

# States and Wars: China's Long March towards Unity and its Consequences, 221 BC – 1911 AD\*

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**Abstract:** Based on the compilation of a large geocoded annual data series of political regimes and incidences of warfare between 221 BC and 1911 AD, we provide both qualitative and quantitative evidences to show that the mythical historical Chinese rests in a tripartite synthesis of China's unique geography (of environmental circumscription), ideology (of a single unified ruler for all) and institution (of direct administrative rule). By classifying our data sets into two types of regimes - agrarian and nomadic - and three types of warfare-agrarian/nomadic, agrarian/agrarian and internal rebellions - as fought between and within the two regimes, our econometric exercise shows that the unity is forged through nomadic-agrarian warfare which leads to a reduction in the number of agrarian regimes but an increase in their territorial size. Our paper also provides the first direct quantification of ideology based on the application of the latest textual analytical tool of python to the Classical Chinese primary sources.

**Keywords:** Agrarian-nomadic warfare, ideology, China, country size, state formation, warfare

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「天下大勢，分久必合，合久必分」

Those long divided shall be united;

those long united shall be divided:

such is the way of the world under the heaven.

*The Romance of Three Kingdoms* 三国演义 by Guanzhong Luo (14<sup>th</sup> century)

## 1. Introduction

The line above that opens the *Romance of the Three Kingdoms* – one of China's most famous historical novels written in the 14<sup>th</sup> century – encapsulates China's deeply embedded belief in the historical inevitability of cycles of imperial fragmentation and unification. The novel itself – part history and part fiction – narrates the legendary rise and fall of three independent kingdoms in China's Northern, Central and Southwestern regions during 169-280 AD. The three kingdom era came into being after the fall of the Han dynasty, an empire that matched the scale of contemporaneous Roman empire in Europe. Ironically, during the 14<sup>th</sup> century when the novel was published, political fragmentation as in the Three Kingdom era had long been a nostalgic – albeit romantic - memory. China by then had come under the firm grip of a single unified ruler while fragmentation became deeply entrenched in Europe since the fall of the Roman Empire.

The unparalleled Chinese unity remained an enduring riddle in world history, possibly the mega-puzzle behind all others in Chinese history ranging from the Needham puzzle – why industrialization did not take off in China's glorious Song era (AD 960-1279) – to the Great

Divergence debate – why China fell behind Western Europe in early modern or modern era.<sup>1</sup> The consequence of Chinese unity – its pros and cons as compared with the European pattern fragmentation – has often been alleged to have accounted for the contrast between European growth and Chinese stagnation in political cultural, intellectual, military and technological development and ultimately economic outcome (Baechler 1975; Diamond 1997, p. 414, Hoffman 2015; Mokyr 2016). A more recent literature more specifically extended this contrast to account for differential patterns of public finance, legal system, financial market and private property rights.<sup>2</sup>

Our paper represents one of the series of new scholarly attempts to explain the cause –not just the consequence – of Chinese unity often under a single ruler, hereafter referred to as Grand Unity. Differentiated from previous studies, the central thesis of our paper locates the mythical unity of Chinese empire in a tripartite synthesis of a geography within a closed and circumscribed environment, the ideology of the legitimacy of a single unified ruler for all and the governing institutions of direct administrative rule. The sustainability of this synthesis was forged and re-enforced through two millennia of sustained warfare - in particular the agrarian-nomadic conflict - along either side of the Great Wall.<sup>3</sup> More importantly, we argue that both ideology and institutions persisted beyond those geographic factors and became self-fulfilling.

We start with China’s geographic location as a case of a closed space – or what some called

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<sup>1</sup> See Brandt et al. (2014). For an insightful Chinese language discussion on both the causes and phenomenon of Chinese unity, see Jin and Liu (2011).

<sup>2</sup> See Ma (2012); Ma and Rubin (2019) on the impact on Chinese public finance. On the other hand, see Rosenthal and Wong (2011) for the benefits of unification in China and Epstein (2000) for the cost of political fragmentation in Europe. Also see Alesina and Spolaore (2003, 2005) on the economic costs and benefits of the size of states.

<sup>3</sup> For the importance of geography and warfare, see two recent outstanding studies by Ko et al. 2018 and Fernández-Villaverde et al 2023. There has also been a long-standing literature that highlights the importance of wars and national defenses as critical factors for state formation often focused on the European experience with recent empirical works expanded to Asia and Africa. See Tilly 1985,1990; Turchin et al. 2006; Besley and Persson 2008; Turchin 2009; Turchin et al. 2013; Gupta et al. 2016; Dincecco and Wang 2018; Dincecco et al. 2019, Hoffman 2015.

“social cage or environmental circumscription” - bounded by Himalaya on the West and Pacific on the East. <sup>4</sup> This background of circumscribed geography along the East-West axis – the issue of China’s open Northern and Southern frontiers will be discussed later - may have spawned China’s precocious ideology of a single unified ruler – also referred to as Grand Unity (大一统) for all under the heaven (天下一家) – the second part of our tripartite explanation. The most concrete expression of Chinese geographic circumscription is in the legendary Chinese idea of Nine States (九州) as all under the Heaven (天下), a space constructed within China’s cosmology of spherical sky hovering over a square earth surrounded by seas on four sides. It is also a cultural space with Chinese civilization seated in the centre (hence the Central Kingdom) of a hierarchy emanating towards the outer peripheries defined by increasing degree of “barbarianess” 夷.<sup>5</sup> In this regard, the space for all under the heaven is both geographic and ideological.

Warfare and conquest to achieve unity within this legendary space and beyond led to massive resource mobilization that propelled the rise of Chinese institution characterized by absolutist rule, political centralization, direct administrative rule (郡县制) and the world’s first impersonal bureaucratic institution on a nationwide scale. This political regime was founded on an agrarian production system based on de-facto private property rights in land and small-holding peasantry. China’s geographic extension from the so-called Central Plain in Northern China - the original core of Chinese civilization – was also a process of incorporating and civilizing the so-called “barbarians” into a wide zone of a single Chinese rule for all the under heaven (Danjo 2016).

Ultimately, this very concept of agrarian based regime of Grand Unity met its real test: the vast Northern steppes frontier broadly north of the current Great Wall, a man-made infrastructure

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<sup>4</sup> See Mayshar et al (2017) and Allen (1997) on the importance of closed geographic space or the absence of the exit option as the critical element for the rise of coercive and centralized bureaucracy in ancient Egypt and Middle East.

<sup>5</sup> See Dangjo (2016, p. 17-18) Ge (2008, chapter 1). The word “Great Unity” (大一统) can be traced to *Gongyangzhuàn* (公羊传) a work existed in the Spring-Autumn period. For an extensive and insightful treatment on the rise of this ideology of a singular ruler, see *Nianjun Yang* 2023 and Puri Pines (2012) especially chapter 1.

broadly demarcating the vast ecological differences between China's agrarian and nomadic regions. Nomadic economies were shaped by very different political institutions and social structures, heavily dependent on the grazing of vast herds of animals but vulnerable to unfavorable continental climatic conditions with relatively little rainfall. The steppes environment in the nomadic or semi-nomadic areas led to the rise of tribal-based, loosely structured and mobile societies with unstable property rights, low capital accumulation and population density. The agrarian-based Chinese empire eventually attained unity first by sealing off the Northern frontier with the Great Wall, then – when that wall was repeatedly breached - through an Agrarian-Nomadic synthesis where nomadic rulers conquered the agrarian China but perpetuated or strengthened the agrarian based institution of absolutism based on centralization, bureaucracy and social control. But this agrarian-nomadic synthesis constantly pushes the boundaries of Chinese as a cultural identity as part of the legitimacy of Grand Unity. This leads to a process of ideological reconfiguration that redefines the identities of Chinese versus Barbarians throughout history. Hence, the pillar of China's Grand Unity rested on tripods of ideology, institutions and geography adapted to changing time throughout the two millennia.

We illustrate this shifting spatial and temporal dynamics of our tri-partite structure through the build-up of extensive statistics on the number and size of regimes or states, the locations of capitals and incidences of warfare for the entire two millennia between 221 BC and 1911 AD from both primary and secondary sources. Building on these statistics, we perform an econometric exercise on the impact of the incidences of warfare on state formation. We look at the entire two millennia across phases of fragmentation and unification with changing number and size of states over time. We classify our data sets into two types of regimes - agrarian and nomadic – and three types of warfare– agrarian/nomadic, agrarian/agrarian and internal rebellions – as fought between and within the two regimes. Applying an Autoregressive Distributed Lag (ARDL) model on our data sets, we find nomadic-agrarian warfare leads to a reduction in the number of agrarian regimes but an increase in their territorial size. We also adopt an IV approach to confirm the direction of causality between

warfare and state formation.

One distinctive contribution of our paper is to quantify the role of ideology based on the use of the latest textual analysis tool of python. By calculating the word frequency of several key terms related to the concept of Grand Unity ideology: the word “unify” and the character for “Han” Chinese and four different expressions of “barbarian” from the voluminous official Twenty Four Historical Annals, we reveal that these concepts occupied a central place in Chinese ideology through the rise and fall of so many different regimes and rulers with differing or overlapping cultural and ethnic identities for entire two millennia.

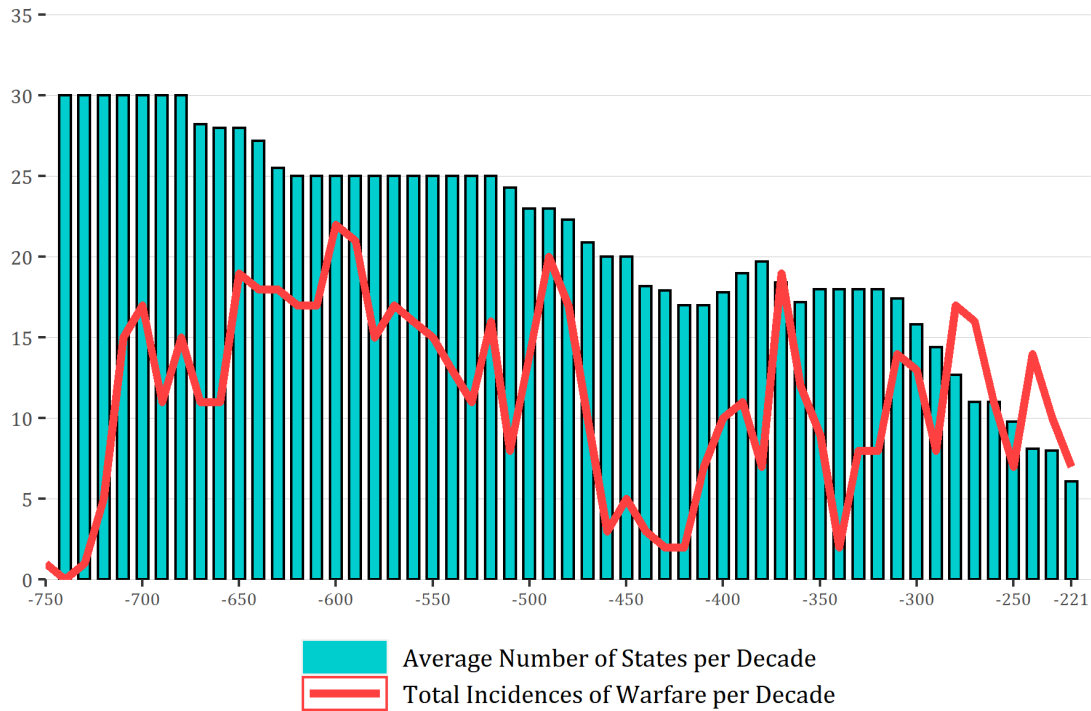
## 2. The Origin of an Ideology and Institution

China’s so-called Spring-Autumn and Warring States era (770BC – 221BC) saw a total of thirty political regimes in that contentious five centuries (see Appendix Table 1 for the full list of Chinese dynasties). Indeed, in contrast to the recent prevailing view that Chinese geography favored political unity (Diamond 1997), John King Fairbank, writing in the 1980s, argued exactly the opposite: “Chinese geographic terrain nurtured particularism and fragmentation as seen in the rise of more than 100 separate states or even 30 some states in the Warring State period (Fairbank 1987, p.15).”<sup>6</sup> Figure 1 captures this by plotting the total incidences of warfare and the number of states during this Spring-Autumn and Warring-States era. The first of the five centuries began with a total of 30 states but eventually shrank as warfare persisted and intensified. However, as shown in figure 1, the collapse towards a single state under China’s first emperor Qinshihuang 秦始皇, the one feature most distinguished from the European experience, as we show later, would turn out to have fateful historical consequence.

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<sup>6</sup> As Fairbank (1987) pointed out that geographically China is far from unified: “Yellow River, being generally unnavigable, does not link Shensi and Shansi to the area. Peripheral areas like Yunnan and especially Sichuan and Shanxi have fertile cores ringed by mountains, ideal for independent bases. The Yangzi gorges limit the eastern access to Sichuan and the Yellow River Plain in North China from Beijing to the Huai River is no easier to traverse than North European plain from the Urals to Hamburg, see Fairbank (1987, p. 19). Indeed, recent more systematic cartographic works reveals that China was actually more mountainous than Europe, see Hoffman 2015, Fernández-Villaverde et al 2023.

