Political Fragmentation and Economic Growth in South Asia from 1400 to 1900

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December 9, 2019

Abstract

How did political fragmentation impact economic growth outside of Europe? Scholarship on Western Europe has linked political fragmentation to Europe's rise as an economic powerhouse, but there is limited quantitative evidence addressing the impact of fragmentation elsewhere. I argue that fragmentation may not result in persistent warfare as in Europe, where external threat was largely unidirectional and new empires were established by foreign dynasties. Reliance on alliances and negotiations instead of military conflict could incentivize rulers to engage in conspicuous consumption and gift-giving. Using a novel dataset of political borders and city characteristics in South Asia between 1400 and 1900, I find that while exposure to violent conflict reduces economic growth, fragmentation's impact is limited due to the scarcity of wars. In addition, elite consumption in capital cities maintained inter-regional trade and growth. The paper points to the importance of political geography and informal institutions in mediating the effect of fragmentation on economic growth.

Keywords: history of economic growth, urban development, historical institutions, pre-colonial South Asia

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The author thanks Kriti Seth for valuable research assistance for this project and is grateful for helpful discussion and feedback from participants at CaliWEPS 2019; Lisa Blaydes, Gary Cox, Valentin Figueroa, Vicky Fouka, Saad Gulzar, Steve Haber, and Saumitra Jha.

1 Introduction

In explaining European exceptionalism in the development of democratic institutions and igniting economic growth, numerous scholars have cited the importance of high levels of political fragmentation in Europe compared to other parts of the world. After the fall of the Roman and Carolingian empires, Western Europe remained divided amongst city states, lords, and monarchs. The competitive pressures generated by these divisions imposed both *de jure* and *de facto* constrainst on European monarchs (Blaydes & Chaney 2013, Stasavage 2016). Fragmentation combined with Europe's nascent representative institutions paved the way for guaranteeing better terms of trade, increased integration of markets, and "Smithsian" economic growth (Cox 2017, Dincecco 2010, Jones 2003) War between these units had in turn contributed to the rise of effective states, bureaucratic capacity, and national taxation (Tilly 1990). Some students of European history claim that "modernity" would have been unimaginable without persistent polycentrism in Europe (Scheidel 2019).

The underlying assumption of these studies is that other parts of the world were dominated by "serial imperialism" (Scheidel 2019). However, variation in imperial durability and political fragmentation even outside of Europe exsist. Historians have highlighted that it was similarly difficult to establish lasting empires in the South Asian subcontinent. In both Europe and South Asia power emenated from stable "core areas" and natural barriers raised the costs of empire formation and structured where polities formed (Jones 2003). Jones (2003) notes that the grand game of South Asian history was uniting the fractured subcontinent and that "unity was hard to maintain." The parallels between Europe and South Asia in political fragmentation beg the question of what the impact of political fragmentation was on economic growth in South Asia?

I argue that political fragmentation in South Asia had limited impact on growth because of lower levels of military conflict and the importance of elite demand for the maintenance of long-distance trade. Fragmentation of large empires in South Asia was prompted most often by incursions of nomadic tribes from Central Asia who were also successful at establishing their own dynasties. Military superiority allowed quick conquest,

but in order to establish an empire new rulers had to rely on alliances and incorporation of local elites into the empire (Mann 2014). In order to indicate their higher political and ritual status amongst competing local chiefs, South Asian rulers also used conspicous consumption and gift-giving to legitimate their rule. South Asia's political geography, therefore, likely to have reduced the need for warfare, which mitigated one of the serious negative consequences of fragmentation in Europe (Tilly 1990). In addition, a large European and a smaller non-European literature claims that jurisdictional fragmentation was a source of coordination failures and free-riding which raised transaction costs to trade (Epstein 2000, Dincecco 2010, Cox 2017, Blaydes & Paik 2019). However, South Asian historians have argued that trade in luxury goods remained important for elite consumption and continued even during higher levels of fragmentation (Bayly 1988). Therefore, the practice of conspicuous consumption served to limit overtaxation of merchants and barriers to trade.

To test these arguments, I assemble a dataset of 202 South Asian cities and their characteristics such as population level, geographical, and institutional characteristics for the period between 1400 and 1900. My sample includes cities from modern-day Afghanistan, Pakistan, India, Nepal, Bangladesh, and Sri Lanka that are identified in Chandler & Fox (2013), which collects data on city populations from 800 AD into the 20^{th} century around the world. City growth rates have been a widely used measure of economic development for historical periods when standard economic measurements are not available (Acemoglu et al. 2002, De Vries 2013, Bosker et al. 2013).

I find that fragmentation has a negative impact on economic growth and trade, which is driven by exposure to violent conflict. This effect is concetrated in the 18^{th} and 19^{th} centuries when fragmentation and the entry of European powers intensified conflict. I do not find an independent effect of fragmentation on trade roads or cities' proximity to borders. I explain this by the resilience of South Asian capitals as a source of conspicuous consumption. I demonstrate that consumption in capitals served as an important source of economic growth and while trade declined with higher fragmentation in non-capitals, seats of political power remain unaffected.

One contribution of this paper is integrating the study of South Asia into the quantitative scholarship on political fragmentation and economic growth. Previous works have compared Europe and the Middle East (Blaydes & Chaney 2013) and Europe and China (Dincecco & Wang 2018, Rosenthal & Wong 2011) on political fragmentation. This scholarship, however, draws these regions into stark contrast: one with persistently high levels of fragmentation and the other with relatively little. South Asia, on the other hand, is comparable to Europe during some periods with many competing polities, but its few cases of stable empires also allow us to contrast it with the Ottoman or Chinese empires. Therefore, the subcontinent becomes an important case for testing theories developed based on Europe as well as large empires.

Despite being the most densely inhabited region in the world at the beginning of the seventeenth century with estimated urbanization rates of 10-15 percent (Bolt et al. 2018), to this author's knowledge, no study on South Asia's economic history has attempted to study the the relationship between trade, warfare, and fragmentation quantitatively. Studying fragmentation rigorously in other parts of the world is important for understanding why Europe got ahead. However, it is equally important for uncovering the institutions that created bottlenecks and economic stagnation in parts of the world that Europeans came to colonize (Kuran 2004). I add to recent work by Blaydes & Paik (2019) on the impact of fragmentation in East and Central Asia and show that fragmentation via its impact on military competition also reduced growth rates in South Asia. Lastly, this study builds on works on European economic history that try to disentangle quantitatively why fragmentation mattered in Europe. Here I suggest that the interaction of political fragmentation with political geography and informal institutions may produce different results in other parts of the world.

