of the Table 8. By varying different spatial correlation cutoffs (100 km and 1000 km), I show that the standard errors of the main coefficients do not vary much.[35]

Regarding the second concern, I employ a spatial autoregressive model, which modifies the original specification by adding a spatial lag for the dependent variable and a spatially lagged error term. Results are shown on Panel B of the Table 8, and they remain consistent.[36]

Alternative Clan Data

If the positive relationship between the state administrative capacity and the development of local institutions is indeed due to state co-option, we should observe this relationship in both extensive and intensive margins since one clan, no matter how strong it is, would have limited capacity to carry out state delegated tasks. However, the measurement error in the clan land data counts from Li and Jiang (1998) prevents me from testing the hypothesis in the intensive margin.

In this case, I employ an alternative dataset—the *Comprehensive Catalogue of Chinese Genealogies*, which can be considered a census for Chinese clan genealogy–to see if the main results of this paper still hold. Compiling genealogy can also be regarded as a clan activity, which can be viewed as having a certain level of clan power (Dincecco and Wang, 2021).

I use the number of clans' complied genealogies (in its natural logarithm) as a dependent variable to re-estimate Equation (1), and we still see positive significant coefficients (columns (1) and (2) on Table 9). In columns (3) and (4), I also include population density to control for the possibility that more clan genealogies were compiled in populated prefectures and results still hold. This finding confirms that a strong state does crowd in the development of local institutions, also at an intensive margin.

However, one caveat of the *Comprehensive Catalogue of Chinese Genealogies* dataset is

[35]The standard errors change minimally using other radii.

[36]Table 8 has fewer observations from Table 1 because a strongly balanced panel is required to do a spatial autoregressive model. The Song dynasty has a relatively smaller territory and, therefore, a few prefectures only exist in the Ming and Qing dynasty. These prefectures will not be in the sample when conducting a spatial autoregressive model.

that there were scant few clans that had a genealogy in the Song dynasty, which provides minimal variation in the data.[37] Meanwhile, the transition from the Song dynasty to the Ming dynasty provides the major variation of the proximity changes as this is when provincial boundaries and provincial capitals had significant changes. Thus, this result should be interpreted with caution.

Proximity to Imperial Capitals

In my main analysis, I use proximity to provincial capitals to measure the state's administrative capacity instead of proximity to imperial capitals. While Imperial capitals can better represent state administrative capacity, all the imperial capitals were located in the east side of China, which causes less variation in the proximity to imperial capitals, especially for those in the West. Furthermore, this geography also suggests that the proximity to imperial capitals is more likely to suffer from geographic influence despite comprehensive sets of control variables and thus be endogenous to the development of local institutions.

Nevertheless, we should expect to see similar and perhaps even stronger effects when using proximity to imperial capitals as a proxy. Indeed, in Table 10, when I replace the main explanatory variable with proximity to the imperial capital, although the standard deviation of the proximity measures is relatively similar (0.80 for proximity to provincial capitals and 0.78 for proximity to imperial capitals), the size of the coefficients is much larger.[38] Despite the proximity to imperial capitals not being an ideal measure, this gives us more confidence that the results in Table 1 can be interpreted as the effect of state administration.

Alternative Threshold for Clan Prefecture

In the main analysis, I define a P.R. China 2010 prefecture as a clan prefecture (dummy) if more than 50% of its territory is covered by *historical prefectures with powerful clans* in a given dynasty. To show that the results are consistent with different thresholds, I use various cutoff points to define the dependent variable. Results are shown on Figure 5. The top panel replicates column (1) in Table 1 while the bottom panel replicates column (2). We continue to see a robust positive relationship between proximity and the local development of institutions.

[37] Figure A5 in the appendix shows the distributions of clan genealogy compiled for each dynasty. Each circled dot in purple represents one clan's compiled genealogy in the corresponding dynasty.

[38] The Ming dynasty effectively had two imperial capitals, one in today's Nanjing and the other in today's Beijing. I use the smaller distance to either capital when constructing the proximity.

6 Conclusion

This paper explores the role of centralized state administration in the development of local institutions in Imperial China from approximately 1000 A.D. to 1900 A.D. Imperial China offers two significant advantages for studying this relationship: the presence of powerful clans, which served as the most important local institutions across the core regions of China and various dynasties, allowing for systematic measurement of local institutions over time and space. Additionally, changes in proximity to administrative centers resulting from regime shifts during this period provide a plausibly exogenous variation in state administrative capacity across local prefectures.

Using a panel dataset of 267 prefectures spanning three dynasties, I find that local institutions thrive when state administrative capacity is strong. One explanation for this finding is that states with stronger administrative capacity were better able to co-opt local elites and delegate administrative duties to them, as they could more effectively monitor these elites. Co-opted local elites, empowered by the state, invested in local institutions to consolidate their power, prestige, and privileges. However, this dynamic also resulted in insufficient social capital and public goods and services in regions with weaker state administrative capacity, potentially leading to long-term economic and social consequences.

While this positive relationship may not hold in all contexts, this research, to the best of my knowledge, is the first to provide empirical evidence demonstrating that such a complementary relationship does indeed exist. Future research could explore this relationship in different institutional settings, such as in Europe or Africa, to further understand the mechanisms behind the interaction between state administration and the development of local institutions.