**Figure 1. States and Wars in 750 BC – 221 BC**



China’s Spring Autumn and Warring States era marked the beginning and organic growth of a set of Chinese ideology that was later to dominate Chinese ruling philosophy for the next two millennia. Two schools of thought, neither of which were oriented towards individuals or their rights, became the most prominent. Confucians emphasized certain virtues of a highly hierarchical and patriarchal society while Legalism promoted the state power at the expense of individuals.<sup>7</sup> In the end among the various schools that emerged in the Warring state period - or what Zhao Dinxin (2015) defined as the age of Total War - Legalism came to dominate practical politics. By advocating a form of military and administrative meritocracy governed by strict discipline of punishment and reward and through total political and social control, legalism served as the most potent instrument of rule propelling Qin’s unification conquest of China in 221 BC under the ruthless Qinshihuang. The key winning strategies of the Warring

<sup>7</sup> As expounded by Zhao (2015), all the major ancient Chinese philosophies based their reasoning on a strong sense of historical rationalism, which is to evaluate the effectiveness of an action through historical precedent and holistic/dialectic perspective, a contrast, for example to the Greek counterparts which tended to have an analytic and theoretical dimension (Zhao 2015, p.187).

State period included the replacement of local feudal control by direct administrative rule under the prefectural system (郡县制), the establishment of military-based meritocracy in place of hereditary nobility, the registration of agricultural land and households for direct taxation and military conscription and the promulgation of standardized legal codes under a system of collective punishment. The prefectural system had its origin in the military infantry developed for the state warfare and were based on the control and extraction of an agrarian based peasant household whose fixed location and land investment were much more susceptible to coercion and extraction.<sup>8</sup> In contrast, the rulers disparaged the highly mobile and elusive commercial capital and ranked merchants at the bottom of the social class. The Legalist teaching laid the very foundation for the rise of a Chinese absolutism (or something that comes closest to a form of pre-modern totalitarianism).<sup>9</sup> Similarly, as many argue, China's headlong plunge towards a single unitary state of Qin in 221 BC may have spelled the beginning of the end of Chinese intellectual and ideological diversity.

The Qin rule based on conquest and raw punishment became short-lived, collapsing in 15 years after the death of the first emperor. Subsequently, the second dynasty of Han that reunified China resurrected the once banished school of Confucius as the new ruling orthodox whose emphasis on social virtues, filial piety and social hierarchy softened the harshness of Legalism. In contrast to the Legalist doctrine of the prefectural system of direct administrative rule 郡县, Confucian was associated with a feudal regime (封建) by a nominal emperor at the top guarded by a coalition of relatively autonomous kings or lords. While both ideologies shared the ideal of a single ruler for all under the heaven, Legalist regime envisaged a far more centralized system than Confucianism for maintaining the "Grand Unity" (Zhao 2015). The outcome is a Confucian-Legalist synthesis with Confucianism supplying the ideology of persuasion and Legalism providing the instrument of coercion (Zhao 2015). The Confucius-Legalist synthesis created the ideological basis for a ruler-centered institution founded on

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<sup>8</sup> See Mayshar et al. (2020) for the importance of agricultural cultivation to the rise of bureaucracy and hierarchy.

<sup>9</sup> Chinese absolutism is more "absolute" than European versions who were often checked by religious actors, aristocrats and bourgeoisie. See Acemoglu and Robinson (2019), Ma 2012 and Zhao (2015, Chapter 7).



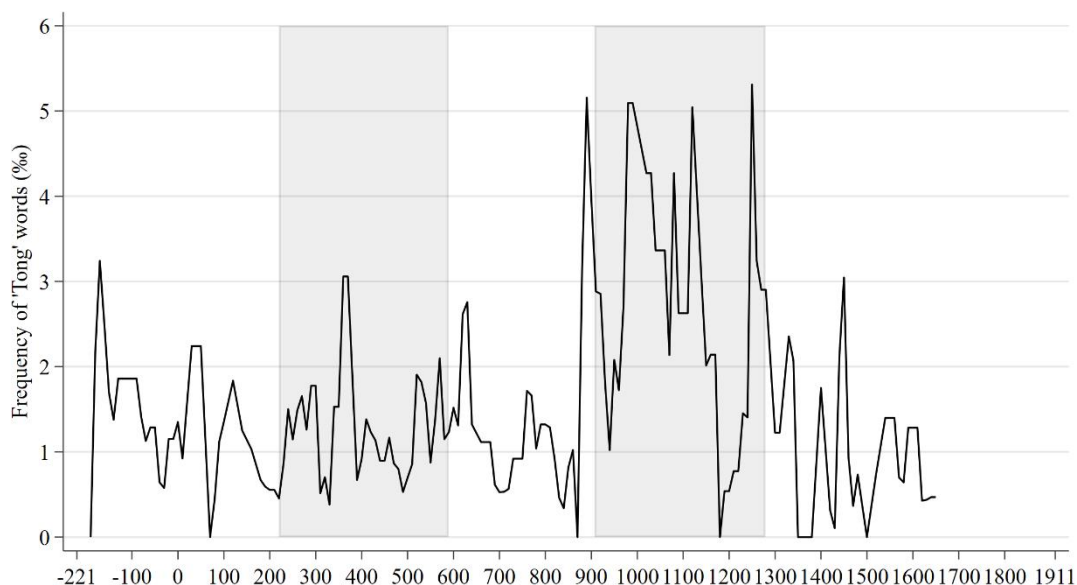
monopoly of power under a single ruler governed directly by an administrative bureaucracy in an agrarian based economy. The growth of the prefectural system eventually created a class of bureaucrats and scholarly elites based on the selection from China's renowned nationwide Civil Service Examination system inculcated in the teaching of Confucius classics. This scholarly class, subservient to and dependent upon the regime, supplied the ruler with ideological and political legitimacy (Ma 2012; Zhao 2015).

Fairbank (1987) pointed out that it is highly significant that the Confucian classics adopted by Han rulers as the orthodox arose before China's unification of 221 BC. The disorder of the centuries before 221BC sanctioned the ideal of a unified order during the two millennia to follow (p.20). The Grand Historian – China's most important historical annals published in 90BC – endorsed and celebrated the Qin unification as follows: "By annihilating the six kingdoms, annexing China and suppressing the four barbarians (Eastern Yi, Southern Man, West Rong and Northern Di), Qin restored peace to all under the heaven" (Danjo 2016, p. 11). In the end, the capacity to unify itself became the very legitimacy of the Chinese imperial rule. More importantly, as argued cogently by Jin and Liu (2011, chapter 5), the durability of this ideology and institution held the secret code behind imperial China's mythical resilience that not only sustained unity but also resurrected it each time after its collapse or prolonged phases of fragmentation.

We illustrate this durability of Grand Unity as an idea through a textual analysis using the python coding programming method. We extract the term "unification", "unity" spelled as "Tong" 统 in Chinese character from the official *Twenty-four Historical Annals* spanning the period of 2550 BC – 1644 AD. The Annals were widely regarded the official dynastic record covering wide-ranging topics of politics, economy, culture, astronomy and etc. As official annals used for promoting imperial legitimacy, it is ideal for our purpose. Figure 2 shows the concept of unity as an ideology sustained throughout the entire two millennia with a sharp surge during 900-1300 AD that corresponded the sustained period of military rivalry among imperial rulers of Song, Liao, Jin and Mongols vying for supremacy. To gauge the weight of the

Grand Unity in Chinese elite consciousness, we also calculate and compare the frequency or of a few other key political terms such as “emperors” 皇帝, “Confucian” 儒, “famine relief” 賑灾 which is a key marker of Chinese legitimacy. Compared with these three terms which have an average of 1.36‰, 0.43‰ and 2‰ respectively for period between 221 BC and 1644 AD, the frequency of the character “Tong” average a bit above 1.5‰ between 900 and 1644 AD and jumped to about 3‰.

**Figure 2: The Word Frequency (or Percentage Share) of 'Tong' 统 (Unity) in *Twenty-four Historical Annals* in 221BC - 1644 (in decade average)**



**Notes:** For the source of textual analysis using the python coding programming, we rely the official *Twenty-four Historical Annals* that spanned the period of 2550BC - 1644 AD. It is a very challenging task given that the Annals total 3213 volumes and about forty thousand words all in classical Chinese. We proceed in a series of steps. We choose the modern Chinese version of the 23 out of the 24 annals to cover the period of 221BC-1644. Among the annals, we choose the section on Emperor Chronicles 帝王纪 which records the history of emperors. For each word extracted, we aligned them against the beginning and end year of the imperial reign which were separately corrected. As Historical Annals were usually compiled by the succeeding dynasty, it did not include the last dynasty of Qing 1644-1911.

### 3. States

#### 3.1 Defining and Quantifying States and Regimes

When quantifying the number of states throughout Chinese history, we first need to define a historical territory consistently through time. In our study, we use the territory size of Qing in 1820 throughout, which was one of the largest territory the Chinese empire had ever achieved based on the atlas constructed by the landmark works of Tan (1996). It is important to emphasize that our choice to take this territory bears no direct reference to or implication for any claims of current and past Chinese national boundaries, or whether or not Qing China had exercised actual or nominal administrative control. It is rather to include the maximum number of relevant states contending for geo-political supremacy or survival in this China-dominated political order during the two millennia.

Given our interest, we classify the political regimes into two types: agrarian or nomadic. As the concept of agrarian versus nomadic overlaps with that of Chinese versus Barbarian, there are three different classifications by ethnicity, culture/politics –whether the rulers adopted agrarian or nomadic institutions and life styles and geography – whether the regime was located in the agrarian or nomadic territories (Danjo p. 16). Our classification starts with the geographic location of each regime’s respective capital – whether situated south or norther of the Great Wall – as the criteria. The political and geographic significance of the Great Wall as the dividing line between the agrarian and nomadic states have been long-noted (see for example, Lattimore, chapter XIV, Hu 1996). It was constructed for military purpose but also broadly corresponded to the 400 centimeter average rainfall that demarcated the agrarian and nomadic zones.

We capture the shift of the two regimes by resorting to the cultural/political criteria through re-classifying a nomadic regime as agrarian after they migrated and re-established their capital to the South of the Great Wall simply because they were adopting ideology and institutions of the agrarian regimes. The most typical examples are Yuan (1271-1368) and Qing dynasty (1636-1912). Established by the Mongols, but Yuan’s founding emperor, Kublai Khan moved her capital to Beijing in 1272 and began to take on agrarian institutions such as formalized bureaucracy and land-tax based fiscal system. Similarly, founded by Jurchen, a

semi-nomadic tribe in Northern China, the Qing ruler moved her capital from Shenyang (in today's Northeastern province of China) outside the Great Wall to Beijing in 1644, began a systematic process of adopting Chinese ideology and institutions and incorporating Han Chinese into the formal bureaucratic system. For now, we use the location of the capital rather than ethnicity of rulers as a criterion which is much more objective and suitable for our econometric exercise. We will discuss the role of ethnicities later.

Figure 3 displays the locations of all the imperial capitals of the two regimes between 221 BC and 1911 AD. Figure 4 plots the entire series of number of nomadic and agrarian regimes from 221 BC to 1912 AD (the final year of China's last dynasty of Qing). Our database reveal that more than ten nomadic tribes or nations established altogether thirty-three dynastic regimes while the mainly agrarian Chinese rulers established 76 different states throughout this period based on the criteria we set out.