2 Political Geography, Fragmentation, and Growth

2.1 In Europe

There is no shortage of studies extolling the advantages fragmentation provided for Europe. Following disintegration after the fall of the Carolingian empire, there was a high number of competing polities in Western Europe. States in Eastern Europe acted as a buffer zone protecting Western and Northern Europe from Central Asian nomadic incursions. The fragmented, but insulated political geography of Western Europe, therefore, generated multidirectional external threats for polities (Dincecco & Wang 2018). Military competition and fragmentation reinforced each other and remained persistent features of the Western European landscape.

Did persistent warfare dampen growth in Europe? On the long-run, wars created a more urban Europe (Dincecco & Onorato 2016). The pressures of warfare also prompted rulers to centralize, develop bureaucracies, and raise revenue (Tilly 1990, Dincecco & Prado 2012, Gennaioli & Voth 2015, Rosenthal & Wong 2011). In turn, they were often required to supply non-military public goods as well (Dincecco et al. 2011). High-capacity states with constitutionally-constrained monarchs provided ideal conditions for economic development eventually. In the short-term, however, warfare is likely to have limited growth instead of aiding it. Economists have also argued that an important component of igniting economic growth in Europe was achieving higher levels of trade in the pre-modern period (Epstein 2000). Violent conflict increased transaction costs and reduced trade (Epstein 2000). Therefore, fragmentation provided Europe with stronger and more centralized states on the long-run, but its immediate impact was to slow down development.

Political fragmentation may have reduced growth by introducing free-riding and overtaxation. Internal political fragmentation with multiple claims over jurisdictions as well as the medley of measurements and currencies across Europe remained obstacles to trade until rulers began to centralize their states (Epstein 2000). Furthermore, a single ruler overseeing an area had higher incentives to provide safety over roads and public goods, while divided authority may have resulted in free-riding. Furthermore, each

ruler overseeing a trade route was interested in extracting taxes for merchants passing through, which resulted in heavy tax burdens for merchants. At the same time, the mosaic of polities over Western Europe provided exit options. Merchants could appeal to different authorities to provide more favorable protections and rights (Jones 2003). As representative institutions spread around the continent, polities engaged in a competitive bidding to provide better terms of trade (Cox 2017).

Compared to smaller European states, empires had efficiency of scale advantages, which stimulated trade. Emperors could tax merchants at the optimal level as monopolists (Cox 2017). By the practice of tribute-taking, empires could also aid the development of inter-regional trade (Bang 2003, Bayly 1988). Although scholars have pointed to the prevalence of arbitrary expropriation in empires that could have stifled trade, recent studies show that this may have been overstated in some areas. Gupta et al. (2016) argue that there is little evidence to suggest arbitrary expropriations in the Mughal Empire, whereas in pre-modern China despite the stability of land rights, the stability of mercantile property varied with the political protector of merchant guilds,

These accounts suggest that empires were conducive to economic exchange and growth as they reduced transaction costs by providing public goods and safety. On the other hand, empires also reduced inter-polity competition for merchants and innovation, which on the long-run could have stifled growth rates. Finally, fragmentation was important for growth through its impact on stimulating warfare and increasing taxation on merchants.

2.2 In South Asia

Historians have highlighted that South Asia was similar to Europe in the high costs of establishing an empire. Modelski (1964) remarked on "the fluidity of [India's] political and international systems." Jones (2003) has also argued that "the matrix of nuclear areas and natural barriers [in South Asia] smacks of Europe, especially as the same political divisions recur throughout history [...]. [As] in Europe, it was costly to try to rule the subcontinent as a single empire." While not as fragmented as northwestern Europe, an

empire ruling over the whole of subcontinent was the exception rather than the norm.[1] This stands somewhat in contrast with China that experienced relative consolidation after 1500 as well as much of the Middle East, which was ruled by the Ottoman Empire. In fact, South Asia represents an intermediary case between Europe and more unified regions: South Asia on average had 22 polities between 1400 and 1900, while Europe had around 85 states between 1000 and 1799 and China had 1.5 (Dincecco & Wang 2018).[2] As it has characteristics of fragmentation as well as empire, lessons on fragmentation and economic growth in South Asia may travel to other regions as well.

Within the period under consideration, the subcontinent has gone through a significant amount of change. Table 1 summarizes the key events.[3] A permanent feature of South Asian state-building in this period, however, was invasions by Central Asian tribes from the North who subsequently established their own dynasties. A symbiotic relationship between sedentary and agrarian peoples have been noted in case of Chinese and Middle Eastern empires: sedentary villages interacted with nomadic tribes to trade agrian products for cattle. Pastoral nomadic tribes, however, had been superior warriors compared to sedentary communities, which enabled them to raid these communities (Turchin 2009).

Similarly to the agrarian zones of China and the Middle East, the South Asian

[1]Only three times during the region's history was such a feat achieved: under Ashoka (268-232 BCE), Aurangzeb (1658-1707), and finally during British rule.

[2]The South Asian case is likely to be an underestimate as it does not fully incorporate the 565 princely states that were officially recognized in British India at the time of partition.

[3]During the period the subcontinent goes through successive state-building efforts, followed by fragmentation both in the North and the South. There are successive invasions by Central Asian Turks that establish dynasties in the North from the 13^{th} onwards. The Mamluk, Khalji, Tughlaq, Sayyid, and Lodi dynasties all had their origin in Turkic or Afghan tribes that established their rule over the northern part of the subcontinent. They were replaced by the Mughal empire in the 16^{th} century. In the South the Hindu Vijaynagara Empire was the dominant power. By the early 17^{th} century, the Mughal empire started to expand toward contemporary South India. The Mughal emperor, Akbar besides expanding the empire began administrative reforms by comissioning cadastral surveys, tax reforms, and revitalizing the imperial bureaucracy. Subsequent rulers continued to expand Mughal rule southwards. In the same time frame, Vijayanagara's grip over the South crumbled due to internal conflict and increasing threat of Muslim polities from the north. Shortly before the 18^{th} century the Mughal empire reaches its zenith under Aurangzeb before falling prey to invasions from the northwest and the increasing independence of imperial office holders. While previously the 18^{th} century has been described as a period of devastation and chaos, this has been largely discredited in recent works. Bayly (1988, p.36) argues that the supposed "Dark Age" of the 18^{th} century was not so much the "collapse of a political culture", but rather "cyclical realignment". Bayly (1988) claims that there was a redistribution of capital, political power, and population across the subcontinent following the creation of new regional states. On the other hand, the old Mughal administrative lineages, merchant caste organizations, and religious establishments ensured continuity of governance and trade Bayly (1988).