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Figures and Tables

Figure 1: Timeline

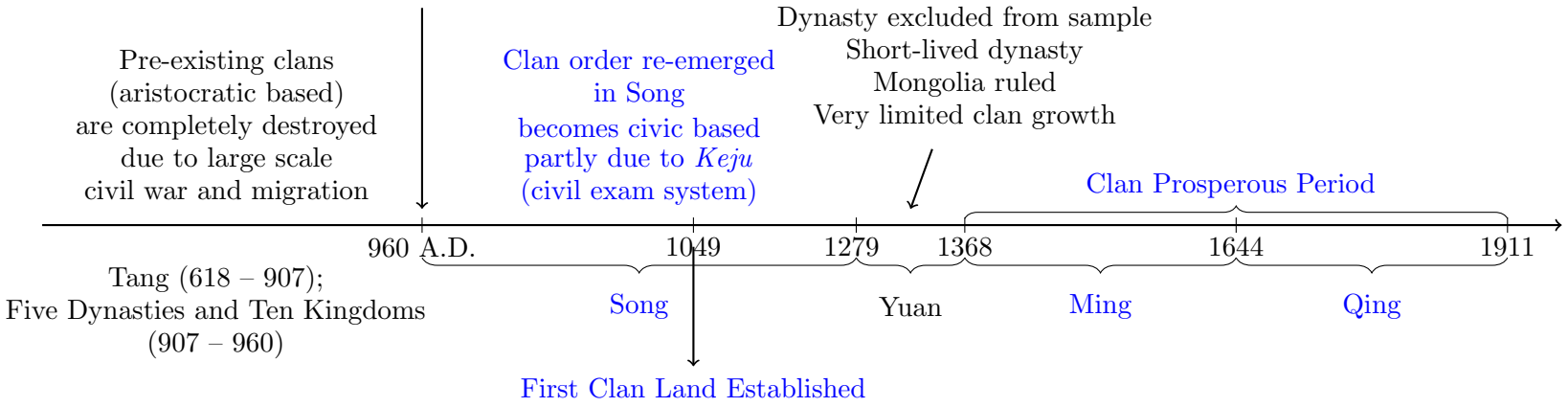


Figure 2: Spatial Distribution of Strong Clan Prefectures

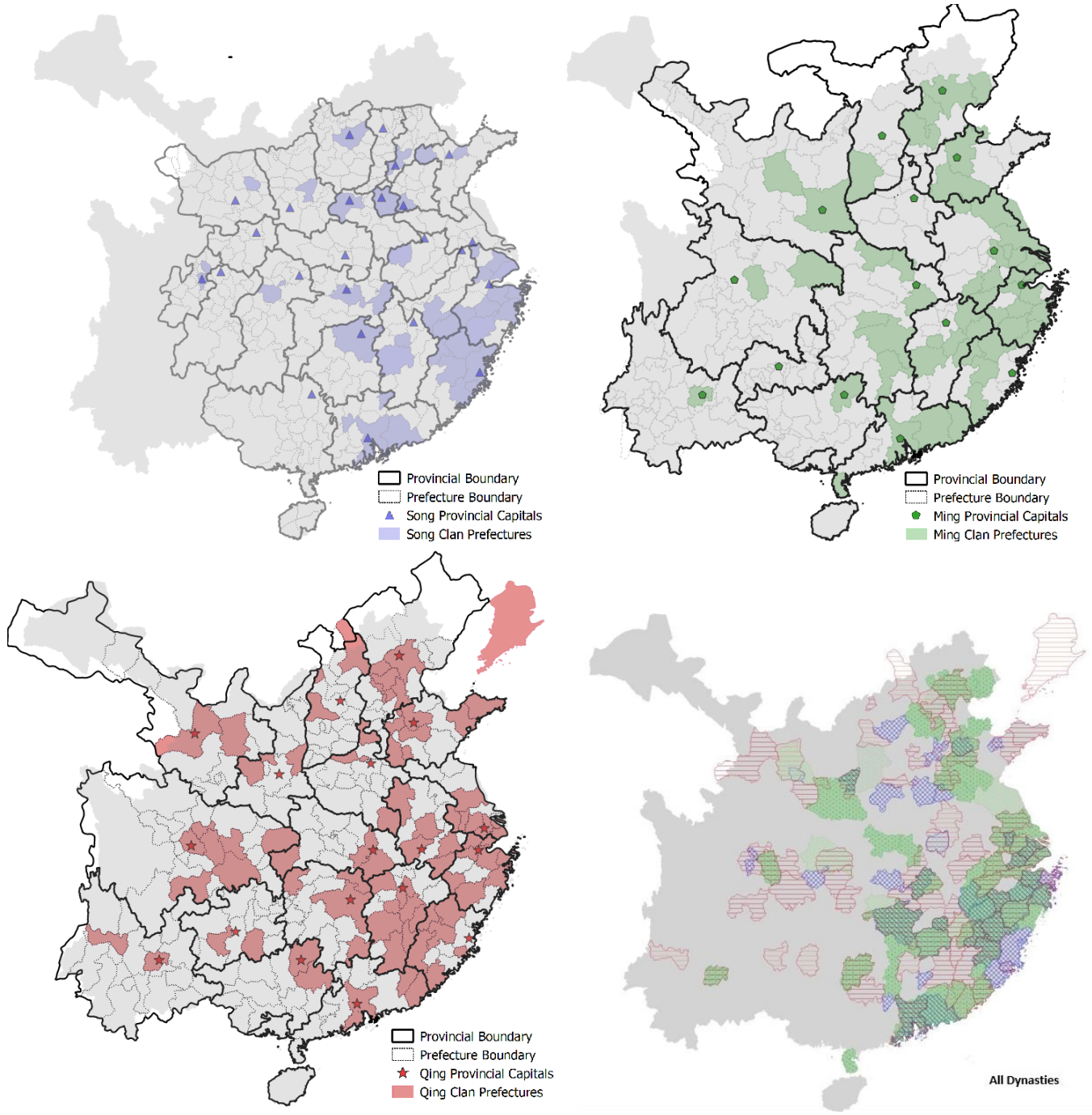
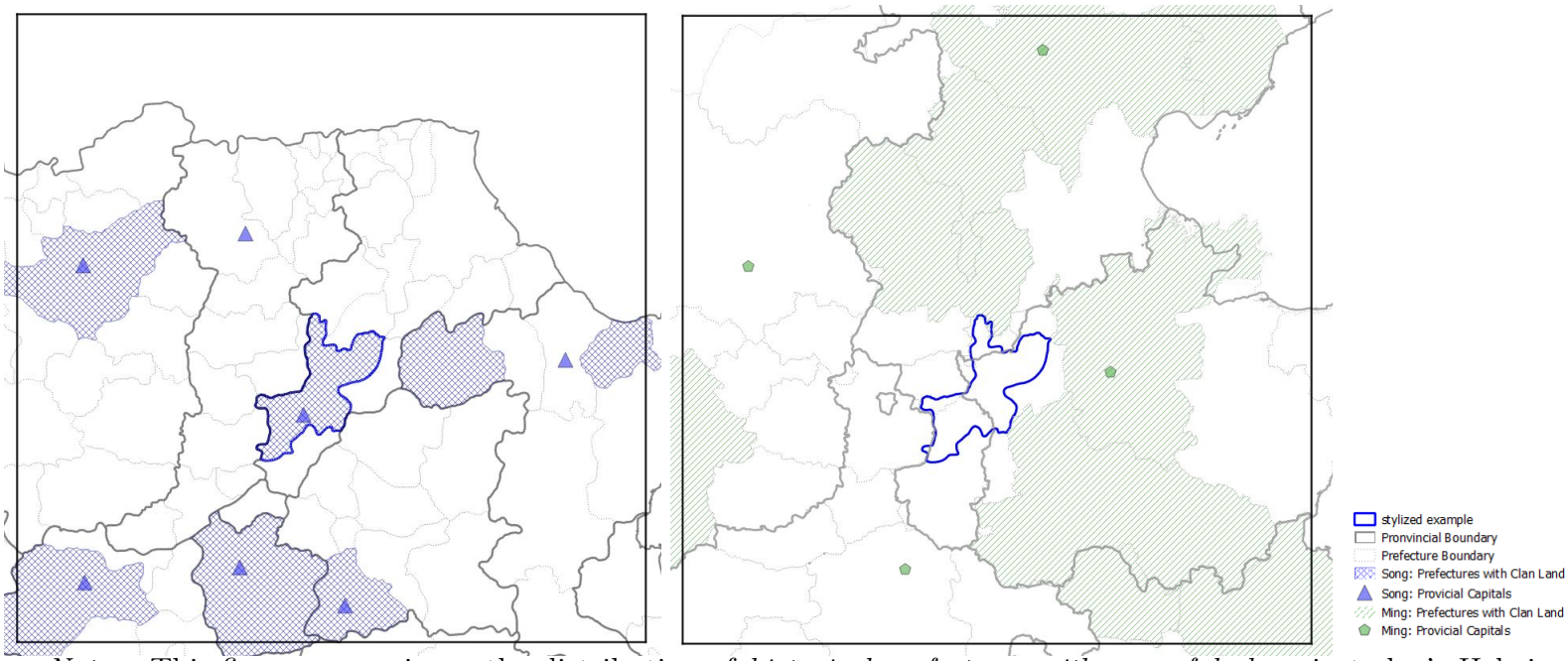
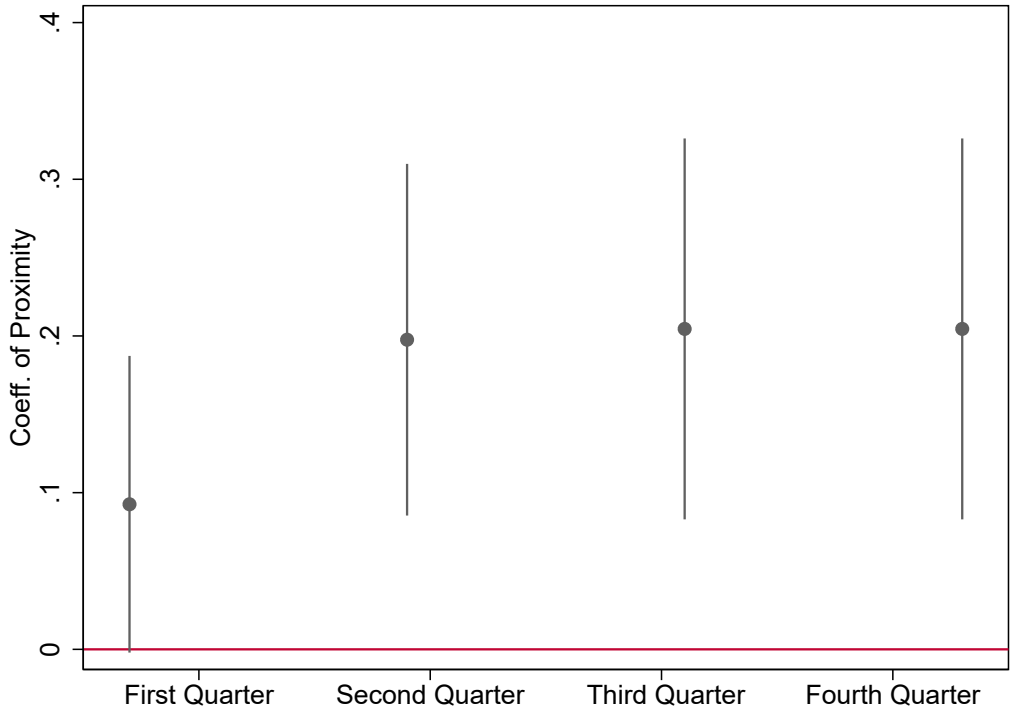


Figure 3: Stylized Example



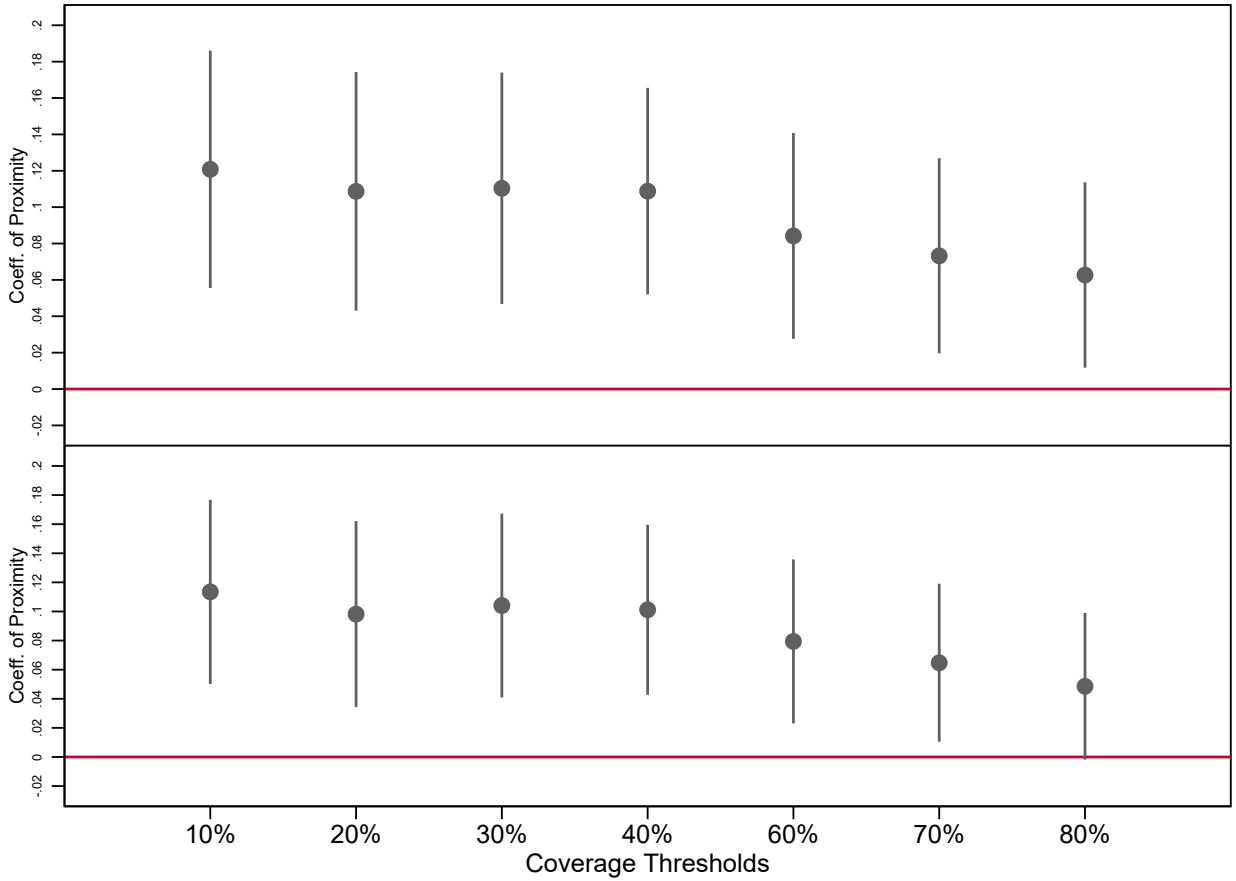
Notes: This figure zooms in on the distribution of *historical prefectures with powerful clans* in today's Hebei and Shandong Provinces. The left panel shows the distribution during the Song dynasty, and the right panel shows that during the Ming dynasty. Provincial boundaries are marked in black in both dynasties, and clan prefectures are shaded in color (blue for Song and green for Ming). The dots (triangles for Song and pentagons for Ming) represent the corresponding provincial capitals.