**Figure 3. Geographic Locations of Capitals of Nomadic and Agrarian Regimes**

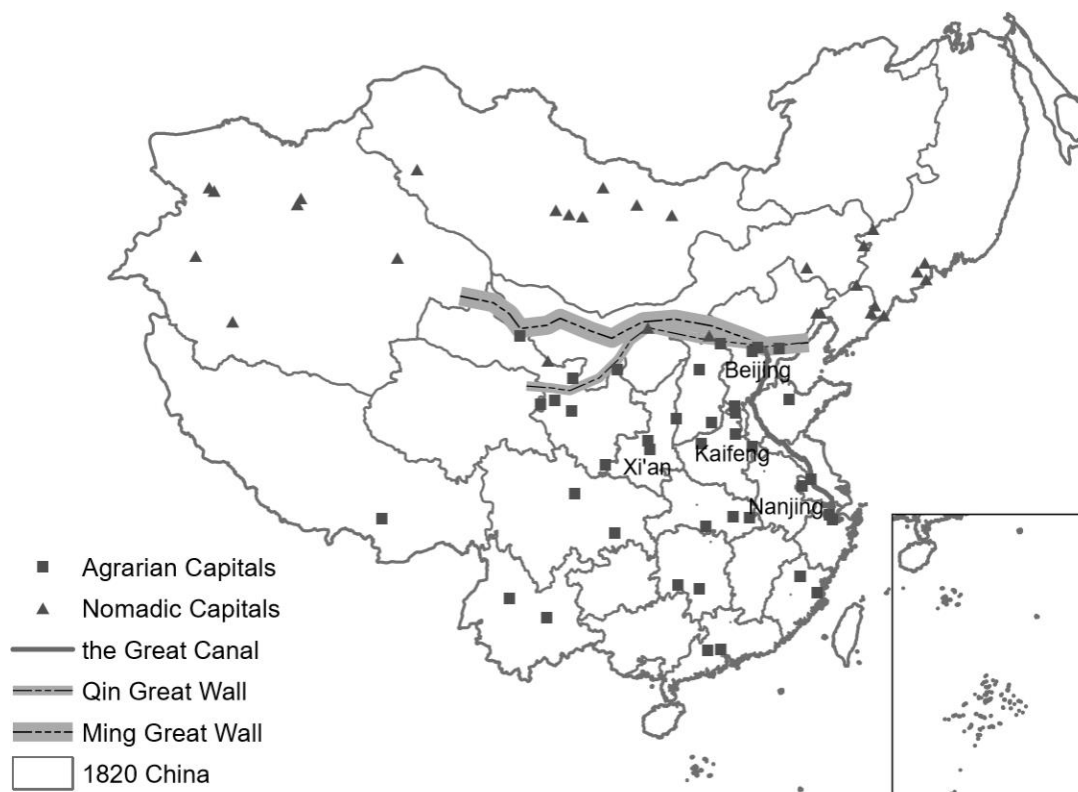
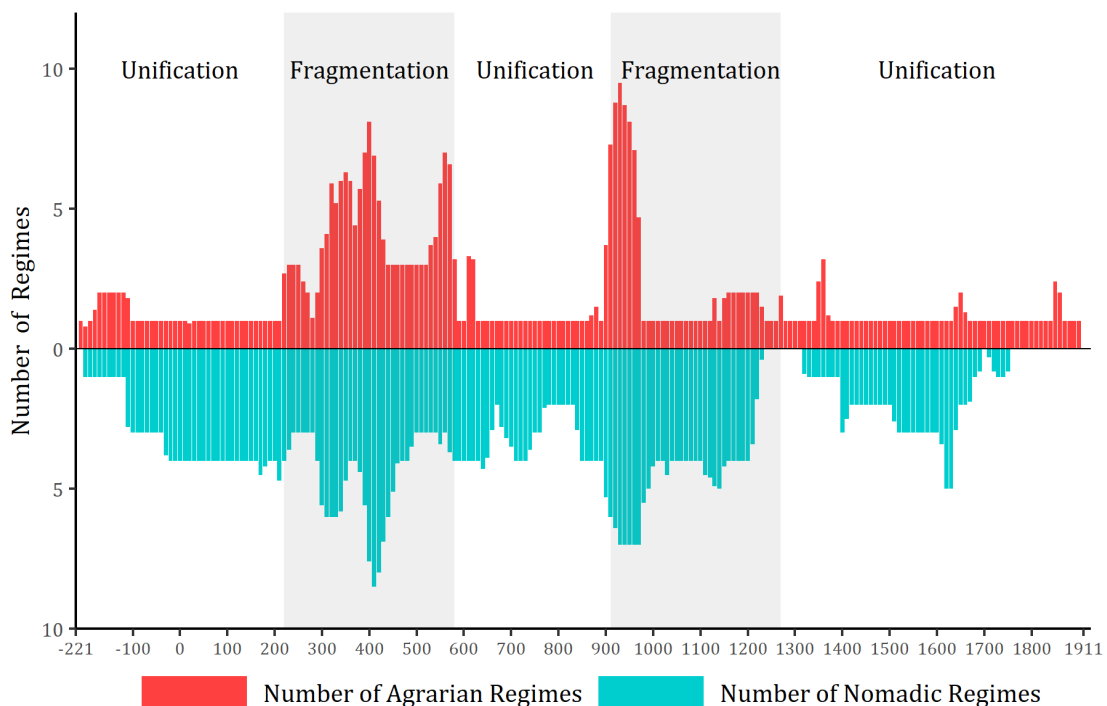


Figure 4 traces how this Chinese ideology of monopoly rule endured through the entire cycles of unification and fragmentation from 221 BC onward (see Appendix Table 1 for Chinese dynasties). It shows that China’s first phase of unification began with the rise of the Qin and Han dynasties between 3rd BC and 3rd AD. On the heels of this unification came the second phase of fragmentation (220 AD – 581 AD) in China’s so-called age of aristocracy that saw a total of ten nomadic regimes and thirty-five agrarian regimes along the north and south of China’s Great Wall respectively. Among these agrarian regimes included the legendary Three Kingdoms of Wei, Shu and Wu. After more than two and half centuries of fragmentation, reunification ensued the founding of Sui and Tang dynasties between 6<sup>th</sup> and 8<sup>th</sup> century, which at one point achieved a territory of 5.5 million square kilometers. But collapse of the Tang in 907 AD saw the re-emergence of China’s phase of fragmentation which lasted another 364 years. In the earlier phase of the so-called “Five Dynasties Ten Kingdoms” era (907-979), as many as seven nomadic and ten Han Chinese agrarian regimes co-existed.

**Figure 4. Agrarian and Nomadic Regimes in China during 221 BC – 1911 AD**



However, after the founding of the Northern Song in 960 up until the Mongol conquest in 1280,

political fragmentation in China took the form of sustained rivalry usually among the large political entities pitting Northern and Southern Song against the non-Han rulers of Liao, Jin, Qiang and later Mongol consecutively. Even this latter phase of fragmentation, a trend towards a single unitary rule began to strengthen from the tenth century (or Song) with periods of disintegration becoming shorter and the number of competing states smaller but their sizes larger. Chinese unification in the final and third phase became almost permanently entrenched following the founding of the Mongol dynasty in the 13<sup>th</sup> century. Fragmentation was by then more the subject of historical fiction such as the Ming era *Romance of the Three Kingdoms*.<sup>10</sup>

### **3.2 The Agrarian-Nomadic Divide and China's March towards Unity**

One important determinant to the contrasting institutional trajectories between the agrarian and nomadic regimes is the vastly different ecological and geographic conditions on either side of the Great Wall. Political rule on the agrarian side was firmly rooted in the establishment of a stable economic infrastructure and agrarian grain base marked by the construction of massive public works of water control, irrigation, dams and dikes – the foundation of what Wittfogel once termed as Oriental Despotism (Wittfogel 1957; Chi 1963).<sup>11</sup> As Chi's classic study reveals, the key to successful conquests and potential unification of China by any political regime hinges on its ability to secure and develop the agricultural base and transport links of a key economic area or areas as a reliable source of grain tribute (Chi 1963, p.5). Indeed, the control and development of the so-called fertile Guanzhong (关中) plain, centered around the imperial capital of what is today's Xi'an) was behind Qin and Han's first unification of China.<sup>12</sup> Along with the expansion of warfare and empire, China's key economic areas

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<sup>10</sup> Our quantitative data and narrative confirm much of the descriptive literature on dynastic cycles of unification and fragmentation. See Chi chapter 1, Barfield p.13, Lattimore, chapter XVII, Turchin et al. 2006.

<sup>11</sup> For an insightful critique on the Oriental Despotism thesis, see Zhao, p.204 who argued that it was bureaucratic-military state that led to the construction of infrastructure rather than the other way around. For the importance of cereal production and agricultural surplus in the rise bureaucracy on a global setting, see Mayshar et al. (2020).

<sup>12</sup> Hence, Fairbank concluded that China's ancient unity marked a triumph of human institutions over geography (1987, p.16).

shifted eastward and southward towards ever larger agrarian plains often through extensive construction of canal infrastructure and irrigation (Chi 1963). The most iconic is the construction of the Grand Canal from the 7<sup>th</sup> century that allowed China political regimes based in the North to reach the newly developed and highly productive economic zones of the Lower Yangzi delta (Chi 1963; Quan 1976).

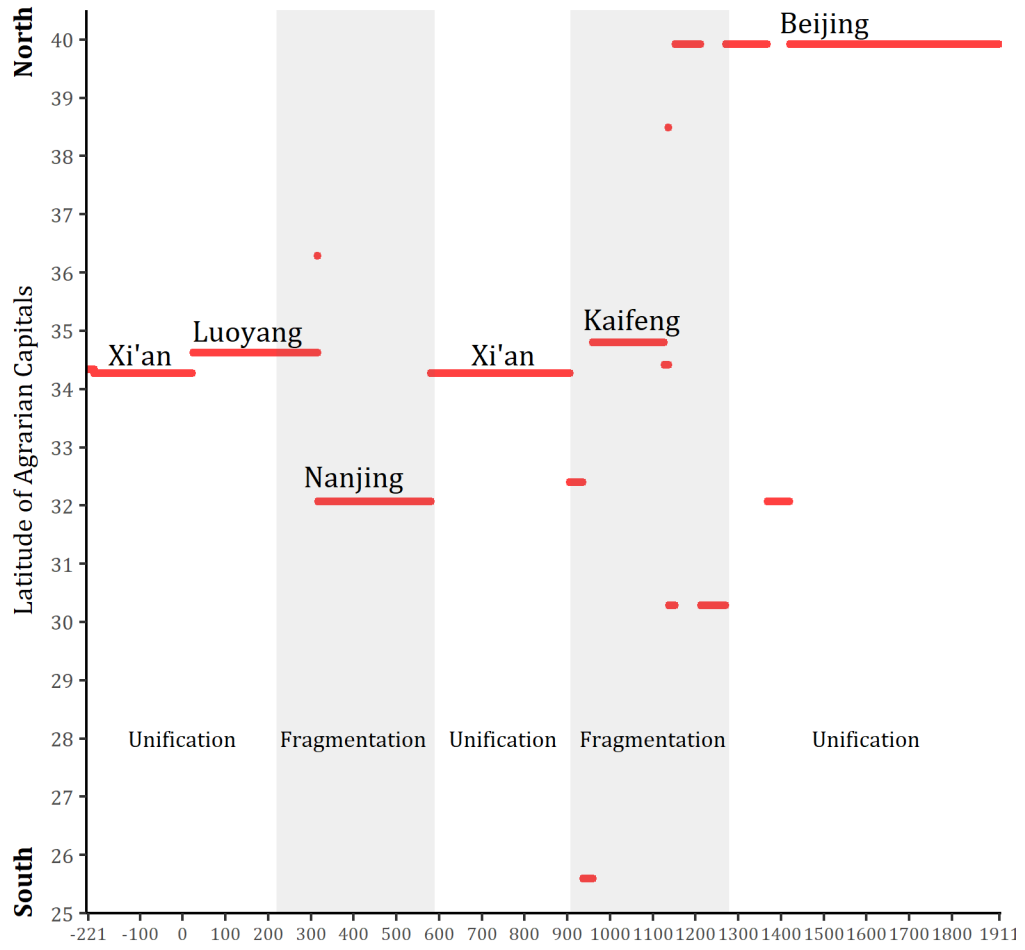
Military and administrative capacity developed in Northern China enabled Chinese conquest of China's south and southwest that had not seen comparable scale of state infrastructure. These conquests in turn reduced external threat to the agrarian empire at the same time allowed greater resource extractive capacity of the new regions.<sup>13</sup> Hence, despite the rising importance of Chinese territories south of the Yangzi river – most notably the Lower Yangzi, for example, which was to emerge as China's most prosperous economic regions in the second millennium - Northern China remained politically and militarily dominant. Peter Turchin noted that all but one of the fifteen unifications that occurred in Chinese history – with the exception of the establishment of the Ming c. 1368 – originated in the North.<sup>14</sup> Our narrative corroborate the recent study by Fernandes et al 2023 on the strategic importance of Northern Chinese plain as unifying force of China.

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<sup>13</sup> As Ge (2008) pointed out that in order to attack the nomadic forces in Northern China, the aggressive Hanwu emperor conquered the local tribes of China's Southwest territory of Western Sichuan Plateau and Yun-Gui Highlands around 112 BC and then further annexed two tribes in Dian and Kunmin (in current Yunnan province) and established the administrative prefecture of Yizhou (益州郡) in 109 BC. Like many of the Chinese conquests, these annexations provided stability to the Chinese rulers and generated potential new economic resources to focus on dealing with the Nomadic threats.

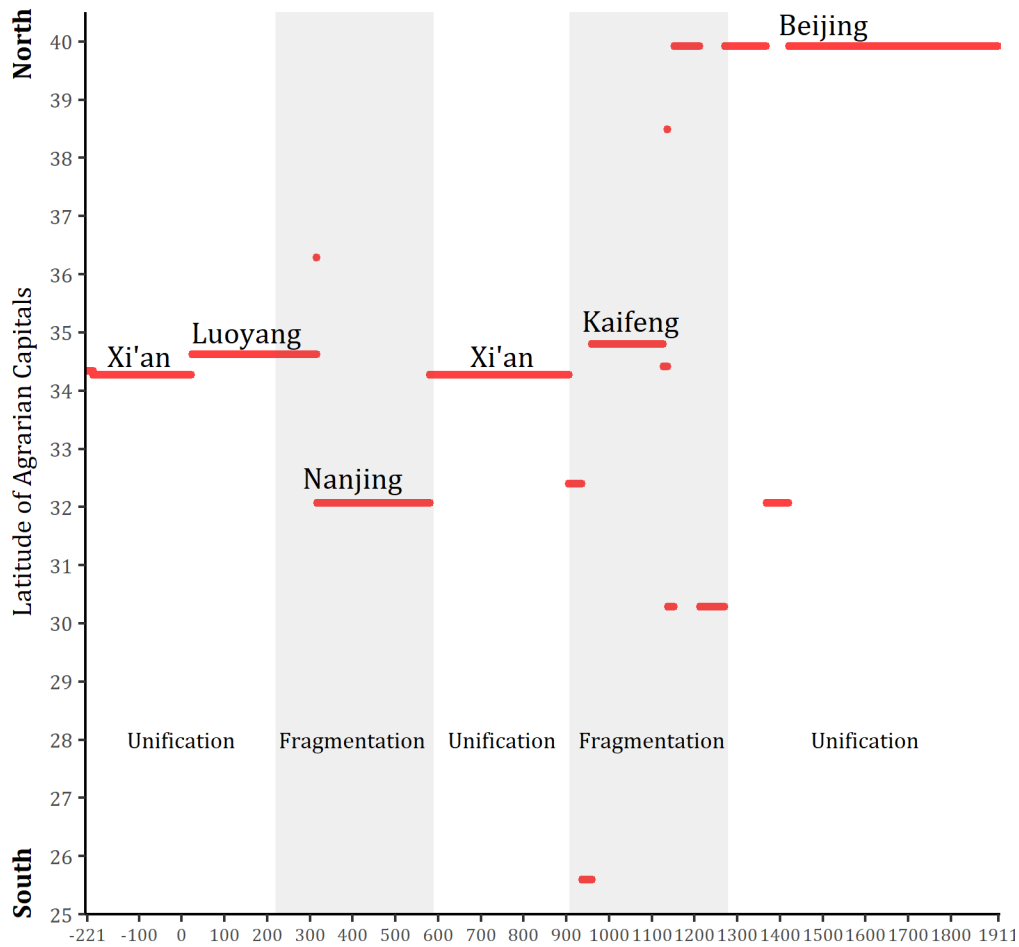
<sup>14</sup> Three began from the north-east (the Liao peninsula, Manchuria), three from the north central region (Yellow River), and eight from the north-west. See Turchin p. 192. Fernandez-Villaverde et al 2023 develops theoretical models supported by mathematical simulations to demonstrate the critical importance of China's highly productive Northern Chinese plain as the core region.