subcontinent also borders the Arid Zone, a dry ecological zone that runs from the Atlantic coast of Africa to southern India. Invasions and raids from the steppes of Central Asia were a frequent danger to South Asian polities so much so that Gommans (1998) describes it as the "political womb" of South Asia. While China also faced a threat by nomadic tribes from the steppes, these tribes did not establish permanent rule over East Asia. Many north and south Indian political dynasties, however, have their origin in the Central Asian steppes amongst them the Mughal empire (Nath 2019).[4] This was not only because of the military advantage nomadic tribes could build up in the steppes, but the disadvantage South Asian polities experienced. Since horses could only be purchased from the Arid Zone steppes due to the insuitability of the subcontinent for grazing, once new polities were established they remained reliant on the often unstable supply of horses from the steppes (Nath 2019, Gommans 1998). This left South Asian polities vulnerable to northwestern invaders who often went on to establish their own states.

Central Asian invasions and successive rule led to a particular style of state-building. While nomadic tribes had a military advantage—aiding them in quick conquest—, to establish rule they had to rely on methods other than warfare as well. Historians have noted the "segmentary nature" of rule in South Asian states (Stein 1989, Mann 2014). While rulers often made claims of universal dominion, in reality they had to rely on local chiefs, so-called "little kings." Emperors instead of conducting costly campaigns incorporated these little kings into the empire and required them to pay tribute.[5] An important part of state-building was incorporation and alliance-making that took place through ritual ceremonies, conferring lavish gifts, land titles, and revenue exemptions. This enabled South Asian rulers to reduce internal military threats, but they had to give up their local fiscal extractive capacity (Gupta et al. 2016).

Incorporation as opposed to war had important consequences for violence and trade in the subcontinent. Despite high levels of military labor supply and a well-armed peasantry,

[4]The founders of Delhi Sultanetes were Turkic in origin—Mamluk, Khalji, Tughlaq, Sayyid, Lodi, and Mughal dynasties. Several of the South Indian sultenates also had Turkic founders such as Barid Shahis, Adil Shahis, Bahmanis, and Qutb Shahis.

[5]Barkey (1994) notes that state centralization in the Ottoman Empire also took place through incorporation of those who opposed imperial rule, contrary to European models of outside wars.

South Asia saw fewer internal and external wars than China or England (Gupta et al. 2016).[6] Figures 1-2 illustrate how violent conflict in South Asia compared to China and England. Out of the three, India has the least number of wars, although the number of conflicts increases by the 18th and 19th centuries due to wars between South Asian and European powers. Furthermore, while in China the proportion of internal conflicts remains high throughout, in South Asia it declines as European expansion becomes a more pressing problem on the subcontinent.

Even though wars were less frequent than in other parts of the world, there is some indication that conflict still made trade more dangerous. Mughal rule, for example, was associated with safety on roads which contributed to the expansion of economic prosperity, inter-regional, and international trade, the so-called *Pax Mughalica*. Conversely, fragmentation, warfare, and the rise of banditry in the countryside in the 18th century reduced trade due to higher transaction costs (Bayly 1988). Warfare on the subcontinent became more frequent during this period not only due to disintegration of Mughal rule, but because of the entry of European powers into competition for territory and revenue (Gupta et al. 2016). While British rule was exploitative, the creation of empire once again contributed to market integration and growth especially in towns where Company factories were located (Gaikwad 2014, Bayly 1988, Roy 2016).

The reliance on incorporation and alliance-making instead of wars made conspicuous consumption and gift-giving an important mechanism for rulers to mark and legitimate their rule. While ruling elites in most societies were great spenders, there was a ritual importance to spending and gifting amongst South Asian elites.[7] Bayly (1988, p.59) states that the "king's role as chief gift-giver and receiver was a reflection of his ancient status as sacrificier-in-chief and preserver of the order of castes." Kings were also expected to spend

[6]South Asia had a high level of military labor supply and historical accounts have revealed that the peasantry remained armed so much so that they could impede tax collectors entry to villages (Gommans et al. 2003). Empires could reduce the threat of violence by hiring at least some portion of armed bands and provide general safey.

[7]Jones (2003, p.110), for example, discusses that the ruler of Awadh owned "1782 jewels then valued at £8,000,000. He had 20 palaces, more than 100 private gardens, 4,000 gardeners, ... 1,500 double-barreled guns, ... 1,200 elephants, 3,000 saddle horses, 1,000 hounting dogs, and 3,000 servants, [...], looked after him." While some European rulers such as the Russian tsars or Louis XIV may have compared in their possessions, Jones (2003, p.110) argues that the life of monarchs in Europe was comfortable, but "not on the scale that measures the grandeur of Asian emperors."

on festivals and rituals, often up to 30 percent of their income (Bayly 1988). Muslim rulers similarly adapted these Hindu traditions. Furthermore, Muslim rulers due to uncertainty of inheritance rules had to manifest their legitimacy by their religiosity, military prowess and, above all, pomp and ceremony (Bayly 1988, Mann 2014).

The importance of consumption amongst imperial elites had led Max Weber (1958) to term imperial cities as "consumer cities". According to Weber, consumer cities predominated in India and they were dependent on the purchasing power of nobles and ruling classes. Apart from the royal family, elites engaged in conspicuous consumption too. Mughal officials, for example, had one of the highest salaries in the world during their time and the norm was "spending rather than hoarding" (Raychaudhuri & Habib 1982, Moreland 1920). In order to prevent Mughal officials enriching themselves by overtaxing peasants or building up their local base, Akbar frequently rotated officials and forbade the transfer of wealth to their offspring (Gilbert 2017, p.71). The latter measure encouraged officials to spend and was a great boon for local artisans and merchants (Gilbert 2017).