Figure 4: Number of Clans Compiled Genealogy by Quarter



Notes: Each dynasty is divided into four equal periods (quarters). The figure shows point estimates (with 90% confidence intervals) for the effect of proximity on the number of clans that compiled genealogies in each quarter.

Figure 5: Alternative Threshold for Clan Prefecture



Notes: Point estimates (with 90% confidence intervals) are shown for each threshold used in defining the dummy measure of a clan prefecture. The top panel includes prefecture fixed effects and province-by-dynasty fixed effects. The bottom panel additionally controls for interaction terms between prefecture characteristics and dynasty fixed effects. Prefecture characteristics include average slope, elevation, longitude, latitude, dummy variables indicating whether the prefecture contains a major river or is a coastal city, and agriculture suitability indexes for wheat, rice, foxtail millet, maize, and sweet potato.

Table 1: Proximity and Clan Land Establishment

Dependent Variable:	Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
	(1)	(2)	(3)	(4)
Proximity	0.099***	0.094***	0.089***	0.081***
	(0.034)	(0.035)	(0.029)	(0.029)
Observations	776	776	776	776
R-squared	0.278	0.320	0.318	0.366
Number of Prefectures	267	267	267	267
Controls	N	Y	N	Y
Std. Dev. Proximity	0.800	0.800	0.800	0.800
Mean. Proximity	-0.526	-0.526	-0.526	-0.526
Dep. Var Mean	0.311	0.311	0.315	0.315

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%. The dependent variable in columns (1) and (2) uses a dummy measure that takes a value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory, while columns (3) and (4) use a continuous measure that equals the proportion of the prefecture's territory covered by *historical prefectures with powerful clans*. All columns include prefecture fixed effects and province fixed effects. Columns (2) and (4) also control for interaction terms between prefecture characteristics and dynasty fixed effects. Prefecture characteristics include average slope, elevation, longitude, latitude, dummy variables indicating whether the prefecture contains a major river or is a coastal city, and agricultural suitability indexes for wheat, rice, foxtail millet, maize, and sweet potato.

Table 2: Economic Development

Dependent Variable:	Dynasty Earliest Pop. Density		Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
	(1)	(2)	(3)	(4)	(5)	(6)
Proximity	0.063	0.026	0.094***	0.092***	0.085***	0.079***
	(0.053)	(0.049)	(0.035)	(0.035)	(0.029)	(0.029)
Dynasty Earliest Pop. Density			0.085*	0.092*	0.068*	0.078*
			(0.046)	(0.052)	(0.037)	(0.043)
Observations	776	776	776	776	776	776
R-squared	0.831	0.884	0.283	0.324	0.322	0.370
Number of Prefecture	267	267	267	267	267	267
Controls	N	Y	N	Y	N	Y
Dep. Var Mean	0.537	0.537	0.311	0.311	0.315	0.315

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Dynasty's earliest population density refers to the earliest population density data available for each dynasty. The dependent variable for columns (3) and (4) use a dummy measure which takes a value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory; while columns (5) and (6) use a continuous measure which equals to the proportion of the prefecture's territory is covered by *historical prefectures with powerful clans*. All columns include prefecture fixed effects and province fixed effects. Even-numbered columns additionally control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table 3: Forward Test (Reverse Causality)

Dependent Variable:	Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
	(1)	(2)	(3)	(4)
Next Dynasty's Proximity	-0.079	-0.009	-0.065	-0.009
	(0.063)	(0.064)	(0.054)	(0.055)
Observations	534	534	534	534
R-squared	0.386	0.426	0.424	0.475
Number of Prefectures	267	267	267	267
Controls	N	Y	N	Y
Dep. Var Mean	0.270	0.270	0.273	0.273

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The next dynasty's proximity is the main explanatory variable (i.e., the Ming dynasty's proximity to the clan variables in the Song dynasty and the Qing dynasty's proximity to the clan variables in the Ming dynasty). The dependent variable for columns (1) and (2) use a dummy measure which takes a value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory; while columns (3) and (4) use a continuous measure which equals to the proportion of the prefecture's territory is covered by *historical prefectures with powerful clans*. All columns include prefecture fixed effects and province fixed effects. Even-numbered columns additionally control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table 4: Data Selection Bias

Dependent Variable:	Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
	(1)	(2)	(3)	(4)
Proximity	0.115***	0.110***	0.096***	0.087***
	(0.040)	(0.039)	(0.034)	(0.033)
Proximity $\times \mathbb{1}_{>\text{Median Distance to Imperial Capital}}$	-0.068	-0.073	-0.027	-0.029
	(0.055)	(0.056)	(0.046)	(0.047)
Observations	776	776	776	776
R-squared	0.280	0.322	0.318	0.366
Number of Prefectures	267	267	267	267
Controls	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The dependent variable for columns (1) and (2) use a dummy measure which takes a value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory; while columns (3) and (4) use a continuous measure which equals to the proportion of the prefecture's territory is covered by *historical prefectures with powerful clans*. A dummy variable indicating whether a prefecture belongs to a province whose distance from the imperial capital is above the median interacts with proximity. All columns include prefecture fixed effects and province-by-dynasty fixed effects. Columns (2) and (4) also control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table 5: Public Goods Provision

Dependent Variable:	ln(Number of Schools per Capita)					
	Official Built Private Academies		Newly Established County Schools		Total County Schools	
	(1)	(2)	(3)	(4)	(5)	(6)
Proximity	0.247*	0.236†	-0.003	-0.003	-0.003	-0.004
	(0.146)	(0.146)	(0.002)	(0.003)	(0.002)	(0.003)
Observations	776	776	504	504	504	504
R-squared	0.521	0.567	0.235	0.263	0.244	0.274
Number of Prefectures	267	267	267	267	267	267
Controls	N	Y	N	Y	N	Y
Dep. Var Mean	4.728	4.728	0.0202	0.0202	0.0211	0.0211

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The dependent variable in columns (1) and (2) is the number of academy schools per capita (in natural log form), while the dependent variable in columns (3) to (6) is the number of county schools per capita (in natural log form). Columns (3)-(6) use sample for the Song and Ming dynasties only. All columns include prefecture fixed effects and province fixed effects. Even-numbered columns additionally control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table 6: State Co-option: Garrison Stations

Dependent Variable:	Clan (Dummy)		Clan (Percentage)	
	(1)	(2)	(3)	(4)
Proximity	0.086**	0.076*	0.059*	0.046†
	(0.041)	(0.040)	(0.031)	(0.031)
Proximity× Garrison	0.100***	0.103***	0.088***	0.090***
	(0.037)	(0.038)	(0.024)	(0.024)
Garrison	-0.007	-0.024	-0.012	-0.007
	(0.057)	(0.062)	(0.038)	(0.039)
Observations	776	776	776	776
R-squared	0.312	0.347	0.328	0.376
Number of prefecture	267	267	267	267
Controls	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The dependent variable for columns (1) and (2) use a dummy measure which takes a value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory; while columns (3) and (4) use a continuous measure which equals to the proportion of the prefecture's territory is covered by *historical prefectures with powerful clans*. Garrison refers to the number of garrison stations for each prefecture in each dynasty. All columns include prefecture fixed effects and province fixed effects. Even-numbered columns additionally control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table 7: Alternative Mechanisms