**Figure 5. The Eastward drift of Agrarian Capitals**





**Figure 6. The Northward Drift of Agrarian Capitals**



Using our database, Figures 5 and 6 provide a comprehensive validation of these observations on the duration and frequency of Chinese agrarian imperial capitals. Our database reveals the top three agrarian capitals with the longest duration are Beijing, Xi'an and Nanjing, the first of the three all in Northern China. But if we use the number of regimes that had chosen as capital, Nanjing came out on top, followed by Xi'an, Luoyang and Kaifeng all three of which had three regimes each. Nanjing which had been the capital of Wu in the Three-Kingdom era and briefly of the Ming dynasty (1368-1644), an explicitly Han Chinese dynasty that rebelled against and defeated the Mongol Yuan dynasty had been the only capital in the South. However, the Ming capital moved back to Beijing from 1421, the originally Yuan dynasty capital in order to shore up defence against the nomadic threats from outside the Great Wall. Indeed, except for this

brief interlude, no other agrarian regime had ever had a capital in the south of the Yangzi River across the phases of unification. Both figures 5 and 6 reveal clear eastward and northward drift of Chinese imperial capitals overtime reflecting precisely the geographic extension of Chinese political center following the development of agricultural base and transport links to counter the rising scale of nomadic-agrarian conflict.

China's steppes territory outside the Great Wall is a vastly different geographic environment inhospitable to agrarian based absolutist institutions founded on the ideology of Confucius-legalist synthesis. Nomadic and semi-nomadic societies on the steppes frontier are highly mobile and tribal with relatively little infrastructure or fixed investment. As Turchin pointed out, the political organization of pastoral nomads on a large scale requires a nearby settled society, because the nomadic society does not produce surplus in a form useable or taxable to support the state as their chief product – livestock – cannot be stored easily, unlike the grain produced by agrarian economies. Despite being fewer in number, the nomadic population derived a comparative advantage in violence from their mobility and the availability of horses. In particular, mounted archery on horses with stirrups invented and practiced from the beginning of the first millennium BCE turned them into formidable opponent to sedentary agriculture society south of the Wall (Li 2018). Often, nomadic empires rise and fall as a matter of response to warfare with the agrarian Chinese empire. But when the empire collapses, the nomadic frontier could quickly revert to anarchy ruled by autonomous tribal organization (Barfield, p. 8).

Our database on the geographic location of nomadic imperial capitals confirm far less stability in both their duration and frequency than those of the agrarian imperial capitals. The total of 41 agrarian regime capitals has an average duration of about 136 years with a standard deviation 175 years while the total of 27 nomadic capitals has an average duration of about 99 years with a standard deviation 66 years.

### **3.3 The Chinese-Barbarian Synthesis**

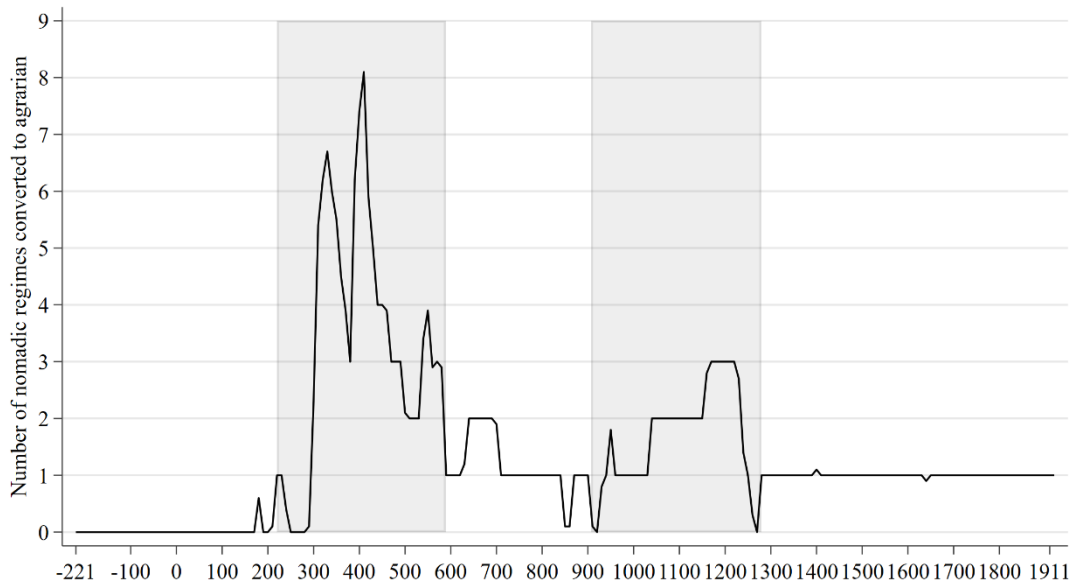
Scholars have long noted the importance of agrarian-nomadic conflict as both a critical threat and impetus to Chinese unification as witnessed by a progressive escalation in the scale of warfare and the size of political units mobilized for warfare between the two types of regimes on two sides of the Great Wall. (Lattimore 1988; Barfield 1989; Turchin 2009; Bai and Kung 2011). For example, the rising scale of military build-up in agrarian China made by the construction of Grand Canal, were only matched by the scaling-up of imperial confederations of nomadic and semi-nomadic tribes. Indeed, Turchin (2009) noted a striking degree of synchrony and feedback loop between the rise of the steppe imperial confederations and Chinese empires – Xiongnu and Qin/Han, Turks and Sui/Tang, Mongols and Song (p.194).

The importance of nomadic origin of many Chinese rulers can be re-examined by the database from Figure 4. Among the 134 regimes in total, there are 92 agrarian regimes and 42 nomadic regimes based on the criterion of the geographic location of regime capital north or south of the Great Wall. But actually among the 92 agrarian regimes, thirty-three of them were originally nomadic rulers who migrated to the south of the Great Wall.<sup>15</sup> We can illustrate the disproportionate impact of the nomadic rulers by classifying the imperial rulers by the ethnicity of the rulers rather than the location of the capitals. Figure 7 shows the number of nomadic regimes that crossed the Great Wall to rule in agrarian China. It reveals the two major waves of nomadic (Barbarian) rulers into China during the two phases of fragmentation. With an interlude of the Han Chinese Ming dynasty (1368-1644), the mighty Mongol (1280-1368) and Manchus (1644-1911) have realized the Grand Unity with the greatest size through a Chinese-Barbarian thesis. All these go to show the military advantage of the nomadic tribal societies derived from the strategic use of horses in the steppes environment that could exert disproportionately large impact on state formation and political institutions in China despite much smaller population.

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<sup>15</sup> Indeed, among the fifteen Chinese dynasties listed by Turchin (2009), about half of the rulers are of non-Han origin. See p. 193.

**Figure 7: The Number of Nomadic (Barbarian) Regimes (Converted) to Agrarian Regimes in 221BC - 1911**

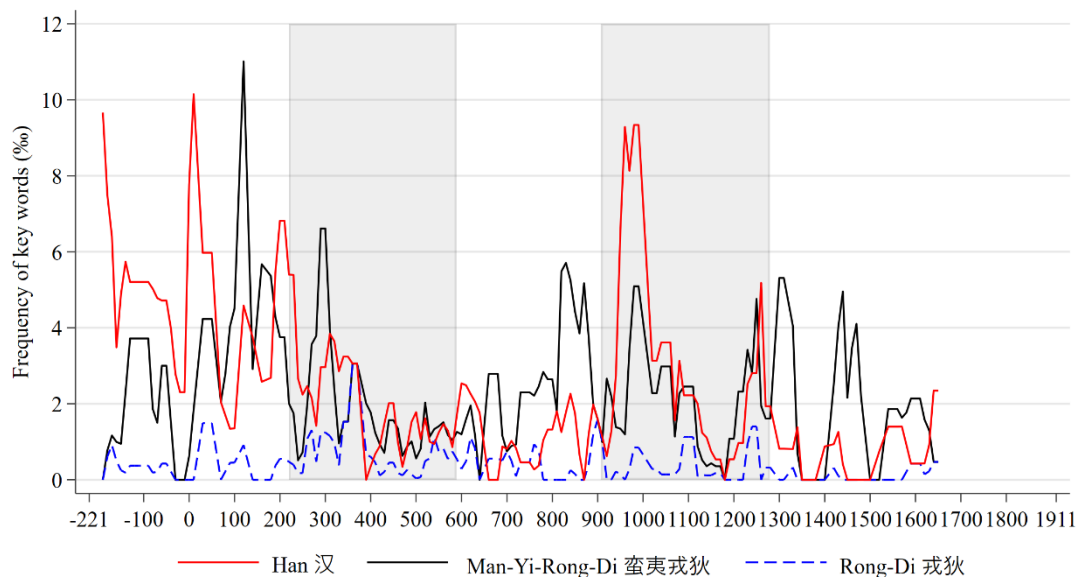


The inability of the agrarian regime of production and rule to spread to or control the nomadic frontier becomes a perennial challenge to the very concept of monopoly rule for all under the heaven in the Chinese system. Hence, Chinese nomadic frontier remained in the collective historical memory as forever the “external”, “the outsider” or more aptly in the Chinese lexicon “the barbarian” (夷). To certain degree, China’s Grand Unity and internal cohesion are forged by the ideological construction or reconstruction of a shifting perennial external (barbarian) threat. In Figure 8, we illustrate the durability of this binary category concept through two millennia textual extraction of the terms Han 汉 versus Barbarian (the four types) from the Twenty Four Historical Annals. Again, it shows the remarkable centrality in the Chinese ruling consciousness.

Despite the superior military advantage, all nomadic regimes had to confront the problem of legitimacy ruling over the vast majority of Han Chinese inculcated in a Confucius ideology that advocated the cultural superiority of Han Chinese over the Barbarians. Historically, this problem was overcome often through a nomadic assimilation to Chinese culture and institutions especially during the first phase of fragmentation as seen in Figures 7. The most famous case of cultural conversion is that of Emperor Xiaowen of Northern Wei (471-499) in

Northern Wei dynasty who instructed his Xianbei ethnic ruling elites to adopt Chinese customs and norms or even intermarry with Chinese (Zhao 2016, p.315). The sense of Han Chinese cultural superiority or orthodoxy sustained during the second phase of fragmentation as shown in Figures 4 and 8. Song China, despite her shrinking territory and military defeats, maintained high mark of legitimacy over other powerful minority ruling regimes of Liao, Jin and Mongols in Northern China.

**Figure 8: Word Frequency (Percentage Share) of the Chinese character “Han” 汉 (Chinese) versus “Barbarian” (divided into sum of 'Man-Yi-Rong-Di' 蛮夷戎狄 and 'Rong-Di' 戎狄) in 221BC - 1644**



**Notes:** Same as for figure 2 except for the words extracted are Han and four terms related to the meaning of “barbarian”.

The eventual Mongol conquest of the whole China marked a decisive shift in the Chinese/barbarian balance. Being the world’s Eurasian global empire, the Mongol dynasty initially ruled China with high-handed nomadic governance structure and retained its identity as a Central Asian Khan. But eventually like previous nomadic regimes, it was Chinese Confucian elites who persuade the Mongolian rulers to adopt Chinese ruling ideology and also selected the term “Yuan” from the ancient Chinese classics of Yijin 易经 to denote the Mongol dynasty. The character Yuan - which meant “origin” or “beginning” in Chinese – signified a new

beginning or origin in that it was the first time that the names of a ruling dynasty no longer followed the tradition of naming after the kingdoms of the ancient Zhou dynasty (Danjo 2016, p. 179).

The problem of legitimacy had once again confronted Qing, China's last dynasty ruled by a semi-nomadic minority groups hailed from Northeastern China. Although Qing was far more adept at adopting Chinese ideology and institutions, it also vastly expanded Chinese territory far beyond the Great Wall and it succeeded by constructing a multi-ethnic empire through the construction of four different identities to legitimize its rule: a traditional Chinese emperor for the vast major of Han Chinese, the Khan for the Manchuria and Mongol regions, the protectorates of the Tibetan Buddhism and Xinjiang Uygur Muslim<sup>16</sup>

Nonetheless, the ethnic origin of Qing's rule in China faced real challenge from Han Chinese elites. In one of the most well-known debates recorded with an imprisoned anti-Manchu Chinese rebel, Qing's enigmatic Yongzheng emperor (1722-1735) reprimanded his prisoner's failure to recognize that the distinction between Chinese and barbarians had always been shifting over time and even China's legendary rulers of Sheng and the King Wen of Zhou – viewed as the founding sages of Chinese civilization - could be considered as Eastern and Western barbarians given much smaller and limited core geographic region of China at the time. Indeed, what was then the Middle Yangzi region had also been barbarian territories in ancient China. Hence, the Northeaster geographic origin of the Qing rulers cannot be the reason that the Manchus had to be classified as barbarians. On the contrary, compared with previous ruling dynasties, Qing's capacity to incorporate vast border regions into a single unified rule and created possibly the largest Chinese empire in history should be viewed as the greatest blessing for the Chinese people (Danjo 2016, pp. 239-241).