The relative stability of elite demand for luxury goods meant that a high proportion of inter-regional trade was composed of luxury items (Raychaudhuri & Habib 1982, Bayly 1988). Furthermore, merchants—even in times of political instability—could pass on higher transaction costs of trade to their wealthy customers. This created less dislocation in trade during times of fragmentation than what would be expected due to the rise in transaction costs. Highly-specialized merchant networks that often overlapped with caste and were independent of rulers could ensure that trade was responsive to fluctuations in power (Bayly 1988). Merchant organizations, especially those trading in luxury goods, were sufficiently capitalized to be able to weather dangers of long-distance trade. This meant that combined with continuous elite demand for luxury goods and the presenece of merchant networks who were organized in this trade, fragmentation may have posed less of a threat to trade and thus growth in South Asia than in Europe.

The historical evidence on the sources and consequences of fragmentation, therefore, implies that the political geography in South Asia resulted in a type of state-building different from the European. Under some conditions, similar to Europe, fragmentation

created warfare and wars made trade more expensive, more dangerous, which could have dampened growth. At the same time, wars were infrequent due to incorporation of local rivals into the empire. Second, alliances with and reliance on local chiefs prompted rulers to engage in conspicuous consumption to legitimate their rule. There are good reasons to believe that elite consumption ensured the continuance of trade. Since rulers legitimized their rule by spending, imperial cities were centers of demand and consumption, attracting merchants and artisans. As primary consumers, princes relied on merchants for supply making their overtaxation or extortion less likely. In the following sections, I turn to my operationalization of the main variables and to empirically testing the impact of fragmentation on growth. Then, I explore the two possible mechanisms: the role of warfare and imperial cities in constraining or enabling trade in times of fragmentation.

3 Dataset and Measurement

For certain historical periods for which conventional economic measures are not available, economists have relied on city population growth as a measure of development (De Vries 2013). For the study of European and Middle Eastern city growth, Bosker et al. (2013) assemble a dataset that records city characteristics in Europe and the Middle East by century. No comparable dataset exists for other parts of the world, which means there is a dearth of quantitative evidence on pre-colonial economic growth and institutions outside of Europe and the Middle East. In order to investigate the relationship between fragmentation and economic growth in South Asia, I assemble a dataset of cities' population and their historical characteristics for modern-day Afghanistan, Pakistan, India, Bangladesh, Nepal, and Sri Lanka. In this section I briefly discuss my measurement strategy for the key variables and the different city characteristics on which I collect information, while I relegate the more specific details of data collection to the Data Appendix.

I limit the analysis to the period between 1400 and 1900. I take 1400 as the starting date for the dataset due to better quality and more available information on population following this period. My cutoff point for the dataset is 1900 in order to exclude modern

drivers of city growth. This gives a panel of cities with six time periods: each century from 1400 to 1800 as well as 1800 to 1849 and 1850 to 1899. I divide the 19th century into two periods for two reasons. First, due to regular British censuses after 1880, data on city sizes become more regular and more reliable. The second reason is that 1857 marked the Great Rebellion against the rule of the East India Company which precipitated direct rule in much of the subcontinent. This was a watershed moment as the administration of the subcontinent came directly under the purview of the British Crown.

Building on a long line of prior literature on historical state and economic structure, I regard city population growth as a reasonable indicator for economic growth (De Vries 2013). First, in order to construct a measure of city size for each city in my dataset, I create an estimate of the population for each time period. For this, I make use of a dataset collected by Chandler & Fox (2013), which records estimated city sizes around the world from 800 AD to the 20th century (hereafter, Chandler). The Chandler dataset has been used to study historical inter-city growth clusters around the world (Cox 2017) and economic growth in the Middle East, Central and South Asia in response to trade shocks (Blaydes & Paik Forthcoming).[8] The Chandler dataset has been entered in a tabular form and geocoded by Reba et al. (2016). In order to produce a sample of cities, I restrict my analysis to those urban centres that have any data about their population between 1400 and 1900. This is to exclude cities from the original Chandler dataset that were founded in prior centuries, but by 1400 are likely to have disappeared or industrial cities that were established in the 20th century. This yields a total of 202 cities in South Asia.

A further advantage of the Chandler dataset is that it also contains the ranking of the largest cities in the world for every century ranked by size. While most cities on this ranked list have a population estimate, many do not. In order to assign a population estimate to cities with a missing ranking, I exploit the close relationship between city size and ranking according to the power law (Gabaix 1999). Therefore, if a South Asian city is ranked as one of the world's largest in Chandler without a population assigned, I use

[8]In addition, Blaydes & Paik (Forthcoming) compare the Chandler dataset for Europe and the Middle East to datasets created by Bosker et al. (2013) and Bairoch (1991) and find the Chandler dataset to be highly correlated with the other two.

the power law to produce a measure of city size. Since it has been shown that Zipf's law does not apply universally across time or space (Glaeser 2014, Cox 2016), I regress the natural logarithm of population on logged rank restricted to a particular time period and predict missing values using the coefficient on logged rank.[9]

In order to construct period-wise population estimates, I use yearly population figures given in Chandler from 1400 to 1900. Given that for most years data is missing, I take the average population for each time period. The major challenge with the Chandler dataset is that some cities lack population estimates for a given period. To deal with this problem, I construct a population interval for each city to account for the uncertainty in city size. When a city has a population estimate for a particular period, I use that as both the lower and upper bound for the interval. If a city does not have an estimate for a particular time period, but the ranking of the city is available, I use the estimated population based on the ranking as both the lower and upper bound. When neither city size nor the ranking is available, I assign zero as a conservative lower bound for the city's population. Next, I check whether the city's establishment date was prior to the period for which the data is missing or if the city has population data for an earlier time period. If either of these two conditions is true, I assign the population of the smallest city in that period as the upper bound for the population. I assume that if the city was larger than the smallest city in that particular period, it would be more likely to have a population record. If neither of the above conditions hold, I assign zero as the upper bound as well. Blaydes & Paik (Forthcoming) encounter a similar problem in measuring population sizes for Muslim and Christian cities using the Chandler dataset. They also construct a population interval. My measurement procedure is similar to theirs, except I use not only city rankings, but also city foundation date and the earliest year in which a city has population figure to reason about the population size.