	(1)	(2)	(3)	(4)
Panel A: Selective Migration				
Dependent Variable:	ln (# Clans Migrated +1)			
Proximity	-0.054	-0.057	-0.048	-0.055
	(0.053)	(0.052)	(0.053)	(0.052)
R-squared	0.641	0.669	0.642	0.669
Population Density	N	N	Y	Y
Panel B: Human Capital				
Dependent Variable:	Clan (Dummy)		Clan (Percentage)	
Proximity	0.097***	0.093***	0.087***	0.079***
	(0.034)	(0.035)	(0.029)	(0.029)
Number of *Jinshi/Juren*	0.057†	0.067*	0.056*	0.065*
	(0.038)	(0.040)	(0.034)	(0.035)
R-squared	0.310	0.346	0.325	0.375
Panel C: Clan Competition				
Dependent Variable:	Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
Proximity	0.092**	0.096**	0.085***	0.084***
	(0.037)	(0.038)	(0.032)	(0.032)
Proximity $\times \mathbb{1}_{Qing}$	0.021	-0.007	0.012	-0.010
	(0.049)	(0.053)	(0.038)	(0.040)
R-squared	0.279	0.320	0.318	0.366
Controls	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Panel A uses the natural logarithm of the number of founding ancestors who migrated to each dynasty's prefecture among clans that eventually had genealogies as the dependent variable. To account for prefectures that might have no founding ancestors migrating in a dynasty, I add 1 to the number of clans before taking the natural logarithm. Columns (1) and (2) for Panels B and C use a dummy variable, which takes a value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory. Columns (3) and (4) for Panels B and C use a continuous measure, which equals the percentage of the prefecture's territory covered by *historical prefectures with powerful clans*. In Panel C, a dummy variable for the Qing dynasty interacts with proximity, taking a value of 1 for observations from the Qing dynasty and 0 otherwise. All columns include prefecture fixed effects and province-by-dynasty fixed effects. Columns (2) and (4) also control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table 8: Spatial Correlation

Panel A: Conley Standard Error								
Radius:	100 Km				1000 Km			
Dependent Variable:	Clan Prefecture (Dummy)		Clan Coverage (Percentage)		Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Proximity	0.099***	0.094***	0.089***	0.081***	0.099***	0.094***	0.089***	0.081***
	(0.027)	(0.026)	(0.021)	(0.020)	(0.029)	(0.034)	(0.023)	(0.025)
Observations	776	776	776	726	776	776	776	726
Number of prefectures	267	267	267	267	267	267	267	267
Panel B: Spatial Autoregressive Model								
Weighting Matrix:	Inverse Distance				Contiguity			
Dependent Variable:	Clan Prefecture (Dummy)		Clan Coverage (Percentage)		Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Proximity	0.100***	0.097***	0.086***	0.071**	0.104**	0.099**	0.083***	0.077***
	(0.035)	(0.036)	(0.029)	(0.029)	(0.037)	(0.036)	(0.030)	(0.030)
Lag Dep.Var	-0.097	-0.438	0.391	0.239	-0.074	0.105	0.083	0.127
	(0.477)	(0.560)	(0.333)	(0.388)	(0.267)	(0.234)	(0.192)	(0.187)
Lag Error	-0.050	-0.378	0.541	1.033***	0.431†	0.166	0.525***	0.446**
	(0.579)	(0.712)	(0.380)	(0.021)	(0.272)	(0.290)	(0.191)	(0.206)
Observations	726	726	726	726	726	726	726	726
Number of prefectures	242	242	242	242	242	242	242	242
Controls	N	Y	N	Y	N	Y	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The top panel adjusts the standard errors by allowing for spatial dependence within various radius following Conley (1999). The bottom panel uses a spatial autoregressive model by adding a spatial lag for the dependent variable and the error term. All columns include prefecture fixed effects and province fixed effects. Even-numbered columns additionally control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table 9: Alternative Clan Data

Dependent Variable:	ln (# Clans Complied Genealogy +1)			
	(1)	(2)	(3)	(4)
Proximity	0.228***	0.218***	0.212***	0.212***
	(0.074)	(0.077)	(0.073)	(0.077)
Observations	776	776	776	776
R-squared	0.836	0.862	0.838	0.863
Number of Prefectures	267	267	267	267
Controls	N	Y	N	Y
Population Density	N	N	Y	Y
Dep. Var Mean	0.908	0.908	0.908	0.908

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The dependent variable is the number of clans compiled genealogy (in natural logarithm). Considering some prefectures might have zero clans compiled genealogies in a dynasty, I add 1 to the number of clans before taking the natural logarithm. All columns include prefecture fixed effects and province fixed effects. Columns (3) and (4) also include population density as a control. Even-numbered columns additionally control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table 10: Proximity to Imperial Capital

Dependent Variable:	Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
	(1)	(2)	(3)	(4)
Proximity to the Imperial Capital	0.125**	0.189***	0.153***	0.201***
	(0.063)	(0.066)	(0.056)	(0.058)
Observations	776	776	776	776
R-squared	0.272	0.318	0.314	0.368
Number of Prefectures	267	267	267	267
Controls	N	Y	N	Y
Std. Dev. ln Distance	0.780	0.780	0.780	0.780
Mean. ln Distance	-2.007	-2.007	-2.007	-2.007
Dep. Var Mean	0.311	0.311	0.315	0.315

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Proximity to the imperial capital is used as the main explanatory variable. In the case of the Ming dynasty, which effectively had two imperial capitals, closer proximity to either capital is used. Even-numbered columns additionally control for interaction terms between prefecture characteristics and dynasty fixed effects.

[Not for Publication (This page onwards)]

Appendix I

Figure A1: China Proper Regions

Notes: Prefectures for P.R. China 2010 are shown. The shaded areas are China proper regions.

Figure A2: Provincial Capitals

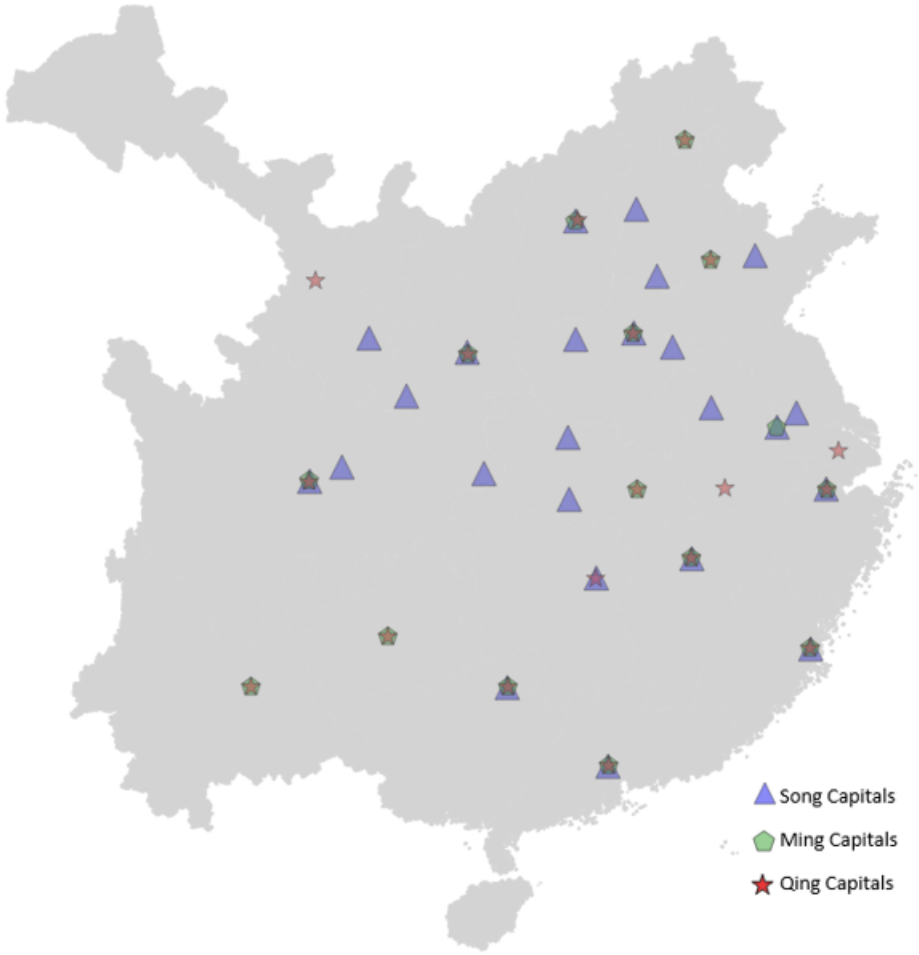
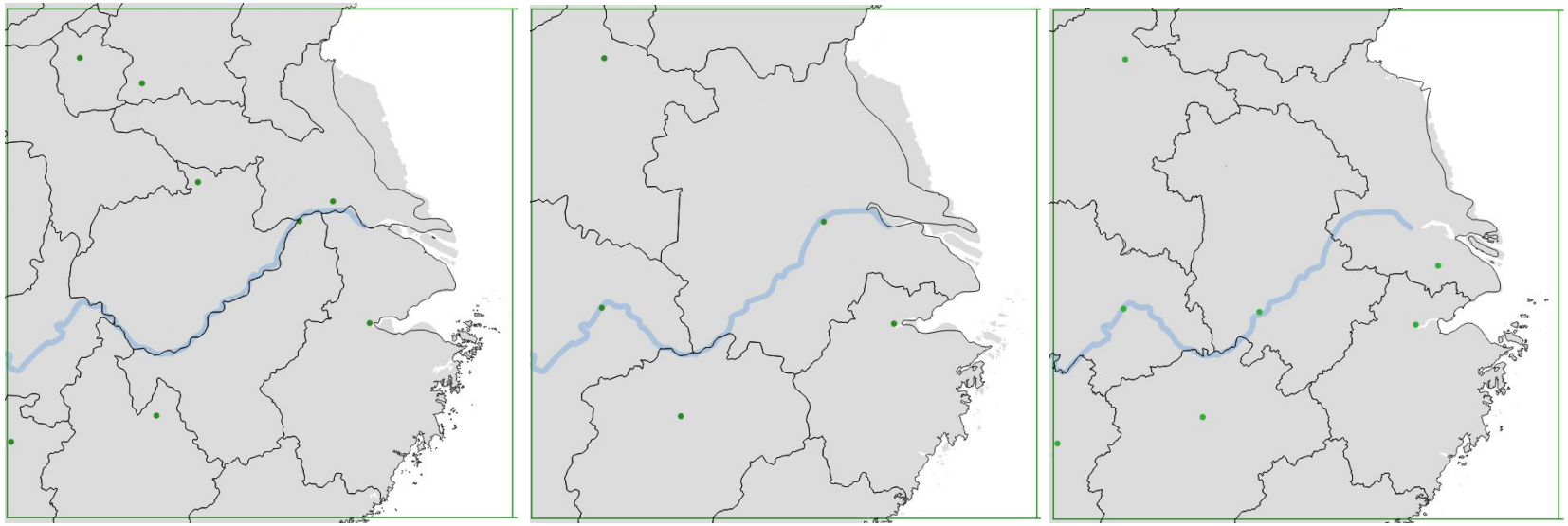


Figure A3: Yangtze Rive Regions



Notes: Gray boundaries are provincial boundaries for each dynasty. The blue line is the Yangtze River.