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<sup>16</sup> Danjo 2016, p.242. The Mongol conquest of China as argued by Barfield (1989) was actually an exception. For an interesting comparison on the differences in the degrees of centralization of Mongol and Manchu political organization, see Yin (2020).

The most notable of Yongzheng's argument is that he used the size or the enormity of the Qing as a new element of legitimacy to the ideology of Grand Unity. This reconfiguration of the official Chinese ideology on Chinese/Barbarian synthesis was followed up by a massive censorship on any Chinese allusion of Qing as barbarian in any publications. This culminated the compilation and publication of the Siku Quanshu 四库全书 under the succeeding Qianlong reign which collected all the works up-to-date purged of any sensitive anti-Qing materials (Danjo 2016 pp. 238-242).

The success of the Qing reconstruction of legitimacy can be seen through the case of late Qing Taiping Rebellion (1850-1864). The Anti-Manchu Taiping Rebellion was initially launched from the Southwestern province of Guangxi in 1850 by a rebel leader, Hong Xiuquan, whose dream of joining the Qing elite came to tatters after failing the Civil Service Exams four times. The rebellion spread northward into China's rich hinterland provinces along the Yangzi river, inflicting massive human disasters and rendered the Qing rulers in Beijing completely powerless. Then, it was local militia men raised by the powerful Han Chinese bureaucrats headed by a native of the mid-Yangzi province of Hunan, Zeng Guofan, who came to Qing's rescue against another Han Chinese rebellion. Zeng earned his political elite status in the Qing empire through his success in passing brutal rounds of Civil Service Exams. He raised the so-called Hunan army based on his native networks and fiscal resources to eventually suppress the once unstoppable Taiping Rebellions (Bai, Jia and Yang 2021, Luo 1939). By then, the Hunan army, loyal only to Zeng could rival or overwhelm any military power including that of the Qing rulers. Remarkably, Zeng disbanded his Hunan army merely a few months after the capture of Taiping capital of Nanjing in 1864, thus dispelling any potential distrust from the Qing court. A devout Confucian bureaucrat, Zeng placed his faith in legitimacy of a single imperial ruler – albeit of Manchu ethnicity - and went on to become the most powerful Han Chinese bureaucrats in the post-Taiping era to engineer the so-called Self-strengthening movement within a traditional imperial ideology to counter the rise of another Barbarians: the Westerners (Wright 1957).

#### 4. Wars

We now turn to our second data set on incidences of warfare largely culled from the two-volume works compiled by China's Military History Committee.<sup>17</sup> For our purpose, we classify our total warfare data into three types.<sup>18</sup> The first and most important kind is warfare fought between nomadic and agrarian regimes (as defined by their respective capitals north or south of the Great Wall). We define the second type of warfare as "Civil War" fought between agrarian regimes (with their capitals located both within the Great Wall) – the proto-example would again be the Three-Kingdom era. We define the third type of warfare as "Rebellion" that were fought between local insurgents (without or before the establishment of any formal imperial capitals) against an established dynastic regime with capital. In this sense, Rebellion as distinguished from Civil War is being relatively more disorganized violence.<sup>19</sup> For example, that we classify Taiping rebels' warfare with the Qing government (1850-1864) before their founding of capital in Nanjing in 1853 as Rebellions but as Civil Wars after. Figure 9 plots the entire time series of these three types of warfare. For a total of 2471 incidences of warfare, we find 990, 789 and 692 incidences of Agrarian-Nomadic, Civil Wars and Rebellion respectively. Figure 10 plots the century average of the three types of warfare in percentage shares.<sup>20</sup>

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<sup>17</sup> According to the brief introductory notes, the two-volume works are largely based on the laborious team project that compiled incidences of warfare mostly from the twenty-four historical annals with some additional sources. Although brief narrative was provided for each incidence of warfare recorded, the records do not capture the scale, duration or intensity of each incidence of warfare. Nonetheless, we believe it is very useful information to give broad quantitative indication of the historical narrative or at least the official or prevailing perceptions of the magnitude of warfare in Chinese history. For a cross-check on the validity of this data source against another independent work for the Qing dynasty (1644-1911), see Bai and Kung (2011).

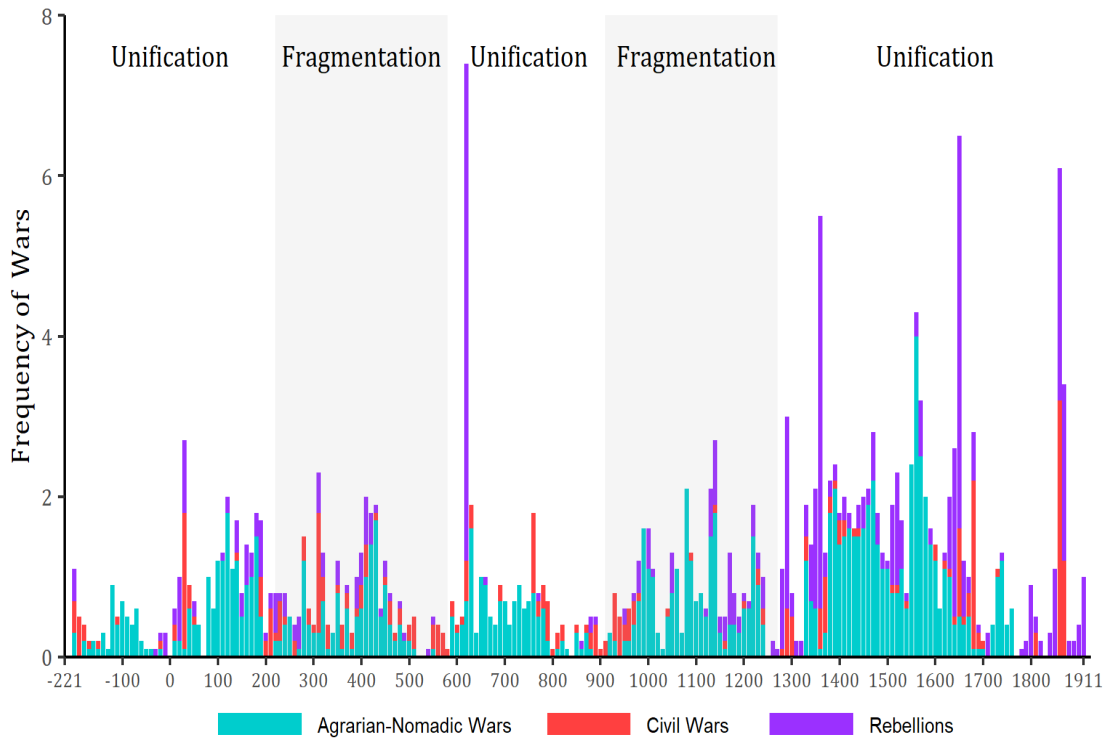
<sup>18</sup> We exclude Chinese warfare with Western powers from the mid-19<sup>th</sup> century onward, an issue we will discuss in the conclusion.

<sup>19</sup> This type of warfare is often classified - but mistakenly - as "peasant rebellion" in the Marxist scholarship. For rebellion, we drop warfare data where an insurgency was launched by nomadic or non-Han ethnic groups (without a nomadic imperial capital) against an agrarian regime. They amount to around 12% of incidences of our rebellion warfare.

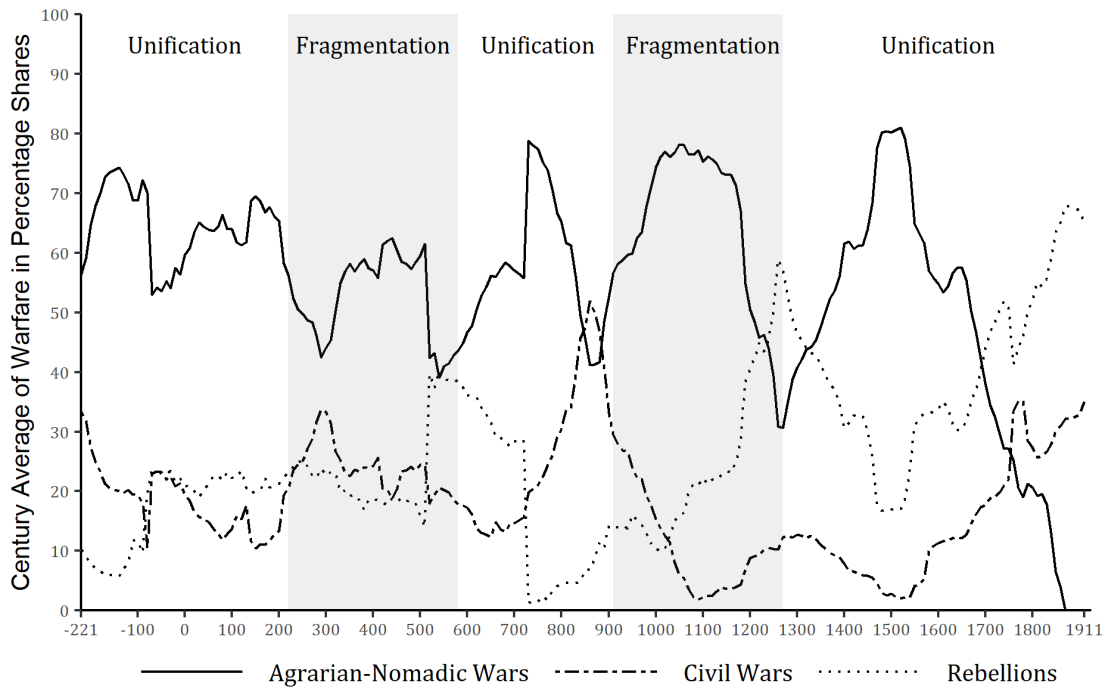
<sup>20</sup> Our incidences of warfare more specifically refer to the number of battles even though we use terms such as warfare. As all these warfare were largely compiled from official Chinese records by the agrarian regimes, there are naturally concerns of sample selection biases. While not completely alleviating these biases, we did some cross-checks with the data compiled by Bai and Kung (2011) and find that we are consistent. For the Qing period, we also cross-checked our agrarian-nomadic warfare data with the "Sino-Manchurian-



**Figure 9. Warfare by Types across Time**



**Figure 10. Warfare by Types across Time (Percentage)**

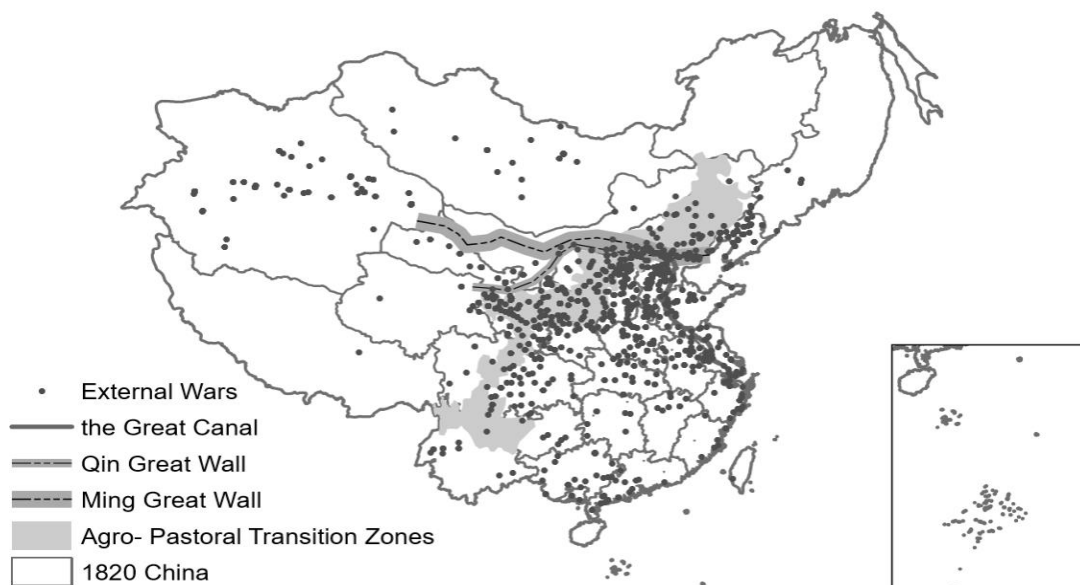


Mongolian wars" compiled by Peter Perude (2005) and found a 95% match.

The first salient feature in Figures 9 and 10 is the dominant share of agrarian-nomadic warfare in the total warfare. It is clear that Agrarian-Nomadic Warfare remained at a stable and high level throughout, averaging about 60% of the total warfare. Agrarian-Nomadic warfare took a very high ratio of 69% in the second phase of fragmentation (shaded area) largely because most of these warfares took place in the Norther Song (960-1127) which saw sustained organized violence between relatively several large states. Indeed, out of the 222 incidences of Agrarian-Nomadic warfare, 108 of them occurred in the Northern Song period. The ratio of Agrarian-Nomadic warfare reached 79% in the Northern Song according to our database.