The data quality improves for each subsequent century. Between the 15^{th} and 17^{th} centuries about 30 cities have population estimates from Chandler, for the 18^{th} century

[9]Only a limited number of cities have population data extrapolated from rankings. For 17^{th} century I assign population data to only four cities out of 202, for 18^{th} century only to one city and for early 19^{th} century to eleven cities. No cities in late 19^{th} century were assigned population data based on extrapolation.

this is 52 cities, for the early and late 19th century this is 106 and 164 respectively. Capital cities have better population data coverage: it is likely that this dataset is biased toward capitals since historians and contemporary observers would have been more likely to follow closely the history of significant cities. To deal with this problem, I use the certainty score assigned to each observation in Reba et al. (2016) and check whether results are robust to restricting the sample to those cities that have the best quality data. I also use only those cities that have non-imputed data to test my hypotheses. To estimate period-to-period population growth for each city, I take the midpoint of the upper and lower bound of the population estimates and calculate the percent growth with regards to the previous time period.[10]

While several studies have reasoned about the importance of political fragmentation for Europe, few studies attempted to measure fragmentation directly (Dincecco (2010) and Blaydes & Paik (2019) are exceptions). Here, I use three different measures of political fragmentation to capture different possible causal mechanisms. First, I use the number of sovereign polities on the subcontinent. This should capture the average military competition on the subcontinent and the number of different jurisdictions merchants might have had to cross. Second, I measure the number of borders that are within a 100 km radius of a city. This measure may be more closely related to another hypothesized effect of fragmentation: the provision of exit options for merchants. Finally, I digitize trade routes in South Asia based on Schwartzberg (1978) and count the number of different polities that a road segment crosses to capture more directly impediments to trade if overtaxation is a concern. I discuss further the construction of these measures in the Data Appendix.

There is scarcely any data on trade volumes in South Asia, especially prior to colonial rule. To estimate to what extent cities were trade with surrounding cities, I use growth in urban potential for each city in each time period. Urban potential has been a conventional measure of market integration (De Vries 2013). I define urban potential the same way

[10]There are some cities that have zero both as their upper and lower bound estimates. In order to calculate a growth rate for the next time period for these cities, instead I assign 0.00001 as the population estimate.

as others in the literature: $UP_{jt} = \sum_{i \neq j} \frac{pop_{it}}{D_{ij}}$.[11] This takes into account to what extent city j's population in time period t depends on other cities' population discounted by the distance between city i and j. The main intuition behind the measure is that when markets are integrated, prices in two cities should be the same barring the price of arbitrage between them. Therefore, over time prices should converge. When cities are trading with each other, there should be a positive correlation between their prices, whereas when they are not trading, there should be a negative correlation between prices. This should apply to the relationship between the population growth of a city and its growth in urban potential.

To test my two proposed mechanisms I have also collected data on battles to capture the effect of warfare and capital cities to measure the impact of elite consumption. To capture exposure to military conflict, I note if there were any battles as well as the number of battles in the 100 km radius of a city in the prior period. To code which cities had political status—capital city or administrative center status—in each century, I rely on the Historical Atlas of South Asia 1978 (Schwartzberg Atlas hereafter). The Schwartzberg Atlas has been used in other studies on historical South Asia to identify medieval temple locations (Iyer et al. 2017). I discuss the period-specific coding of cities with political status in the Data Appendix.

To account for other factors that could influence trade exposure or growth, I also use the Schwartzberg Atlas and other historical sources to assign geographic characteristics to each city.[12] I measure proximity to any rivers, a navigable river, a coast, an overland trade route, as well as the city's elevation.

Table 2 displays summary statistics for the 202 cities in my time period. It shows that fragmentation remained rather limited on the subcontinent compared to Europe, but definitely higher than in other regions with tributary empires. The number of sovereign polities was not above 30 during the time period. The average city was located close to only one border, but there is some variation over time. At the most extreme fragmentation,

[11] I use STATA's `spgen` package to measure urban potential.

[12] For navigable rivers and trade routes I rely on the *Atlas of the Mughal Empire* by Habib, while for railway connectivity I use the Survey of India map showing Indian railways lines.

some cities were close to 4 different borders. Similarly there is variation on fragmentation over trade roads with some trade roads having 10 polities while others only one. Regarding exposure to conspicuous consumption, about 15% of cities become capitals at some point during the time period. As seen in Figures 1, there is limited violent conflict in the subcontinent—only 6% of cities are exposed to a battle at any time. In the following I examine the trends between fragmentation and growth as well as the proposed causal mechanisms.

4 Empirical Analysis

To begin, I examine the trends in fragmentation and city growth qualitatively. Figures 3-4 represent the number of polities and the extent of city growth over time. Economic growth appears highest within the larger empires: Mughal empire in the 17^{th} century and the British Empire in the 19^{th} century show the greatest amount of overall growth. Spatially it does not seem like growth rates are closely related to borders, which would imply that merchants can generate competition across polities for better terms of trade. Rather, cities near the coasts and along the Ganges river appear to be benefiting from higher and stable growth rates.

Next, I use the panel data structure of my dataset to identify the impact of fragmentation on economic growth. To do so, I rely on the following empirical specification:

$$\log(growth)_{i,t} = \alpha + \beta fragm_{i,t} + \gamma_i + \delta_t + \theta \mathbf{X}_{i,t} \times \delta_t + \epsilon_{i,t}.$$

Here, the dependent variable is the logged growth rate of city i in period t. The coefficient of interest is β, which captures the impact of fragmentation for city i in period t. In order to control for time-invariant city-specific characteristics I include city fixed effects, γ_i, and to control for period-specific common shocks, I include period fixed effects, δ_t. In addition, I include a vector of geographic controls for elevation; location next to a river, a coast, a navigable river, and trade route interacted with period fixed effects to capture any time-variant impact of geography. Finally, I also control for the city being a

capital city in a specific period as well as for growth in urban potential. I cluster standard errors, $\epsilon_{i,t}$, at the city-level.

Table 3 summarizes the main results. The main independent variable for this specification is the number of polities in the subcontinent. In line with other previous literature on the negative impact of political fragmentation on growth, the results show that higher political fragmentation leads to lower growth. An additonal polity in the subcontinent lowers city growth rate by 5.9-14.2 percent (p-value = 0.017). This result is robust to including controls for the period-spefic effect of geographic characteristics (Column (2)). As a final check I include a variable for being a capital city (Column (3)) and growth in urban potential (Column (4)). The effect size is robust to these specifications.

Other measures of fragmentation, however, do not seem to matter for growth. In Table 4, I use the number of borders within the 100 km radius of a city as the measure of fragmentation. This variable could capture competition across cities and polities on different sides of the border for merchants, artisans, and workers. The effect of fragmentation at first is positive, but as I include controls for capital city status, it switches to negative. Furthermore, standard errors are large and the results remain consistently statistically insignificant. This implies that fragmentation did not produce similar competition for people across rulers.