Figure A4: Raw Data

Emperor period | Location | contributor | area | Notes | Sources

年代	省县	建置人	面积(亩)	备　注	资料来源
嘉靖	宜兴	任卿	2800	置学田 1000 亩，义田 1000 亩，役田 800 亩。	《古今图书集成·学行典》，卷 243，《笃行部》。
明	宜兴县	陈一经(子官御史)		"置义塾义田，子于廷克成其志"。	《古今图书集成·学行典》，卷 249，《笃行部》。
	宜兴县	徐溥	800		张萱：《西园闻见录》。
明	宜兴县	吴驭(詹事府主簿)	200	"割上腴田二顷为祠田以赡宗族"。	《古今图书集成·学行典》，卷 249，《笃行部》。
	宜兴县	徐显卿	300	役田。	张萱：《西园闻见录》。
明末	上海?	唐锦端		"置义田若干亩"。	《古今图书集成·学行典》，卷 245，《笃行部》。
明后期	山阳县	丘氏		建祠堂以祀先祖，置祭若干亩。至清初"山阳丘氏之子弟多孝谨，守家法"。	《八旗文经》，卷 43。
万历	吴江县	沈氏	430		乾隆《吴江县志》，卷 37。
明	常州	伍某		义田，禁典卖。	李绂祯：《大拙山房集》，卷 56，《伍氏义田记》。
	常州府	吴情	1800	其中赡族十之三，助役占十之七(为乡人助役)	申时行：《常州府志》。
明	长洲县	徐某		义田，禁典卖。	张萱：《西园闻见录》，卷 5，《教睦·徐显卿·义田家训》。

identify at county level

Only identify at prefecture level

Translation

Emperor Period	Location	Contributor	Area	Notes	Sources
Jiaqing Emperor	Yixing	Ren Qing	2800		
Ming	Yixing County	Chen Yijing	.		
	Yixing County	Xu bo	800		
Ming	Yixing County	Wu yu	200		
	Yixing County	Xu Shiqing	300		
End of Ming	Shanghai	Tang Yaojing	.		
Later Ming	Shanyang County	The Qiu	.		
Wanli Emperor	Wujiang County	The Shen	430		
Ming	Changzhou	The Wu	.		
	Changzhou Prefecture	WU Qing	1800		
Ming	Changzhou County	The Xu	.		

Figure A5: Clans Genealogy

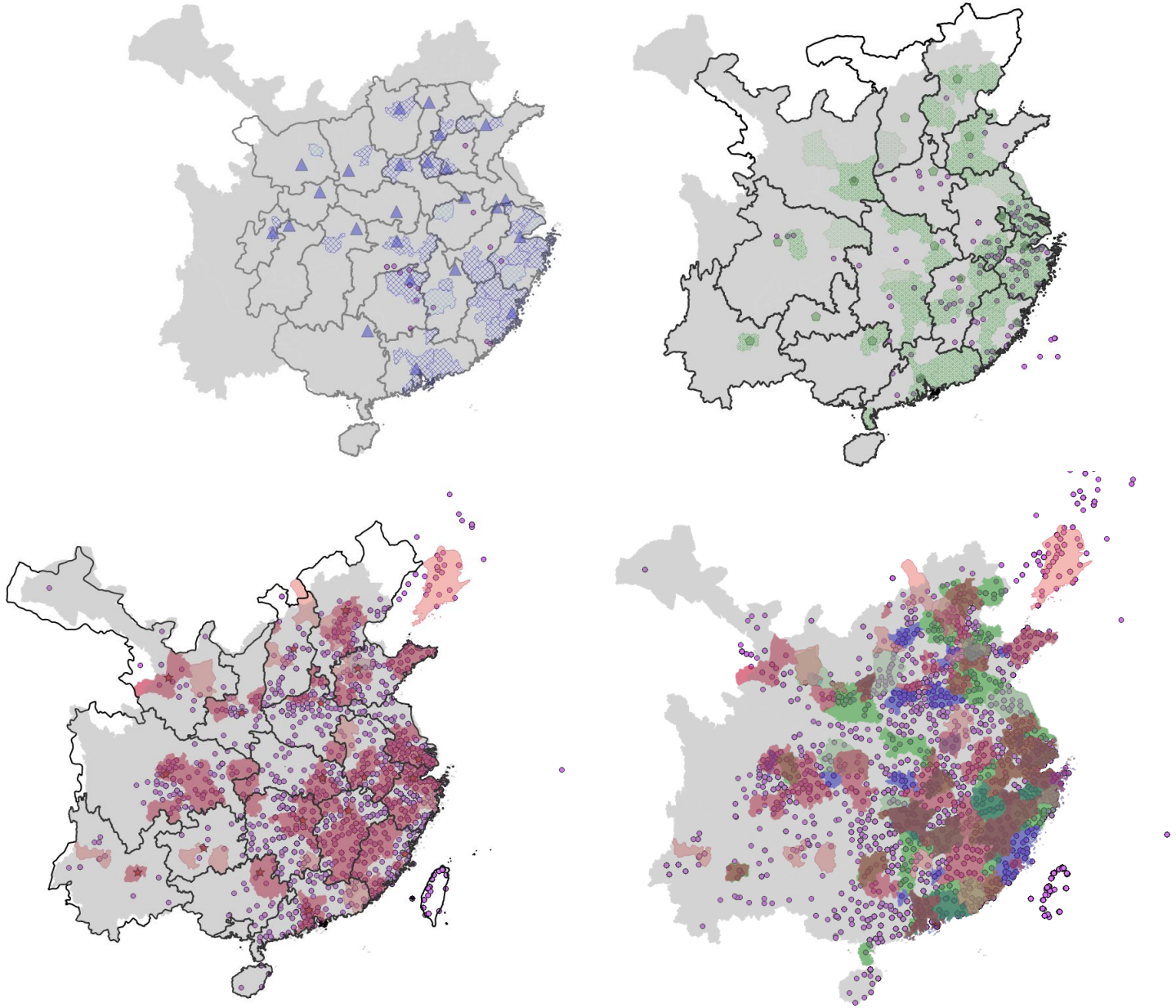


Table A1: Proximity and Courier Stations

Dependent Variable:	# Courier Stations	$\mathbb{1}_{\text{Courier Station}}$
	(1)	(2)
Proximity	0.803***	0.074**
	(0.226)	(0.031)
Number of Prefectures	267	267
R-squared	0.148	0.150

Notes: Robust standard errors are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Results are based on a cross-sectional sample of 952 courier stations in the Ming dynasty. Column 1 uses the number of couriers stations in a prefecture as the dependent variable, while column 2 uses a dummy variable indicating whether a prefecture has a courier station as the dependent variable. Both columns include province fixed effects

Table A2: Summary Statistics

	Song	Ming	Qing	All
Raw Data				–
Number of Prefecture	335	245	266	–
Historical Prefectures with Strong Clans	39	53	81	–
Number of Provinces	24	15	18	–
Prefecture Panel				
Number of Prefectures	242	267	267	–
Proximity	-0.471	-0.608	-0.494	-0.526
	[0.851]	[0.786]	[0.762]	[0.800]
Clan Prefecture(dummy)	0.194	0.363	0.363	0.301
	[0.396]	[0.482]	[0.482]	[0.459]
Clan Coverage (Percentage)	0.204	0.361	0.368	0.315
	[0.338]	[0.429]	[0.399]	[0.399]
Population Density	0.119	0.288	1.164	0.537
	[0.112]	[0.443]	[1.046]	[0.811]

Notes: The top panel shows the statistics based on the raw data, while the bottom panel shows the summary statistics from the prefecture-panel dataset. Counts or variable means are shown in each column. Standard deviations are in brackets.