In Figure 11, we show the geographic distribution of Agrarian-Nomadic Warfare that reveals the disproportionate concentration in the so-called Agrarian-Nomadic transition zone, the Semi-arid and semi-wet area of Hetao area of Huang River, Northern Shanxi and Beijing. Our database reveals the geographic importance of the inter-transition zone as the space for Agrarian-Nomadic War. Over 34% or 47% of total Agrarian-Nomadic warfare happened either within the zone or within fifty kilometers of the zone respectively, compared with 14 or 27% respectively for the Civil Wars and 12 or 25% for the Rebellions respectively. All these highlight the geo-significance of agrarian-nomadic conflict in Chinese history.

**Figure 11. Geographic Distribution of Agrarian-Nomadic Wars**



**Note:** Agrarian pastoral transition zone based on the study by Man (2009). The Agro-pastoral Transition zones is defined the average yearly rainfall of 400mm.

The other striking feature in Figure 9 is that the pattern of the incidences of rebellions displayed episodic periods of sudden upsurge. For example, there were as many 6.2 incidences per year during the decade of AD 620s and they averaged about five per year during the decade of 1260s, 1550s and 1850s. On the other hand, incidences of rebellion remained relatively low during periods of unity, averaging 0.32 incidences per year. These episodic upsurges capture the occasionally extremely violent and anarchic nature of sudden crisis or collapse of unitary states, often leading to massive losses of human sacrifices or dynastic changes. The highly destructive and un-predicable nature of these rebellions may have inclined China a strong preference towards unity and stability and high tolerance for the associated costs of repression and control (Jin and Liu p. 132-144).

Figure 10 also shows that the peak and trough of Agrarian-nomadic warfare seem to correlate negatively with those of the Civil Wars and Rebellions, indicating cyclic shifts between the external (agrarian versus nomadic) and internal (agrarian versus agrarian) warfare particularly from the 10<sup>th</sup> century onward. Not surprisingly, the ratio of Agrarian-Nomadic warfare in the final phase of unification were relatively low precisely because the two mighty nomadic regimes of Yuan and Qing dynasties prevailed as agrarian rulers over more or less the entire territory. Similarly, there was secular decline in the level of Civil Wars replaced by a secular increase of Rebellions overtime from the tenth century onward when China became increasingly unified. Chinese unity under a single regime changed the types of warfare increasingly away from more organized inter-state based civil war towards internal rebellion. Overall, the incidences of Civil Wars far exceeded those of Rebellions in phases of fragmentation than in unification. For example, there were 0.21 incidences of Civil Warfare per year in the first phase of fragmentation compared with 0.13 in the first phase of unification. The fragmenting civil wars among the agrarian regimes – even fading after the 10<sup>th</sup> century - had been an important feature of the Chinese empire. Indeed, there is no inevitability of a single unified state within the Chinese civilizations at least before the 10<sup>th</sup> century.<sup>21</sup>

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<sup>21</sup> See Chi (1963)'s insightful study on relatively independent geographic regions and economic regions

## 5. Empirical Test

### 5.1 The ARDL Model

From the above historical narrative and statistical series, we are able to generate an important testable hypothesis: agrarian-nomadic warfare would reduce the number of agrarian regimes and correspondingly increase the average size of their ruling agrarian territories but having no clear effects on the number of nomadic regimes controlling for other factors. For our econometric test, we apply an Auto-regressive Distributed Lag (ARDL) to capture several important features of nomadic and agrarian warfare. Given the nomadic regime's dependence on pasture which are highly susceptible to seasonal shocks usually in autumn and winter, nomadic-agrarian warfare often exhibit cyclic trends which will not fully capture the long-term impact of warfare and give rise low efficiency in estimation in an Autoregressive model (Pesaran et al. 2001). The application of ARDL overcomes these biases inherent in a simple AR model (Cho et al. 2021). Finally, although warfare aimed at overcoming fragmentation can lead to unification, the attempts to unify or to maintain unity by force could also exacerbate warfare (Mark et al. 2011). In the presence of such weak endogeneity, estimation on long-term effects between war and states using ARDL model is more suitable (Dufour and Kiviet 1998). As the number of regimes, territorial sizes and frequencies of warfare exhibit correlation with feedback loops and also high persistence overtime, we thereby apply the Autoregressive Distributed Lag (ARDL) approach, which posit sufficient numbers of lags to capture this data generating process within a general-to-specific modeling framework and do not rely on strict exogeneity conditions. We posit the following dynamics relationship in the estimation equation:

$$y_t = \beta_0 + \sum_{i=1}^p \beta_{1,i} y_{t-i} + \sum_{i=0}^q \beta_{2,i} w_{t-i} + \sum_{i=0}^j \beta_{3,i} w'_{t-i} + X_t' \gamma + \varepsilon_t \quad (1)$$

Here,  $t$  denotes decade,  $y$  is dependent variable which includes size of regime ( $y_1$ ) and

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that were prone to setting up autonomous or independent political regimes, p. 30-34.

number of agrarian regimes ( $y_2$ ).  $w$  is the key variable of our interest: incidences of Agrarian-nomadic wars. Vector  $W$  includes the two other types of wars: civil wars and rebellions.  $p$ ,  $q$  and  $J$  are lag orders for  $y$ ,  $w$  and  $W$  respectively.<sup>22</sup> For the control variables, we have the exogenous climate data, denoted as vector  $X$ , that include the current and lag effects of extreme weather.  $\varepsilon_t$  is the normally distributed and serially uncorrelated disturbance term.

Although possible to estimate empirically, Equation (1) is difficult to interpret intuitively due to the existence of lags in the variables on the right hand of the equation. For that, we apply the Error Correction Models (ECM thereafter) which is a linear transformation of Equation (1) that integrates the short-run dynamics with the long-run equilibrium, without losing long-run information. In Equation (2), we use the error correcting transformation to estimate long-run and short-run effects of warfare in a single equation:<sup>23</sup>

$$\Delta y_t = \sum_{i=1}^{p-1} \theta_{1,i} \Delta y_{t-i} + \sum_{i=1}^{q-1} \theta_{2,i} \Delta w_{t-i} + \sum_{i=1}^{J-1} \theta_{3,i}' \Delta W_{t-i} + \delta * ECT_{t-1} + X' \gamma_2 + \varepsilon_t \quad (2)$$

where  $\Delta y_t$ ,  $\Delta w_{t-i}$  and  $\Delta W_{t-i}$  denote first-differenced variables for  $y$ ,  $w$  and  $W$  respectively and  $\theta_{1,i}$ ,  $\theta_{2,i}$  and  $\theta_{3,i}$  are their short run coefficients.  $ECT_{t-1}$  is the one period lag residual of long-run equilibrium Error Correction Term (ECT):

$$ECT_t = y_t - c - \alpha_2 w_t - \alpha_3' W_t \quad (3)$$

This correction term captures deviation of the system ( $y_t$ ,  $w_t$ ,  $W_t$ ), from a hypothesized long-run equilibrium between variables such as wars and number and size of states as specified in  $y = c + \alpha_2 w + \alpha_3' W$ . And  $\alpha_2$  and  $\alpha_3$  measure long-run effects of warfare on size of agrarian states and indicates how dependent variable permanently change due to one unit of change in the independent variables. Our baseline regressions will rely on equations (2) and

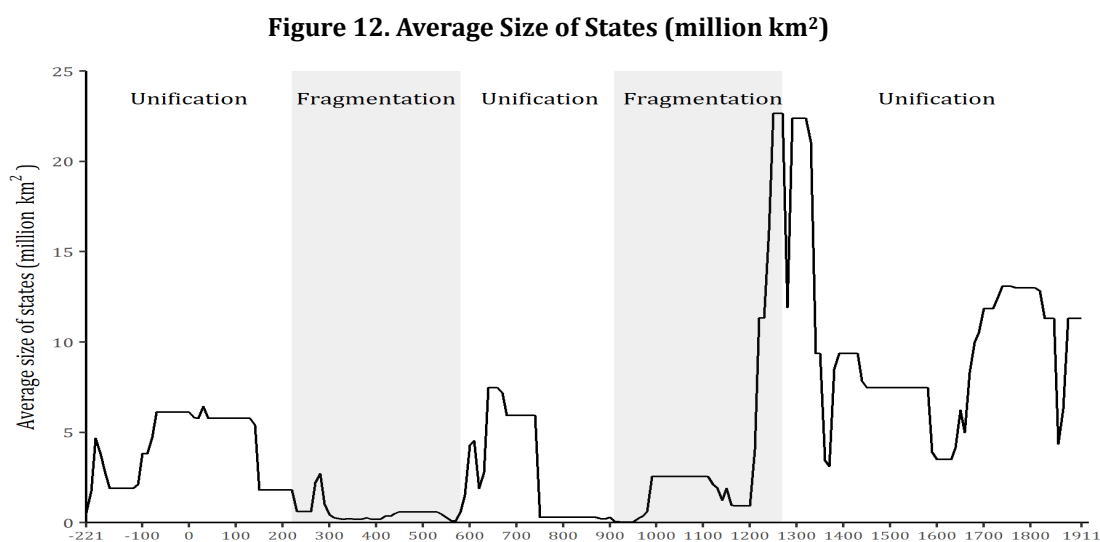
<sup>22</sup> Lag order  $J$  is a vector since  $W$  includes two control variables.

<sup>23</sup> Furthermore, ECM can be used to conduct conventional Granger non-causality tests (Granger et al. 2000; Morley 2006), and therefore offers us additional examination on the causality from warfare to size of nations.

(3) with our main variables of interest in the long-term effects as captured by  $\alpha_2$  and  $\alpha_3$ . We also report the coefficients on short-term effects for  $\theta_{1,i}$ ,  $\theta_{2,i}$  and  $\theta_{3,i}$ . Specifically, coefficient  $\delta$  represents the rate of adjustment to the path of long run equilibrium which is expected to range between 0 and -1.

## 5.2 Descriptive Statistics

For our empirical exercise, we put together decadal series of data for the period of 221 BC – 1911 AD. We have two interrelated but not overlapping dependent variables. The number of political regimes as measured by the number of agrarian and nomadic capitals as shown in Figure 4. Our second variable is the average territorial size of political regimes within a year based on the GIS measure of the landmark *China Historical Atlas* compiled by Tan (1996). In the case of more than one regime at a time, we use their averages. Obviously, there is a statistically significant inverse relationship between these two dependent variables a correlation coefficient of -0.474 (significant at 1% level). Figure 12 gives a plot of the number of agrarian regimes and the average territorial size alongside the frequency of agrarian-nomadic warfare.<sup>24</sup>



24. Figure 9 shows a huge spike during the 13th century due to the Mongolia Yuan dynasty that greatly exceeded even Qing's territory in 1820. The use of Yuan territory instead of the Qing 1820 territory do not affect our statistical results.

We test the two dependent variables of the number and territorial sizes of political regimes against the core independent variable of Agrarian-nomadic warfare alongside a set of weather and natural disaster control variables (Wittfogel 1957; Zhang et al. 2008; Burke et al. 2009; Burke et al. 2015; Buckley et al. 2010; Bai and Kung 2011; Hsiang et al. 2013; Hsiang and Meng 2014). Given the shifting relationships among the three types of warfares in Figure 10, we also control for Civil Wars and Rebellions. Table 1 provides descriptive statistics of these variables.

**Table 1. Summary Statistics**

	Variables	Obs	Mean	SD	Source
y <sub>1</sub>	Size of agrarian regime	214	814.732	514.193	A
y <sub>2</sub>	Number of agrarian regimes	214	0.963	0.442	B C D
w <sub>1</sub>	Agrarian-nomadic wars	214	0.463	0.491	F
w <sub>2</sub>	Civil wars	214	0.139	0.265	F
w <sub>3</sub>	Rebellions	214	0.321	0.828	F
x <sub>1</sub>	High temperature	214	0.178	0.383	G
x <sub>2</sub>	Serious locust plague	214	0.127	0.333	G
x <sub>3</sub>	Heavy floods	214	0.145	0.353	G
x <sub>4</sub>	Heavy droughts	214	0.154	0.362	G

**Note:** Specifically, we defined “extreme weather” (e.g. High temperature, Serious locust plague, Heavy floods and Heavy droughts) as the value of a certain weather in a given decade exceeding the mean value of the weather variable by one or more standard deviation. This ensures that the share of extreme periods is smaller enough relative to the whole sample period.

**Source:** A. Tan (1996); B. Shen (1998) C. Bai and Chen (1997); E. Military History of China Writing (2003); G. Wang (1992)

### 5.3 Wars and States

We conduct our empirical exercises in three steps. First, we perform a unit-root test to determine the order of integration of each variable, and to see whether any variable would require first or higher order differencing. We then proceed with a bounds test to confirm the existence of a long-run equilibrium relationship between warfare and size of nation; Once confirmed, we go on to the estimation of ECM to determine the long and short-run effects of Agrarian-nomadic wars on size of nations. We conduct three different unit-root tests to determine the number of orders: Augmented Dickey-Fuller Test (ADF), Phillips-Perron Test

(PP) and Elliot-Rothenberg-Stock Dickey-Fuller GSL Detrended Test (DF-GLS). All our variables pass the first two steps of our diagnostic tests, which were presented in the Appendix 2. Here, we focus on reporting the main results of our ARDL test.