My final measure of fragmentation is the number of polities along the trade road that lies within 50 kilometers of a city. If fragmentation induced overtaxation and lower levels of public goods provision along the trade road, it will raise transaction coasts for merchants and lower growth. However, this does not seem to be the case based on Table 5. While the coefficient on fragmentation over a trade road remains negative, it is not significant. This suggests that multiple rulers over trade roads may not have hindered commerce in South Asia to the same extent as it did in Europe.

A problem with the estimation of the effect of fragmentation on growth is that exposure to fragmentation is endogenous to other factors. For example, some cities may be located in an area that is prone to climatic shocks or disasters, which may make it hard for any state authority to govern there persistently. Given that fragmentation was most often

driven by Central Asian nomadic invasions from the northwest, it is likely that those cities that are closer to the Khyber Pass, which was one of the main avenues for these invasions, are more likely to have exposure to exogenous source of state fragmentation. To test the effect of exogenous exposure to fragmentation, I restrict my sample to cities situated above the Deccan Platteau. The Deccan Platteau serves as natural barrier across the Northern and Southern part of South Asia and it is situated around 17° latitude. Table 6 displays the results from the restricted sample. This slightly reduces the significance of the impact of the number of polities on the subcontinent (p-value = 0.058), but the direction of the coefficient remains negative. The other two measures of fragmentation are not statistically significant, although the coefficient on the number of borders changes signs and switches to positive.

The results imply that higher number of polities in the subcontinent resulted in lower growth on average, but more localized measures of fragmentation do not seem to matter. The number of borders around a city that could provide exit options to merchants or jurisdictional fragmentation over trade routes does not impact growth. Why is there only limited evidence about fragmentation's impact on economic development in South Asia? The following sections explore the potential mechanisms that could have augmented or mollified fragmentation's impact.

4.1 Channels

4.1.1 Warfare, Fragmentation, and Growth

According to the literature on European fragmentation, a high concentration of polities often led to military competition and warfare. Battles, looting, and devastation made trade dangerous and increased transaction costs. In the South Asian context, historians have noted that the disintegration of larger states led to less safety over trade routes as well. Figure 5 summarizes the relationship between the number of polities and battles in the previous time period in South Asia. It appears that higher levels of battles in the previous century resulted in lower levels of fragmentation. This relationship is stronger in the 18^{th} century and afterwards. During this time period, the EIC started gaining

more territorial control in the region, which suggests that battles were primarily fought to consolidate the empire.

In the following I examine the relationship between exposure to warfare, trade, and growth. It is possible that the effect of fragmentation on growth would move through exposure to violent conflict which could act as a barrier to trade. In order to test this argument, I have coded cities' exposure to violent conflict in the previous time period. Appendix Figure 5 shows the total number of battles in South Asia between 1300 and 1900. First I examine if battle exposure slowed down economic growth. According to Table 7 exposure to a battle in the prior century did not slow down city growth. The coefficient on exposure to battles is negative, but not significant. Next, I test my proposed mechanism: the impact of battles on growth via trade. A positive correlation between growth in urban potential and city growth can be taken as an indicator free trade across cities. Column (2) of Table 7, however, indicates that conditional on battle exposure, cities experience less trade. This relationship is even stronger during and after the 18^{th} century, a period of increasing military competition between South Asian states and European trading companies.

While it is possible that rulers carefully picked battle locations not to disrupt trade routes, there is more evidence that the negative relationship between battle exposure and urban growth correlations are due to the effects of conflict exposure. Since there was a high military labor supply in the subcontinent, when larger empires did not employ armed groups, they often resorted to looting villages and merchants (Gommans et al. 2003). Rulers' gift-giver status also encouraged sacking cities and the redistribution of what had been looted. The removal of wealth from cities, therefore, may have contributed to slowdown in trade.

The negative impact of battle exposure suggests that the reduction in growth experienced under high fragmentation is due to higher levels of warfare. This impact is limited as only very few cities experience any battles. This is likely due to the low number of battles in South Asia compared to Europe or China (Gupta et al. 2016). Taken together, these results imply that military competition could have moderated the impact of fragmentation

in South Asia on growth, but due to the low number of conflicts this negative impact remained limited and transitory.

4.1.2 Elite Consumption, Fragmentation, and Growth

While pre-modern urban growth in Western Europe was mainly driven by market-related factors, in other parts of the world political factors were deemed more important (Van Bavel et al. 2013, Bosker et al. 2013). The largest cities in Eurasian empires were often capitals or administrative centers (Blockmans & 't Hart 2013). These cities concentrated political, military, and commercial functions, but their economic success depended on the purchasing power of the royal court and other elites (Weber 1958, Blockmans & 't Hart 2013).

Even though the majority of the population in South Asia is likely to have been less well off than their European counterparts, elites had considerable resources due to the productivity of agriculture in the subcontinent (Jones 2003). How did South Asian elites live and spend? Unlike in Europe where the gentry lived in the countryside, South Asian nobility was concentrated in cities (Raychaudhuri & Habib 1982). One part of the nobilities' expenses had to be spent on the maintenance of their military—the salaries of the Mughal nobility was given for keeping their own contigents (Gilbert 2017). Military units, however, often required a retinue of service personnel, artisans, and merchants as well (Blake 1979). Furthermore, due to the ritual importance of conspicuous consumption the king and the nobility often had to engage in distributing gifts, financing festivals, constructing religious monuments to legitimate their rule (Bayly 1988). Maintaining troops and conspicuous consumption, therefore, proved to be important mechanisms for trade even in times of fragmentation.

In order to descriptively illustrate the relationship between capital cities and economic growth, I plot the location of urban growth clusters over time. Similarly to Cox (2017), I define cities as seeds if they are above the 75^{th} percentile both in their growth rate and their urban potential growth rate. This means that they are not only growing rapidly, but cities around them are also developing rapidly as well. If there are two seeds that are within 100 kilometres of each other, they are grouped together. I take the centroid of

the two seeds and I group with them all high performing cities that have above median growth rates and are within one degree of latitude and longitude of the centroid. Together seeds and high performers constitute a growth cluster.