Table A3: Proximity and Clan Land Establishment (Grid-level Analysis)

Grid Size:	100 Km^2 Grid		1 Degree Grid		150 Km^2 Grid	
Dependent Variable:	Clan (Dummy)	Clan (Percentage)	Clan (Dummy)	Clan (Percentage)	Clan (Dummy)	Clan (Percentage)
	(1)	(2)	(3)	(4)	(5)	(6)
Proximity	0.229***	0.115***	0.146***	0.100***	0.178***	0.062**
	(0.045)	(0.030)	(0.042)	(0.025)	(0.059)	(0.030)
Observations	1,109	1,109	1,105	1,105	627	627
R-squared	0.334	0.355	0.339	0.378	0.402	0.424
Province by Dynasty FE	Y	Y	Y	Y	Y	Y
Cluster at Grid	Y	Y	Y	Y	Y	Y
Grid FE	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y
Dep. Var Mean	0.391	0.227	0.356	0.189	0.381	0.182
Number of Grids	441	441	444	444	253	253

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. Panel datasets are at the grid-dynasty level. The dependent variable for odd-numbered columns uses a dummy measure which takes a value of 1 if more than 50% of the grid is covered by *historical prefectures with powerful clans*; while even-numbered columns use a continuous measure which equals to the proportion of the grid is covered by *historical prefectures with powerful clans*. All columns include prefecture fixed effects and province effects. Even-numbered columns additionally control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table A4: Proximity and Clan Land Establishment (Judicial Capitals)

Dependent Variable:	Clan Prefecture (Dummy)		Clan Coverage (Percentage)	
	(1)	(2)	(3)	(4)
Proximity	0.049*	0.050*	0.050**	0.048**
	(0.027)	(0.029)	(0.022)	(0.023)
Observations	776	776	776	776
R-squared	0.271	0.314	0.310	0.360
Number of Prefectures	267	267	267	267
Province by Dynasty FE	Y	Y	Y	Y
Cluster at Prefecture	Y	Y	Y	Y
Prefecture FE	Y	Y	Y	Y
Controls	N	Y	N	Y
Dep. Var Mean	0.311	0.311	0.315	0.315

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The dependent variable for columns (1) and (2) use a dummy measure which takes a value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory; while columns (3) and (4) use a continuous measure which equals to the proportion of the prefecture's territory is covered by *historical prefectures with powerful clans*. Proximity to judicial capitals for the Song dynasty is used as the explanatory variable. All columns include prefecture fixed effects and province fixed effects. Columns (2) and (4) also control for interaction terms between prefecture characteristics and dynasty fixed effects.

Table A5: Economic Development (Song, Ming Dynasties only)

Dependent Variable:	Dynasty Earliest Pop. Density	
	(1)	(2)
Proximity	-0.001	-0.033
	(0.014)	(0.024)
Observations	509	509
R-squared	0.667	0.770
Number of Prefectures	267	267
Controls	N	Y
Dep. Var Mean	0.208	0.208

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The sample uses the Song and Ming dynasties only. Dynasty's earliest population density refers to the earliest population density data available for each dynasty. Both columns include prefecture fixed effects and province-by-dynasty fixed effects. Column (2) additionally controls for interaction terms between prefecture characteristics and dynasty fixed effects.

Table A6: Clan Genealogy Data and Clan Land Data

Dependent Variable:	Clan Prefecture (Dummy)			Clan Coverage (Percentage)		
	(1)	(2)	(3)	(4)	(5)	(6)
ln(# Clans Compiled Genealogy +1)	0.091***	0.079***	0.064**	0.087***	0.058***	0.044*
	(0.011)	(0.026)	(0.028)	(0.009)	(0.021)	(0.023)
Observations	776	776	776	776	776	776
R-squared	0.086	0.283	0.320	0.107	0.317	0.362
Number of Prefectures	267	267	267	267	267	267
Cluster at Prefecture	Y	Y	Y	Y	Y	Y
Province by Dynasty FE	N	Y	Y	N	Y	Y
Prefecture FE	N	Y	Y	N	Y	Y
Controls	N	N	Y	N	N	Y

Notes: Robust standard errors, clustered at the district level, are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. The dependent variable for columns (1) and (2) use a dummy measure which takes a value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory; while columns (3) and (4) use a continuous measure which equals to the proportion of the prefecture's territory is covered by *historical prefectures with powerful clans*. The number of clans compiled genealogy (in natural logarithm) is used as the explanatory variable. Considering some prefectures might have zero clans compiled genealogies in a dynasty, I add 1 to the number of clans before taking the natural logarithm. Columns (2) and (5) include prefecture fixed effects and province-by-dynasty fixed effects. Columns (3) and (6) also control prefecture characteristics' interaction with dynasty fixed effects.

Appendix II: Additional Background

II.I Two Principles of Drawing Provincial Boundaries

During the early history, it was a very natural choice to adopt the principle of "following the forms of mountains and rivers" to draw provincial boundaries since it serves many economic and political benefits. Firstly, natural boundaries usually coincide with the agricultural regions, which form different agriculture types and therefore different cultures and norms. In addition, it vastly lowers the administrative cost since crossing mountains or rivers would have resulted in huge transportation costs. Lastly and arguably most importantly, natural boundaries serve an essential role in military defense. For example, during the three Kingdoms period (220—280 A.D.), Zhuge Liang–the chancellor and later the regent of one of the three Kingdoms Shu Han–suggested to his King (Liu Bei) to occupy Yizhou (roughly today's Sichuan province), since mountains surround it. The hills create natural barriers to prevent the other kingdoms' attacks. This strategy indeed really helped. It is commonly acknowledged that Shu Han was a much smaller kingdom and had a relatively weak military. Still, Shu Han managed to sustain conflict with the other Kingdoms for a long period of time because its natural boundaries protected it.

However, despite the benefits of using natural boundaries, its drawbacks also became more evident and severe as national territories got larger. The most important one is the central state could easily lose control over the territories as regional power holders (such as provincial governor, duke, military commissioners, etc.) could take advantage of natural boundaries to isolate the territories from the central state. This happened many times in history. For example, a long period of war and chaos was experienced at the end of the Tang dynasty (618 – 907 A.D.) because governors or military commissioners gained significant autonomy, and many became warlords and defected from the central state. The central empire could not suppress them despite many attempts because the natural boundaries now became barriers for the central forces to regain control. The breakaway of and occupation of territories eventually led to the collapse of the dynasty.

One solution would be dividing the whole nation into many smaller provinces. This way could limit the power and autonomy each regional power holder can get. Hence, although the Song dynasty (960–1279 A.D.) had much smaller territories, it had many more provinces than any of the following dynasties. The shortcoming of this solution is also apparent: the administrative costs would be extremely high. Having more provinces means hiring more officials at each level.

This solution became very unattractive for the Yuan dynasty (1277—1368 A.D.) when

the Mongols came to rule, as their territories became immense. As a result, another principle is known as "*interlocked like dog's teeth*", which means including rivers and mountains within provinces, was adopted. The benefit of this new principle is that it can prevent the regional power-holders from gaining autonomy while keeping the administrative costs low. As a result, despite the humongous territories, it only had ten provinces.[39]

When the Ming dynasty and the Qing dynasty came into power, they mixed the two principles (more of the second principle), which also resulted in more provinces than the Yuan dynasty (15 provinces and 18 Provinces in China proper regions for the Ming dynasty and the Qing dynasty respectively).

II.II How were the provincial boundaries in the Ming, Qing dynasties drawn?

How were the exact provincial boundaries drawn in the Song, Ming, and Qing dynasties? The Song dynasty, as mentioned before, was primarily determined by natural boundaries. The Ming dynasty redrew all the provincial boundaries by combining both the principles of "*following the forms of mountains and rivers*" and "*interlocked like dog's teeth*". However, not many studies exist of the precise process for drawing the provincial boundaries. Zhou (2013) mentioned that some provinces' boundaries were the frontline of the war when the fire was ceased. It took the Ming's army a long time–21 years in total– to overthrow the Yuan dynasty completely, and hence, the Ming army would draw the boundary as the new territories were conquered and start its governance. In some other provinces, the boundaries were drawn based on the emperor's ideology. For example, the first emperor of the Ming dynasty wants to include his hometown in the same province as the Imperial capital (Nanjing), which is almost 200km away. This resulted in Nanjing becoming a huge province, which is equivalent to the three provinces in today's China.

The Qing dynasty inherited most of the Ming dynasty's boundary, except for dividing three provinces that were considered too large in half. This includes dividing Jiangnan province into Jiangsu province and Anhui province; dividing Shangxi province into Shangxi province and Gansu province; and dividing Huguang province into Hunan province and Hubei province.

Although the precise boundary location was not clearly documented–probably because of the randomness in its nature—one thing was clear: as many scholars pointed out (Skinner, 1977; Zhou, 1998, 2013), the administrative boundaries in late Imperial China seldom coincide with culture or any human and economic activities and were generally considered

[39]The Yuan dynasty had more than 1400 km^2 in its territories.

as "administrative accidents".

II.III Other Pubic Goods Providing Local Institutions

In this paper, I focus on clans as the public good providing local institutions. Of course, there were other local institutions that provided public goods during Imperial China. Here, I would briefly discuss their roles and why they are less suitable for this study.

Buddhist Temples

Like many western countries, religious groups played a role in providing public goods, particularly relief for impoverished people. When Buddhism was introduced into China around 67 A.D., the Buddhist temples were not popular and did not take any social roles in public goods provision. It was until the end of the fifth century when Kings, aristocrats, landowners became adherents of Buddhism. Buddhist temples started to own assets and gradually began to take a role in public goods provision and disaster relief (Gernet, 1956). In the sixth and the seventh centuries, many Buddhist temples divided their land into three categories: one is used to support parents (*En Tian*); one is dedicated to generating funding for worship the Buddhas (*Jing Tian*), and one is used for disaster relief and helping the improvised people (*Bei Tian*). During this time, the Buddist temple was actively involved in many public goods provisions, including local roads, bridges, dams, and irrigation systems. Buddhist Temples also established philanthropic organizations (*Bei Tian Yuan*) using the funding generated from the land.