Table 2 presents the baseline results on the short and long-term impact of agrarian-nomadic wars on the two outcomes variables: size and number of agrarian regimes. Panel A in Table 2 reports the long-term coefficients for “Agrarian-nomadic warfare” (as  $\alpha_2$  in equation 3) and for “Civil Wars” and “Rebellions” (as  $\alpha_3$ ). Panel B reports the short-run coefficients with  $\delta$ ,  $\theta_{1,i}$ , and  $\theta_{3,i}$  in equation 2 as coefficients for  $ECT_{t-1}$  lag order of one through three for variables of  $\Delta y_t$  and “Rebellions” only. We did not include variables and report coefficients  $\theta_{2,i}$  for “Agrarian-nomadic wars” and “Civil wars” in our regression as they are not significant in terms of short-run effects based on AIC criteria. As expected, the long-run coefficient of agrarian-nomadic wars on size and number of agrarian regimes in Panel A is 596.6 and 0.6 (both statistically significant at 5% level). Intuitively, each additional incidence of agrarian-nomadic warfare in a decade will lead to a long-term increase of territorial size of 596.6 square kilometers for the agrarian regime and a long-term reduction of 0.6 number of agrarian regimes. Panel A also shows that the other two types of warfare exert no significant long-run effects on the two outcome variables. Turning now to the short-run coefficients, we find a significant statistics of -0.11 on ECT, indicating a speed of convergence back to equilibrium size of states and number of agrarian regimes of 9.09(=1/0.110) and 8.93(=1/0.112) respectively. Given the decadal frequency our data series, this translates into an average speed of convergence of 91 and 89 years respectively.



**Table 2. Baseline Model: Agrarian-nomadic Wars and Size and Number of Agrarian Regimes**

	(1)	(2)
$y_t$	Size of Agrarian Regimes	Number of Agrarian Regimes
<b>Panel A: Long-run coefficients</b>		
Dependent variable: $y_t$		
Agrarian-nomadic wars $\alpha_2$	596.60** (293.11)	-0.60** (0.28)
Civil wars $\alpha_{3-1}$	762.6 (509.8)	0.63 (0.43)
Rebellions $\alpha_{3-2}$	391.1 (240.6)	-0.12 (0.21)
<b>Panel B: Short-run coefficients</b>		
Dependent variable: $\Delta y_t$		
$ECT_{t-1} \delta$	-0.11*** (0.03)	-0.11*** (0.03)
LD. $\Delta y_t \theta_{11}$	-0.05 (0.07)	0.19*** (0.07)
L2D. $\Delta y_t \theta_{12}$	0.11* (0.07)	
L3D. $\Delta y_t \theta_{13}$	0.14** (0.07)	
D. Rebellion $\theta_{31}$	-86.96*** (20.27)	0.09*** (0.02)
LD. Rebellion $\theta_{32}$	-76.50*** (16.51)	0.06*** (0.02)
Constant	-22.42 (27.09)	0.15*** (0.04)
Control for extreme weather	YES	YES
Time trend	YES	YES
Adj. R <sup>2</sup>	0.17	0.28
AIC	2782.30	-133.50
BIC	2832.50	-90.00
t-statistic on ECT	-3.54**	-3.80*
Optimal lag	[4,0,0,2]	[2,0,0,2]
N	210	210

**Notes:** Optimal lags are selected by the Akaike information criterion (AIC). T-statistic on ECT reports the result of Granger non-causality test on long-run causality, which tests the significance of the coefficient of the lagged ECT. Wald test reports the F statistic from a Wald test on the lagged differences of the Agrarian-nomadic wars. Standard errors in parentheses \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Based on AIC selection, the optimal lag orders are [4,0,0,2] and [2,0,0,2], so we reported the coefficients for lagged dependent variable and “Rebellions” only.

To sharpen our findings, we run an identical ADRL between the total number of warfare (by

summing the three types of warfare) on the two outcome variables along with the other identical controls in Table 2. We find the long-term coefficients are 433 and -0.16 for the size and number of agrarian regimes respectively with the first coefficient statistically significant at 5% level. Comparing these with the figure of 596 and -0.6 respectively for agrarian-nomadic warfare alone (both significant at 5% level) shows that it is the Agrarian-Nomadic warfare rather than all warfare that drives the pattern of state formation in China.

We further conduct a Granger-Causality test (Granger et al. 2000) and report *T*-statistic on the coefficient of the lagged ECT. The significant *t*-statistics on the lagged ECT in two models strongly suggests that the long-run causality is running from wars to the size and number of agrarian regimes rather than the other way around. The three statistics on the fitness of the model, adjusted R square, Akaike's Information Criterion (AIC) and Schwarz's Bayesian Information Criterion (BIC), are also reported in Table 2.<sup>25</sup>

To extend the result of our Granger-Causality test, we further conduct an IV approach to address the potential endogeneity of Agrarian-nomadic wars as we might worry about unobserved time-varying variables that correlate with both war and nation. We utilize an IV approach by instrumenting incidences of warfare by changes in temperature in Northern China based on works that show changing temperature would likely affect the incidences of Agrarian-nomadic wars (e.g. Bai and Kung 2011). It is well-known that nomadic tribes and economies are far more susceptible to perverse changes in climate and temperatures which often prompt nomadic incursion into agrarian regions to relieve potential subsistence crisis (Barth, 1964; Khazanov, 1994; Graff and Higham, 2002). We also argue that this IV satisfied

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<sup>25</sup> The sudden switch between agrarian and nomadic regimes following the relocation of capitals at certain years may give rise to endogeneity problem in variable selection. These occur during 317-598 AD, 1279-1368 AD and 1644-1839AD affecting about 28.44% of total sampled incidences of agrarian-nomadic warfare. There are a total 163 incidences of warfare, about 16.5% of agrarian-nomadic warfare in that category. We run a regression by excluding this 28.44% of this sample and confirm similar result to the overall sample.

the usual exclusion restrictions.<sup>26</sup>

Based on this, we construct the following IV estimate equation in the following two equations:

$$Y_t = \alpha + \beta_1 \widehat{War}_t + \gamma X_t' + \varepsilon_t \quad (4)$$

Where  $\widehat{War}_t$  was the estimated variable of agrarian-nomadic wars generated by the first-stage regression in the IV framework:

$$\widehat{War}_t = \alpha + \alpha_1 Northtemp_t + X_t' + \varepsilon_t \quad (5)$$

Here,  $Northtemp_t$  is the temperature deviation in Northern China from the National average. All other variables in  $Y_t$ ,  $X_t'$  and  $\varepsilon_t$  are the same as in the rest of the paper. The IV results are presented in Table 3, where Column (1) and (2) show the first-stage regression results on the correlation between IV and agrarian-nomadic wars. The first-stage results suggest that the IV is significantly negatively correlated with Agrarian-Nomadic Warfare. This confirms the validity of our first stage analysis showing a reduction in temperature would lead to higher incidences of agrarian-nomadic warfare. Columns (3) – (5) show the 2SLS results with different dependent variables that are the size of nation, the number of agrarian regimes and the number of nomadic regimes respectively. The results are consistent with the estimated outcome from ARDL model, namely, after controlling other wars and extreme weather, nomadic-agrarian warfare strengthens unification, increases the size of average territorial

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<sup>26</sup> The main exclusion restriction requires that the IV would only affect the dependent variables through the explanatory variables. The fact that temperature variation in Northern China would impact the number and size of states through warfare rather than through other channels should be intuitively clear. However, one could argue that temperature variation may affect agrarian development in Southern China which would in turn impact of the size of the states (Bai and Kung 2011). If so, IV would mistakenly allocate the impact of agrarian development in Southern China to warfare. We argue this is unlikely for two reasons. Firstly, while temperature variation in Northern China impacts directly on grazing pasture in nomadic regions, it had minimal impact on rice regions in southern China as cold temperature from the North were obstructed by Qinglin mountain range. Secondly, rice cultivation relied heavily on irrigation which became highly developed in the south of the Yangzi river and hence less affected by the cold temperature.

sizes and reduces and the number of agrarian regimes.

**Table 3: IV Estimates Results**

	First Stage		2SLS	
	(1)	(2)	(3)	(4)
	Agrarian-nomadic wars	Size of nation	Agrarian regimes	Nomadic Regimes
Agrarian-nomadic wars		1,315*** (435.3)	-0.595** (0.255)	-0.403 (0.352)
North temperature	-0.484*** (0.161)			
Civil wars	-0.243** (0.094)	161.8 (172.0)	0.194 (0.175)	0.188 (0.144)
Rebellions	-0.038 (0.036)	102.4* (59.35)	-0.0104 (0.039)	-0.173** (0.070)
High temperature	-0.202*** (0.066)	39.13 (120.2)	-0.153 (0.097)	0.0619 (0.100)
Serious locust plague	0.050 (0.154)	-40.32 (211.1)	-0.133 (0.105)	0.002 (0.140)
Heavy floods	-0.087 (0.088)	-22.19 (179.5)	0.121 (0.106)	0.232 (0.150)
Heavy droughts	-0.262*** (0.082)	969.6*** (161.5)	-0.303*** (0.103)	-0.829*** (0.155)
Constant	0.637*** (0.055)	-352.6 (265.0)	1.323*** (0.152)	1.603*** (0.219)
Observations	190	190	190	190
R-squared	0.133			0.091

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

While our empirical results confirm the expectation that agrarian-nomadic warfare lead to the expansion in the size of agrarian regimes and reduction in the number of agrarian regimes, no such effect may exist on the number of nomadic regimes as argued in our narrative. In Table 4, we confirm this with our finding that the long-run coefficient of agrarian-nomadic warfare on the number of nomadic regimes is statistically insignificant. This may also reflect the outcome that agrarian-nomadic warfare also led to the merging or conversion of nomadic regimes into an agrarian regime after their conquest and move of their capitals behind the Great Wall.

**Table 4. Agrarian-Nomadic Wars and Nomadic Regimes**

	(1)	(2)
$y_t$	Nomadic Regimes	Nomadic Regimes (with time trend)
<hr/> Panel A: Long-run coefficients <hr/>		
Dependent variable: $y_t$		
Agrarian-nomadic wars $\alpha_2$	-0.19 (0.36)	0.03 (0.28)
Civil wars $\alpha_{3-1}$	0.20 (0.65)	0.11 (0.49)
Peasant uprisings $\alpha_{3-2}$	-0.41* (0.22)	-0.23 (0.17)
<hr/> Panel B: Short-run coefficients <hr/>		
Dependent variable: $\Delta y_t$		
$ECT_{t-1} \delta$	-0.06*** (0.02)	-0.08*** (0.02)
LD. $\Delta y_t \theta_{11}$	0.32*** (0.07)	0.32*** (0.07)
Constant	0.09*** (0.03)	0.14*** (0.04)
Control for weather	YES	YES
Time trend	NO	YES
Adj. R <sup>2</sup>	0.10	0.11
AIC	-212.30	-214.50
BIC	-178.90	-177.70
t-statistic on ECT	-3.02**	-3.60**
Optimal lag	[2,0,0,0]	[2,0,0,0]
N	210	210

**Notes:** Optimal lags are selected by the Akaike information criterion (AIC). T-statistic on ECT reports the result

of Granger non-causality test on long-run causality, which tests the significance of the coefficient of the lagged ECT. Standard errors in parentheses \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

To test the effects of warfare separately across the differing phases of unification and fragmentation, we further split our samples and run separate regressions across different phases, we find that while agrarian nomadic warfare and internal rebellion enhance unification but civil war reinforce fragmentation in historical phases of fragmentation but not during unification. Our result is presented in Appendix 4. We also performed a direct ARDL test on the long-term relationship between the word frequency of “Tong” and warfare. Our econometric test does not reveal a long-term relationship but some significance in short-term coefficients. Given that the measure issues of using word frequency and our argument that ideology and warfare is more likely correlation than causation, we do not want to over-interpret the result but will be happy to supply the result upon request.

## **6. Conclusion: The Long-term Consequences of Chinese Unification**

Our research on Chinese state sheds new insights on the relationship between warfare and states in the European context. As summarized by Zhao, a polity could mobilize resource for warfare through financial capital, nationalism or pure coercion depending on her underlying political structures. Eventually, relatively capital rich states with weak despotic power would more likely resort to the first and second method, leading these states down towards a path of some form of constrained political regime, civil society and constitutionalism. For China, the Legalist reform implemented by Shang Yang endowed imperial China with massive coercive power to employ the third method that is coercion (Acemoglu and Robinson 2019, chapter 8). In this case, given that its effectiveness hinges far more on the state’s coercive power, warfare actually further strengthen state power at the expense of autonomous economic, ideological, or political actors (Zhao p. 199-200). In that regard, the durability of Chinese absolutism found some equivalence with Tilly’s characterization on the rise of coercion intensive European

states.<sup>27</sup> Thus, state capacity mobilized for external warfare were more likely turn into tools of domestic political repression in coercive states rather than serving as an impetus to the rise of common national interest in more constrained states as described in Besley and Perrson (2011). It is not a coincidence the heightened pace of agrarian nomadic warfare (and the corresponding reduction in the share of civil wars) from the tenth century in China corresponded to an increasing concentration of imperial power, the strengthening of imperial bureaucracy and the associated Civil Service Exam system and ultimately social control.<sup>28</sup>

Unification under a single emperor allowed China to change the nature of warfare from Civil War towards Internal Rebellion. Internal repression actually weakens state capacity as surveillance and propaganda were often far more effective than massive military build-up and resource mobilization (Ma and Rubin 2019). Hence, unification diminished the frequency of Civil Wars as well as the degree of inter-state competition and the dynamism of state building. In the end, when the ideology of one ruler for all under heaven became the source of legitimacy, this ideology itself gave rise to a peculiar Chinese form of political legitimacy that substituted cross-dynastic competition for inter-state competition.<sup>29</sup> This also meant that historically, Chinese political reform or changes had no alternative frame of reference or models except her own past to look up to (Ma 2012). Moreover, historical lessons on the rise and fall of Chinese dynasties served as mirrors to reflect on the legitimacy of the current and future imperial rulers. Indeed, the greatness and glories of the Chinese emperors throughout history would be measured by their records in “unification” whatever that may mean and however that may be achieved (Fairbank 1987).