Appendix Figures A.2 and A.3 describe the movement of inter-city growth clusters on the subcontinent. It is apparent that even if capital cities are not the fastest growing cities, they are spatially proximate to these high-performing cities. This relationship seems to disappear toward the end of the time period as the number of growth clusters and capital cities descreases. These trends are suggestive of the effect capital cities had on the growth of surrounding urban centers. It is likely that imperial centers did not only develop faster than other cities, but that they also provided markets for the products of other regions, which invigorated inter-regional trade.

To more rigorously examine the relationship between fragmentation, capitals, and growth, I regress economic growth on capital city status in Column (1) of Table 8. Capital cities are clearly important for economic growth: becoming a capital increases growth rate by over 500 percent (p-value < 0.001). To make sure that this large effect is not driven by outliers, I re-estimate the model without those observations that have a Cook's distance that is larger than three times the mean Cook's distance (Appendix Table B.1). While this somewhat reduces the significance (p-value $= 0.053$) and the coefficient size to a 123 percent increase in growth rate, capital city still remains a determinant of economic growth. As an additional robustness test I replace capital city status with administrative centers and I find that the effect size is quantitatively smaller, but similar in significance (Appendix Table B.2, Column (1)).[13] The large impact of capital cities on economic growth echoes the observations about the devastating effect on cities' economy of moving a capital and the enormous growth that being designated as a new capital conferred.[14]

[13]Administrative centers are only coded from the 17$^{\text{th}}$ century onwards. Administrative centers are capitals, Mughal provincial, *subah* headquarters, and capitals of princely states that are not identified as capital cities for the 19$^{\text{th}}$ century given the curtailed sovereignty that their rulers had.

[14]While some European travellers described the Mughal court as a moving encampment, only a portion of the capital's inhabitants were made up of soldiers (Ray 2016). On the other hand, South Asian rulers often tried to attract merchants, artisans, and servicemen to their capital cities. Abul Fazl, Akbar's prime minister recorded in the Mughal gazetteer that nearly 4,000 architects, skilled, and unskilled workers worked every day on the construction of the palace in Akbar's new capital, Fatehpur Sikri (Ray 2016). The number of workers is likely to have been much larger given that the Mughal aristocracy followed the movement of the emperor and constructed their houses near the palace (Ray 2016). Prior to becoming

This demonstrates that capital cities as consumer cities could grow faster than other cities. The question remains whether the practice of conspicuous consumption reduced the negative impact of political fragmentation on trade. In Column (2) of Table 8 I find that a higher number of polities leads to higher economic growth in capitals, but this effect is not significant. The coefficient on fragmentation itself remains negative and significant. When I break the sample to non-capitals and capitals, I find that the impact of fragmentation on trade relations was different for these two groups. In Column (3), while the correlation between growth and growth in urban potential is positive and significant for non-capitals, higher levels of fragmentation decreases this positive relationship. For capitals, on the other hand, the effect is the opposite. At higher levels of fragmentation, the correlation between growth and urban potential growth is positive, but with large standard errors this relationship is insignificant. Taken together, these results suggest that the negative effect of fragmentation on trade moves through cities that are less likely to have high levels of consumption.

A final concern could be capitals may be on differential growth trends from other cities. While the quantitative data does not allow me to disentangle this relationship within a particular century, there is considerable qualitative evidence to suggest that rulers were not choosing the largest cities as locations for their court. Capitals were often small towns or villages prior to becoming the center of imperial power. Rulers usually held practicalities in mind when establishing their capital such as access to fresh water or how defensible a particular location would be to outside attacks. Some also considered connecting their dynasty to former rulers: Shah Jahan decided to build his capital in Delhi, the capital of successive north Indian Muslim dynasties (Ray 2016). One of the chief reasons for establishing a new capital was overcrowding in a previous location where the imperial court was held or ensuring fresh water sources for the population (Ray 2016).

a capital, Fatehpur Sikri was not larger than a village, but the construction work and the movement of the Mughal court quickly attracted a large population. To stimulate trade, Akbar also ordered the setting up of markets and shops in Fatehpur Sikri and the establishment of a royal mint in the city, which allowed foreign merchants to exchange their coins to Mughal currency (Ray 2016). However, when a capital moved, it could quickly become abandoned. Accounts of European travellers who passed through Fatehpur Sikri after the death of Akbar illustrate the city's abandonment in absence of the Mughal court. William Finch, for example described the former capital as "all ruinate, lying like a waste desart, and very dangerous to pass through in the night, the building lying wast without inhabitants" (Foster 1921).

Akbar, one of the Mughal Emperors, following population growth in Agra decided to shift his capital to Fatehpur Sikri, a formerly unimportant village. In similar vein, Muhammad Quli Qutb Shah, the ruler of Hyderabad, shifted his capital from Golconda to avoid water shortages in the city (Ray 2016). Therefore, rulers often selected less densely populated areas as their new capitals rather than highly performing cities.

5 Conclusion

The impact of political fragmentation has been long studied in the European context, but scholars are just beginning to understand its consequences in other parts of the world (Blaydes & Paik 2019, Cox 2017, Ko et al. 2016). I argue that fragmentation's impact may differ by political geography and subsequent informal institutions. South Asian empires were vulnerable to invasions from Central Asian steppes. Invading groups frequently went on to establish new ruling dynasties. While initial military advantage translated to quick contests, rulers had to make alliances with local chiefs to maintain their rule. Alliance-making reduced internal conflicts within South Asia, but rulers traded off higher fiscal capacity for military support. Reliance on local chiefs also contributed to rulers' conspicuous consumption to indicate higher political and ritual status and legitimate their rule. As rulers needed luxury goods and the state's fiscal capacity remained low, merchants did not have to fear expropriations or high levels of taxation. Even in times of high fragmentation merchants could often pass on increased transaction costs to costumers.