The influence of Buddhist temples spread fast and started to pose an alert to the state. In 717 A.D., Song Jing, the Grand Chancellor, suggested to the emperor Xuan Zong that the state should regulate these Buddhist temples and restrict their charitable roles. In 734 A.D., the emperor nationalized all the existing philanthropic organizations, making local government fund these philanthropic organizations. In 845 A.D., the emperor Wu Zong enacted a mandate to demolish more than 40,000 Buddhist temples and forced monks to resume secular life.

In late 900, when a new regime, the Song dynasty, came into power, Buddhist temples were rebuilt. The dynasty steadily regained its influence and participated in public goods provision such as building local roads and dams. However, most cases were coerced by local governments. The Buddhist temples never got back to their glory during the sixth and seventh centuries (Liang, 2001).

Most of the peak time of Buddhist temples was warring when the society was less stable and central state administration was hard to measure, making it unsuitable for this study.

After the massive demolish in 845, Buddhist temples had limited influence in public good provisions.

Charities

Since philanthropic organizations were nationalized, the state started to take active roles in charitable activities. This peaked in the Song dynasty when the government opened many different types of charities. However, this also caused a significant fiscal burden on the state. When the Yuan dynasty overthrew the Song dynasty, the new regime did not continue to fund these charities. In the Yuan dynasty, the government only kept medical-related charities (*Hui Min Yao Ju*).

In the Ming dynasty, even medical-related charities lost their vitality. However, during the end of the Ming dynasty, local elites gradually took the role of the state and established charities. The first known charity established by local people was founded in 1590. Since then, many charities local elites have established many charities. Some were focused on raising orphans, while some were focused on giving medicines for the sick and the poor. These charities groups were usually organised by a small number of people who would appeal to donations from the kind.

In 1724, during the Qing dynasty, Emperor Yong Zheng announced to encourage more charities. Since then, the state has provided grants and subsidies to these charity groups. For example, from 1736 to 1799, the central government issued yearly subsidies to 16 charities, which included a grant of 30,000 *liang* (a unit for weight 1 *liang*=50 grams) silver to a charity for the orphan (*Yu Yin Tang*) in Hubei province.

Charities can only be considered local institutions since the end of the Ming dynasty, as it was a part of the state institutions in the Song and Ming dynasties. Hence, it essentially only played a role in Chinese history for one dynasty (the Qing dynasty). This made it less suitable for this study, as its distribution might be confounded by many factors, and hard to isolate the effect of central administrative from other factors such as culture.

However, one concern might be that charities and clans coexisted during the Qing dynasty. If charities were prevalent in places where clans were weak, then using clans alone to measure local institutions might bias my results. To assess this, I combine geo-coded charities data in the Qing dynasty provided by Havard World Map with the clan data. I first check the correlation between the two clan measures and charities, and they are positively correlated. Further, Table A7 also shows that similar to the patterns of clans, there were more charities when it is closer to the provincial capitals.

Table A7: Clan Land Data and Charity Data

Dependent Variable:	Clan Prefecture (Dummy)			Clan Coverage (Percentage)			ln(# of Charities +1)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(# of Charities +1)	0.124***	0.124***	0.075**	0.117***	0.123***	0.082***		
	(0.016)	(0.025)	(0.030)	(0.013)	(0.020)	(0.023)		
Proximity (-ln(dist))							0.341***	0.127**
							(0.056)	(0.061)
Observations	267	267	267	267	267	267	776	776
R-squared	0.154	0.203	0.261	0.196	0.250	0.309	0.550	0.619
Province FE	N	Y	Y	N	Y	Y	Y	Y
Controls	N	N	Y	N	N	Y	N	Y

Notes: Robust standard errors are shown in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%. This table uses a cross-sectional sample for the Qing dynasty. The dependent variable for columns (1)-(3) use a dummy measure which takes value of 1 if *historical prefectures with powerful clans* cover more than 50% of the prefecture's territory; while columns (4)-(6) use a continuous measure which equals to the percentage of the prefecture's territory is covered by *historical prefectures with powerful clans*. ln(# of Charities +1) is the number of charities in each prefecture during the Qing dynasty (in natural logarithm). Considering some prefectures might have zero charity, I add 1 to the number of charities before taking the natural logarithm.

Appendix III: Panel Construction - Examples

I use prefectures in a fixed layer—P.R. China 2010 prefecture boundaries—as the unit of analysis. To illustrate how this maps onto corresponding historical prefecture boundaries, I use four prefectures in P.R. China 2010 (enumerated 1 to 4 in panel (a) in Figure A6) as examples.

The mapping process follows these steps:

1. **Overlay the Prefecture**: Overlay the 2010 prefecture boundaries with historical prefecture boundaries (panel (b)).

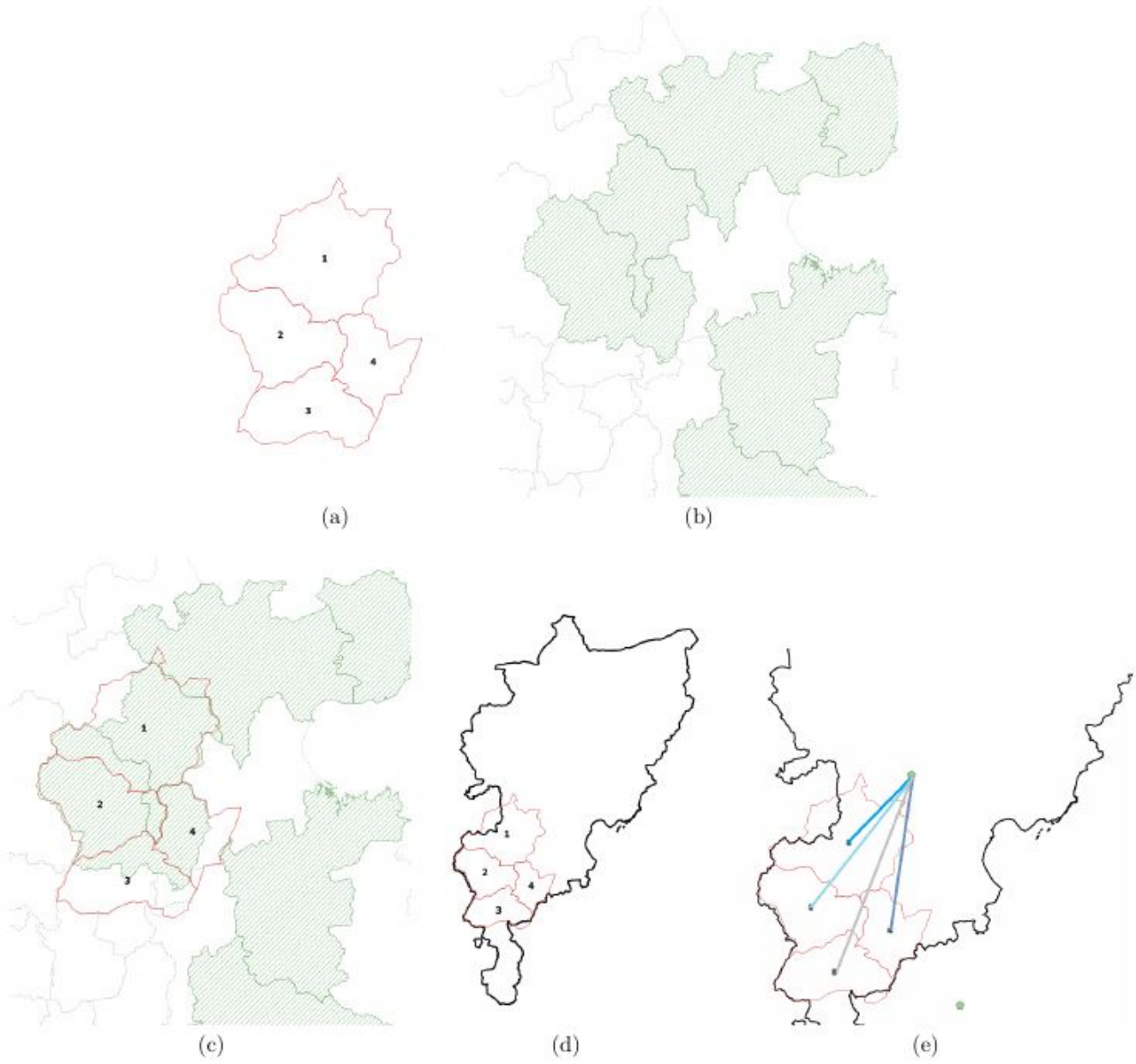
2. **Calculate Area Percentage:** Calculate the percentage of the area in the 2010 prefectures covered by *historical prefectures with powerful clans* (i.e., the percentage of the areas of the four prefectures covered by green shades in panel (c)). For these four prefectures, the percentages are 0.9, 0.99, 0.33, and 0.68, respectively.

3. **Define variables:** This percentage serves as the continuous measure used in the paper. For the dummy measure, it takes the value of 1 if the percentage is more than 50%. In the case of these four prefectures, prefecture 3 will take a value of 0, and the rest will take a value of 1.

4. **Assign Prefectures to Historical Province:** Each prefecture is assigned to a historical province. For example, prefecture 1 has some areas belonging to a neighboring province, but the majority of its territory belongs to the province shown within the black boundary in panel (d). Thus, prefecture 1 is assigned to this province. More specifically, the prefecture is allocated to the province that has the largest share of its territory.

5. **Calculate Proximity to Provincial Capital:** Finally, calculate the proximity of the prefecture to the provincial capital using the negative-log distance.