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<sup>27</sup> Tilly’s point about coercion-intensive path of state building is confirmed by the rise of rural-based authoritative states such as Prussia and Russia in a new study by Karaman and Pamuk (2013).

<sup>28</sup> See Ma 2012 on the strengthening of Chinese imperial power from the Song dynasty onward. Dincecco and Wang 2018 (quoting Wang’s work) shows that the state repeatedly used rebellion threats as an opportunity to double down its coercive power. It argues that military garrisons during the Ming Dynasty (1368–1644) constructed for national defence were often turned into tools of domestic repression.

<sup>29</sup> For a recent exposition of multi-state competition acting as an “exit option”, see Dincecco and Wang (2018).

From a millennial perspective, Chinese unification may well be a mixed blessing as noted by Fairbank (1987). While unity preserved the continuity of Chinese civilization and forged the world's single largest economy during the early modern era, it also bounded her people today within a single contiguous territory and (written) language while the population of a fragmented and contentious Europe expanded its people and civilization across several continents. Today, the descendants of Han Chinese empire and the Rome Empire in Europe and the Americas are comparable in population size, but "a billion or so Europeans expanded to Europe and the Americas occupying some fifty separate and sovereign states across three vast continents, while more than a billion Chinese live in only one state." (Fairbank p. 14). With China's re-emergence as the world's second largest economy after four decades of rapid economic growth, can the ideology of a single ruler under Confucian-legalist synthesis endure in the new global order?



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**Appendix Table 1. Chinese Dynasties and Warfare**

Chinese Dynasties	Years	Number of Recorded Warfare	Average Number of Warfare per Year
Spring and Autumn and Warring States			
Spring and Autumn Period	770BC-476BC	386	1.31
Warring States Period	475BC-221BC	228	0.9
Unification Phase (I)			
Qin	221BC-206BC	10	0.67
Western Han	206BC-AD24	114	0.5
Eastern Han	25-220	273	1.4
Fragmentation Phase (I)			
Three Kingdoms	220-265	70	1.56
Western Jin	265-317	82	1.58
Eastern Jin	317-420	234	2.27
Southern and Northern Dynasties	420-589	109	0.64
Unification Phase (II)			
Sui	581-618	88	2.38
Tang	618-907	186	0.64
Fragmentation Phase (II)			
Five Dynasties and Ten Kingdoms	907-960	72	1.36
Northern Song	960-1127	192	1.15
Southern Song	1127-1279	241	1.59
Unification Phase (III)			
Yuan	1280-1368	209	2.38
Ming	1368-1644	565	2.05
Qing	1644-1911	376	1.41

**Source:** Number of warfare calculated from Military History of China (Writing Group) (ed.), *A Chronology of Warfare in Dynastic China (Zhongguo Lidai Zhanzheng Nianbiao)*.

## Appendix 2. Unit-root Test and Cointegration Test

We conduct three different unit-root tests to determine the number of orders: Augmented Dickey-Fuller Test (ADF), Phillips-Perron Test (PP) and Elliot-Lothman-Rosenstock Dickey-Fuller GLS Detrended Test (DF-GLS).<sup>30</sup> For robustness of our test results, we conducted above tests both with and without a trend term. The results are reported in Appendix Table 2. It shows that all the variables in Equation (2) are  $I(0)$  (stationary). In this case, the confirmation of pure  $I(0)$  in system and absence of  $I(2)$  or higher order allows us to proceed to the bounds test.

Next, we use Bounds test to confirm the existence of a long-run relationship between warfare and nation size and number of Agrarian regimes.<sup>31</sup> Pesaran et al. (2001) point out that the validity of Bounds test requires that there is no serial correlation between the residual terms between the residual terms of regression. Therefore, we conduct Breusch-Godfrey test of one-period or four-period lag, and the results show that there doesn't exist serial correlation, which means that Bound test can be carried out. The results can be seen from Appendix Table 3. It presents the values of  $F$ -statistics on the existence of long-run equilibrium between wars and the two outcome variables. As suggested by Pesaran et al. (2001) and Kumar Narayan and Singh (2007), we report our results in three scenarios: unrestricted constant without trend (Panel A), unrestricted constant with restricted trend (Panel B), and unrestricted constant with unrestricted trend (Panel C). Furthermore, optimal lag orders selected by AIC for size of nation model and agrarian regimes model are: [4,0,0,2], [2,0,0,2], respectively. In addition, the results of Bounds test show that the  $F$  statistics is statistically significant at 1% level under above three situations, which means that there is a long-term equilibrium relationship between warfare and nation size and Agrarian regimes.

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<sup>30</sup> The null hypotheses of all them is that the variable contains a unit root, and the alternative is that the variable was generated by a stationary process. Comparing with ADF and PP tests, DF-GLS has the advantage of higher power properties, which implies a low probability of type-II error.

<sup>31</sup> Bounds test is a  $F$  test for the coefficients of Error Correction Term, Narayan (2005) and provided the critical values of  $F$  statistics.



**Appendix Table 2. Unit-Root Test and Cointegration Test**

Series	Variables	Without trend			With trend			Order of Integration
		ADF	PP	DF-GLS	ADF	PP	DF-GLS	
Panel A: Dependent variables								
y <sub>1</sub>	Size of nation	-2.68(1)*	-2.82*	-1.90(1)*	-3.17(1)*	-3.37*	-3.07(1)**	I(0)
y <sub>2</sub>	Agrarian regimes	-3.46(3)**	-4.25***	-1.55(2)	-3.66(3)**	-4.29***	-3.20(2)**	I(0)
Panel B: Explanatory variables								
w <sub>1</sub>	Agrarian-nomadic wars	-7.05(1)***	-7.12***	-1.52(13)	-7.08(1)***	-7.16***	-2.29(13)	I(0)
w <sub>2</sub>	Civil wars	-6.52(3)***	-12.39***	-2.38(13)**	-6.53(3)***	-12.39***	-5.84(2)***	I(0)
w <sub>3</sub>	Peasant uprisings	-10.52(1)***	-10.42***	-1.63(14)	-11.00(1)***	-10.83***	-9.29(1)***	I(0)

**Notes:** Lags for ADF test and DF-GLS test are selected by Akaike Information Criterion (AIC) and are reported in parenthesis respectively. PP reports the *t*-statistics of Phillips-Perron unit-root test. \*, \*\*, \*\*\* denote the statistical significance of rejecting the null hypothesis of existence of unit-root.

**Appendix Table 3. Bounds Test for Cointegration between Wars and Agrarian Regimes**

Dependent variables	Size of nation	Agrarian regimes
	(1)	(2)
Panel A: Unrestricted constant		
F	5.86***	5.88***
$\chi^2_{SC}(1)$	0.02	0.00
$\chi^2_{SC}(4)$	2.72	0.41
Optimal lag	[4,0,0,2]	[2,0,0,2]
Panel B: Unrestricted constant, restricted trend		
F	4.78***	4.68***
$\chi^2_{SC}(1)$	0.001	0.001
$\chi^2_{SC}(4)$	2.99	0.46
Optimal lag	[4,0,0,2]	[2,0,0,2]
Panel C: Unrestricted constant, unrestricted trend		
F	5.97***	5.85***
$\chi^2_{SC}(1)$	0.001	0.001
$\chi^2_{SC}(4)$	2.99	0.46
Optimal lag	[4,0,0,2]	[2,0,0,2]

**Notes:** F reports the F-statistics for bounds test of each underlying model with optimal lags selected by AIC.  $\chi^2_{SC}(p)$  reports the test statistics and significance level for Breusch-Godfrey LM test for  $p^{\text{th}}$  order serial correlation ( $H_0$ : no serial correlation),  $p=1,4$ . Optimal lag reports the optimal lag selected by AIC. \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% levels.

#### **Appendix 4**

To illustrate more clearly how the impact of warfare on the size and number of agrarian regimes vary between phases of unification and fragmentation, we run the same baseline ARDL regression by dividing our sample into four subsets going from the most fragmented (with the largest number of agrarian regimes) to the most unified (with the lowest number of agrarian regimes). The results are illuminating as shown in Appendix Table 4. Indeed, warfare exert the most significant impact in China's most fragmented period: Agrarian-nomadic warfare and rebellions increase/decrease the size/number of agrarian regimes, but Civil Wars have the opposite effect. The most interesting is that Civil Wars reinforced fragmentation or multi-state competition during China's phases of fragmentation. But these warfare effects disappeared as China was becoming increasingly unified or achieved near unity. All these are consistent with our narrative.

We perform similar same econometric exercise by grouping our sample into subsets of fragmentation and unification that are composed of the concatenation of the second and third phase of fragmentation and the first through the third phases of unification respectively in Appendix Table 1. The results presented in Appendix Appendix Table 5 confirm the conclusion reached in Appendix Table 4: agrarian-nomadic warfare and rebellions increase/decrease the size/number of agrarian regimes, but Civil Wars have the opposite effect of reinforcing fragmentation or multi-state competition during China's phases of fragmentation. But these warfare effects disappeared as China was becoming increasingly unified or achieved near unity.

**Appendix Table 4. A Quantile Baseline Regressions**

	(1)	(2)	(3)	(4)
	0-25th	25-50th	50-75th	75-100th
	percentage	percentage	percentage	percentage
<b>Panel A. Dependent variable: Size of Agrarian Regimes</b>				
Agrarian-nomadic wars $\alpha_2$	16.55*	27.93	10.88	-148.38
	(8.84)	(36.41)	(36.37)	(399.65)
Civil wars $\alpha_{3-1}$	-84.34***	-83.31	99.17**	333.52
	(17.10)	(112.34)	(43.29)	(489.68)
Rebellions $\alpha_{3-2}$	61.38**	-48.48**	48.91**	697.22
	(28.10)	(20.44)	(20.43)	(523.41)
Control for extreme weather	YES	YES	YES	YES
Time trend	YES	YES	YES	YES
Adj. R <sup>2</sup>	0.98	0.80	0.88	0.28
AIC	391.38	577.78	503.13	866.20
BIC	425.80	603.39	528.73	899.97
t-statistic on ECT	-47.28***	-8.46***	-11.21***	-2.87
Optimal lag	[3,4,1,1]	[1,1,2,0]	[4,0,0,1]	[1,4,0,2]
N	50	53	46	61
<b>Panel B. Dependent variable: Number of Agrarian Regimes</b>				
Agrarian-nomadic wars	-5.88	-0.45**	0.02	-0.02
	(6.76)	(0.21)	(0.03)	(0.05)
Civil wars	3.01	0.40	-0.18*	-0.04
	(3.54)	(0.61)	(0.10)	(0.06)
Rebellions	4.75	0.36***	0.24**	-0.18**
	(6.41)	(0.12)	(0.09)	(0.09)
Control for extreme weather	YES	YES	YES	YES
Time trend	YES	YES	YES	YES
Adj. R <sup>2</sup>	0.11	0.65	0.96	0.80
AIC	-10.54	32.23	-172.42	-145.85
BIC	14.32	-4.65	-132.19	-112.07
t-statistic on ECT	-0.92	-5.02***	-19.25***	-5.12***
Optimal lag	[1,3,0,0]	[2,1,2,0]	[1,4,4,4]	[1,4,0,2]
N	50	53	46	61

**Notes:** Optimal lags are selected by the Akaike information criterion (AIC). T-statistic on ECT reports the result of Granger non-causality test on long-run causality, which tests the significance of the coefficient of the lagged ECT. Standard errors in parentheses \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Appendix Table 5. Regressions on Split Samples of Phases of Unification and Fragmentation**

	(1)	(2)	(3)	(4)
	Unification		Fragmentation	
	Size	Number	Size	Number
Agrarian-nomadic wars $\alpha_2$	210.27 (153.93)	-0.30 (0.18)	-110.17 (227.95)	-0.39* (0.22)
Civil wars $\alpha_{3-1}$	386.10 (298.45)	0.03 (0.29)	26.30 (274.04)	1.14* (0.65)
Rebellions $\alpha_{3-2}$	83.81 (119.57)	0.10 (0.14)	54.91 (298.41)	1.16** (0.46)
Control for extreme weather	YES	YES	YES	YES
Time trend	YES	YES	YES	YES
Adj. R <sup>2</sup>	0.26	0.35	0.49	0.41
AIC	1919.92	-116.24	812.05	-33.53
BIC	1958.53	-74.66	847.08	-5.07
t-statistic on ECT	-4.20**	-3.07	-11.21***	-4.54**
Optimal lag	[2,0,0,2]	[3,0,0,2]	[4,0,0,1]	[2,0,2,0]
N	144	144	66	66

**Notes:** Optimal lags are selected by the Akaike information criterion (AIC). T-statistic on ECT reports the result of Granger non-causality test on long-run causality, which tests the significance of the coefficient of the lagged ECT. Standard errors in parentheses \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

We expound the above empirical findings by invoking the theoretical insights in Ko et al (2018) that unidirectional threats enhance unity (as in the case of nomadic attacks on China) whereas multi-sided military threats (as in the case of inter-state based military competition in Europe) reinforces fragmentation. As in their model, multiple sided military threats in a European inter-state framework were conducive to political fragmentation or decentralization as resources needed to counter such threats tended to be raised locally, hence strengthening local autonomy. We can surmise that state-based Civil Wars in Chinese history had similar decentralizing role as the European pattern of warfare.