Figure A6: Panel Construction – Examples



Appendix IV: Model

To formulate the trade-off states face in co-opting local elites, I develop a simple riot model, where peasants can choose to riot, and the state could either delegate the task of suppressing conflict to the local elites or suppress the conflict directly when it happens. Here, I focus on one specific role that the state often delegates to the local elites–peacekeeping–just as an example. Many other roles, such as tax collection, would have very similar features and therefore share the same trade-offs.

The Set-up:

The local region is endowed with some wealth (W). The state would have to decide whether to let the local elites administer local affairs ($L = 1$ if co-opting local elites or $L = 0$ if not). The state's strength in administration (which was empirically approximated by proximity to the provincial capital in the paper) is denoted as S. If the state employs local elites (i.e., $L = 1$), they have to incur monitoring costs $C(S)$ to ensure that the empowered elite will not defeat his role as an agent. This cost increases as state administrative capacity decreases (i.e., $C'(S) < 0$). Once the decision has been made, an idiosyncratic shock (δ) would hit the local wealth. For simplicity, I assume that it follows a uniform distribution ($\delta \sim [-\frac{1}{2}\Delta, \frac{1}{2}\Delta]$). Local wealth will thus become $W^p = W + \delta$.

Peasants can choose to riot ($v = 1$) or not ($v = 0$). Rioting would give them a chance to get tax exempted if peasants win. However, if they lose, they will be punished. The state would take all of their wealth except a bare minimum $\underline{w}$ for them. Also, a fraction of the wealth β will be destroyed if a riot happens (assume $\beta < \tau$ so peasants will not always prefer peace). I assume $\underline{w} < (1 - \beta)(W - \frac{1}{2}\Delta)$; that is, peasants always have a lower payoff when they lose the conflict. If they choose not to riot ($v = 0$), they will pay τ proportion of tax to the state, and the game ends.

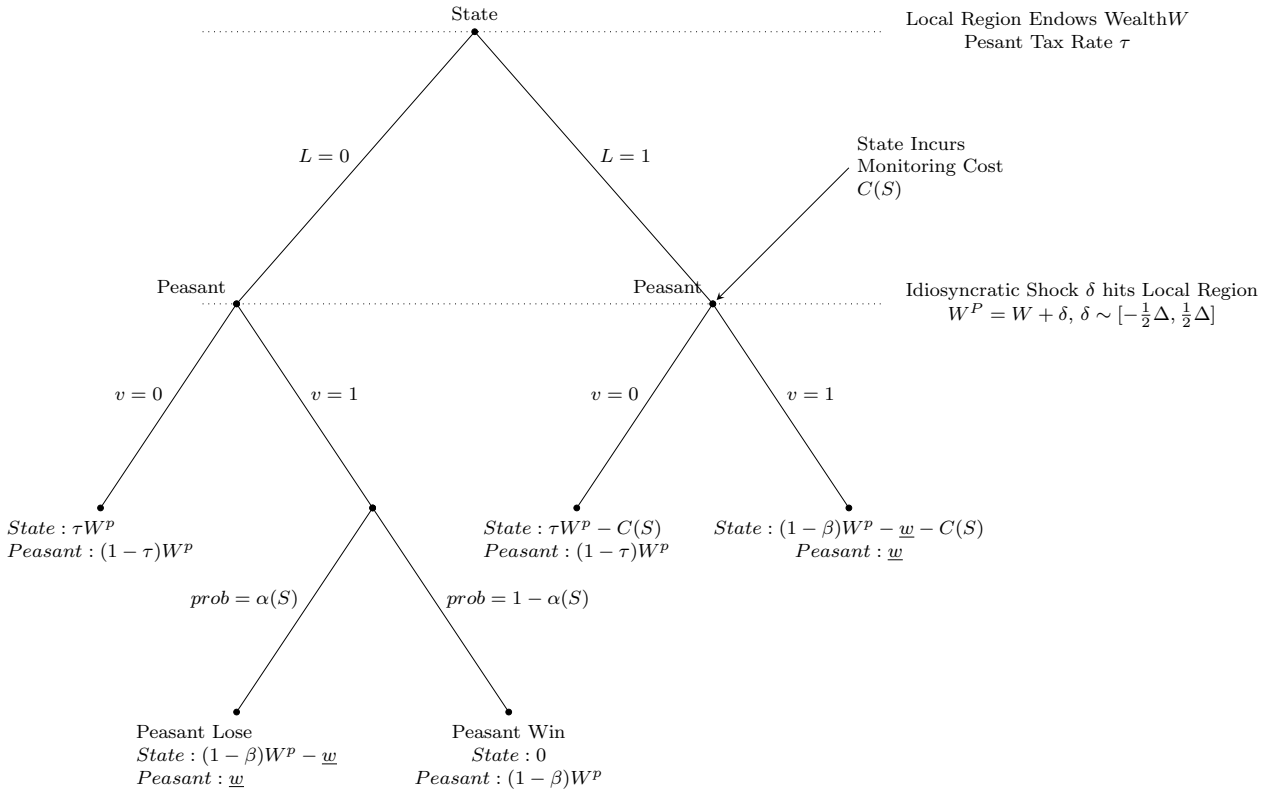
If peasants riot and the state has co-opted local elites $L = 1$, then local elites would be the ones who manage the conflict. Due to the state monitoring, elites will always put effort into suppressing the conflict. In addition, I assume elites could always successfully suppress the conflict as they have more local information and are better connected with the peasants. However, the state would need to suppress the conflict directly if it has chosen not to co-opt local elites (i.e., $L = 0$). In this case, the state has a probability of $\alpha(S)$ to successfully suppress the conflict. I assume when the state has a higher administrative capacity, it will have a higher chance of winning (i.e., $\alpha'(S) > 0$).

To ensure that the state is absolutely conflict-averse, I assume $[\tau - \alpha(S)(1 - \beta)]W + \alpha(S)\underline{w} > 0$, for all S, so that state will not have monetary gains when facing a conflict. Also,

for peasants not always have a preference for violence over peace $\alpha(S) > \tau - (1-\alpha(S))\beta$ for all S (i.e., the probability that the state would win a conflict is above a threshold value) is required.

Finally, I assume $W > \frac{\alpha(S)\underline{w}}{\alpha(S)-\tau+(1-\alpha(S))\beta}$ and $W - \frac{1}{2}\Delta < \frac{\alpha(S)\underline{w}}{\alpha(S)-\tau+(1-\alpha(S))\beta}$ to make sure that neither conflict of peace is not always preferred by the peasant so we could focus on the interior solutions.

The timing of events and the payoff for each party are summarized as follows:



Equilibrium:

Peasant:

As a peasant riot will never succeed when local elites are co-opted ($L = 1$), peasants will only choose $v = 1$, if $L = 0$ and the expected payoff of rioting is greater than peace. That is, when:

$$(1-\alpha(S))(1-\beta)W^p + \alpha(S)\underline{w} \geq (1-\tau)W^p$$

$$W^p = W + \delta \leq \frac{\alpha(S)\underline{w}}{\alpha(S) - \tau + (1-\alpha(S))\beta}$$

This gives probability of conflict $P(W, \underline{w}, \alpha, \tau, \beta) = \frac{1}{\Delta}\frac{\alpha(S)\underline{w}}{\alpha(S)-\tau+(1-\alpha(S))\beta} + \frac{1}{2}$

State:

While the state will have to weigh the trade-off between the cost of monitoring the empowered local elites and the costs of directly mitigating the conflicts and offer $L = 1$ if

$$\tau W - C(S) \geq P\{(1-\alpha(S)) * 0 + \alpha(S)\left[(1-\beta)W - \underline{w}\right]\} + (1-P)\tau W$$
$$C(S) \leq \underbrace{P\{\left[\tau - \alpha(S)(1-\beta)\right]W + \alpha(S)\underline{w}\}}_{\equiv X(W^i, \underline{w}, \alpha, \tau, \beta)}$$

Comparative Statistics:

The right-hand side of the above inequality illustrates the expected cost of attaining tax revenue (τW) absent the involvement of local elites, and it can be shown that:

$$\frac{dX}{dS} = \frac{dX}{d\alpha(S)}\frac{d\alpha(S)}{dS} = \underbrace{\frac{dP}{d\alpha(S)}}_{<0}\underbrace{\frac{d\alpha(S)}{dS}}_{>0}\underbrace{\{\left[\tau - \alpha(S)(1-\beta)\right]W + \alpha(S)\underline{w}\}}_{>0}$$
$$+ P\underbrace{\left[-(1-\beta)W + \underline{w}\right]}_{<0}\underbrace{\frac{d\alpha(S)}{dS}}_{>0} < 0$$

Intuitively, when a state is stronger and thus has better technology to suppress conflict, this would deter peasants from starting the conflict (probability of conflict P would be lower). Moreover, the expected cost of attaining tax revenue (τW) is lower for a strong state because it is more likely to win a conflict and thus faces a smaller expected loss. Therefore, it is less costly for the state to suppress the conflict directly, suggesting less incentive to co-opt local elites.

The left-hand side of this inequality illustrates that a stronger state would have lower monitoring costs and thus prefers co-opting local elites. That is, $\frac{dC(S)}{dS} < 0$

Taking together,

$$\frac{dL}{dS} = \underbrace{\frac{dL}{dC(S)}}_{<0}\underbrace{\frac{dC(S)}{dS}}_{<0} + \underbrace{\frac{dX}{dS}}_{<0}$$

This illustrates the aforementioned trade-offs: a stronger state faces both costs in mitigating conflict directly as well as co-opting local elites to do so. Hence, it is theoretically ambiguous whether the state would co-opt more local elites (and thus have more local institutions) when the state administrative capacity is stronger.