In a novel dataset of South Asian fragmentation and city characteristics covering five centuries of pre-modern and colonial South Asia, I demonstrate that fragmentation had minimal impact in South Asia. The negative effect of fragmentation runs through exposure to violent conflict. Furthermore, I show that conspicuous consumption by royal courts likely mitigated the negative impact of fragmentation on trade. Taken together, these results suggest that South Asia's political geography, its vulnerability to external invaders establishing new states, contributed to alliance-making instead of widespread war and elite conspicuous consumption to legitimate political status. These factors mitigated

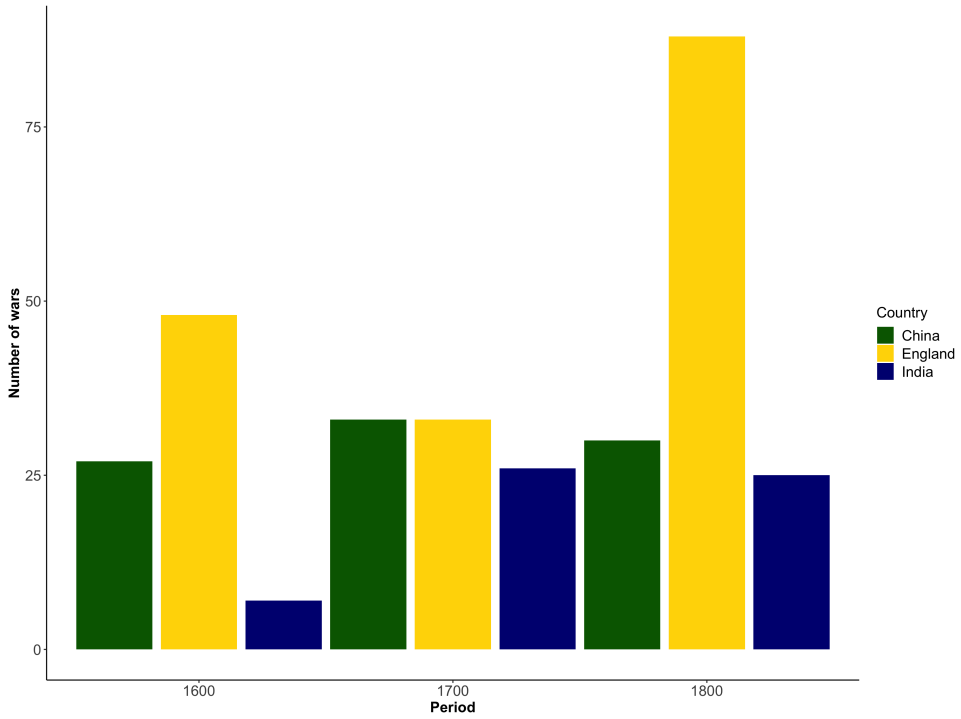
the negative effect of fragmentation on growth, but at the same time constrained ruler's impulses to extract more revenue, centralize their rule, and increase state capacity. All of which were possible reasons for South Asia's eventual colonization by Western European powers.

Why is South Asia's experience important for understanding sources of economic growth? While scholarship on pre-modern Europe has been successful in highlighting several factors that contributed to representative institutions or the Industrial Revolution, often the impact of these variables has not been examined rigorously in other contexts. Studying these factors in different regions can validate assumptions about their importance for Europe. One such factor is fragmentation. In learning about fragmentation, scholars have contrasted Europe with highly centralized and extractive empires that dominated other world regions. As the case of South Asia shows, however, there was significant diversity in levels of centralization and extractive capacity that Asian empires achieved.

The contribution of this study lies in quantitatively testing the impact of political fragmentation on economic growth in South Asia—a case that serves as a useful comparison to unified Chinese empires and fragmented Western Europe. The panel dataset of South Asian cities and polities enables comparisons across South Asia, the Middle East, and Europe owing to data collected by Bosker et al. (2013). Furthermore, the findings of this paper build upon prior research comparing the effects of political fragmentation, war, and trade on economic growth on different parts of Eurasia (Cox 2017, Jones 2003, Dincecco & Wang 2018, Blaydes & Paik 2019). This research differs from previous findings on fragmentation in emphasizing the role of informal institutions in reducing conflict and overcoming obstacles to trade (Greif 2006). As has been demonstrated by other political economy work on Eurasian societies, there is much to gain from comparing institutions for reducing violence and maximizing exchange across Western Europe and other world regions to understand the roots and obstacles to higher levels of growth or representative institutions (Blaydes & Chaney 2013, Kuran 2004).

6 Figures

Figure 1: Total Number of Wars in China, India, and England by Century



Note: Based on Gupta et al. (2016)

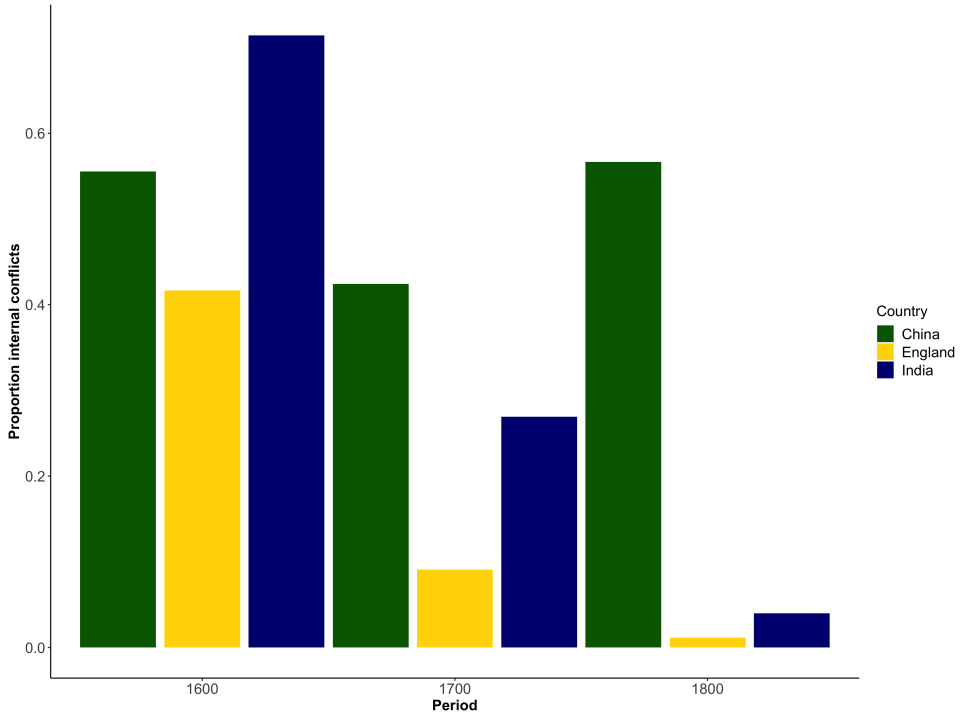


Figure 2: Number of Internal Wars in China, India, and England by Century

Note: Based on Gupta et al. (2016)

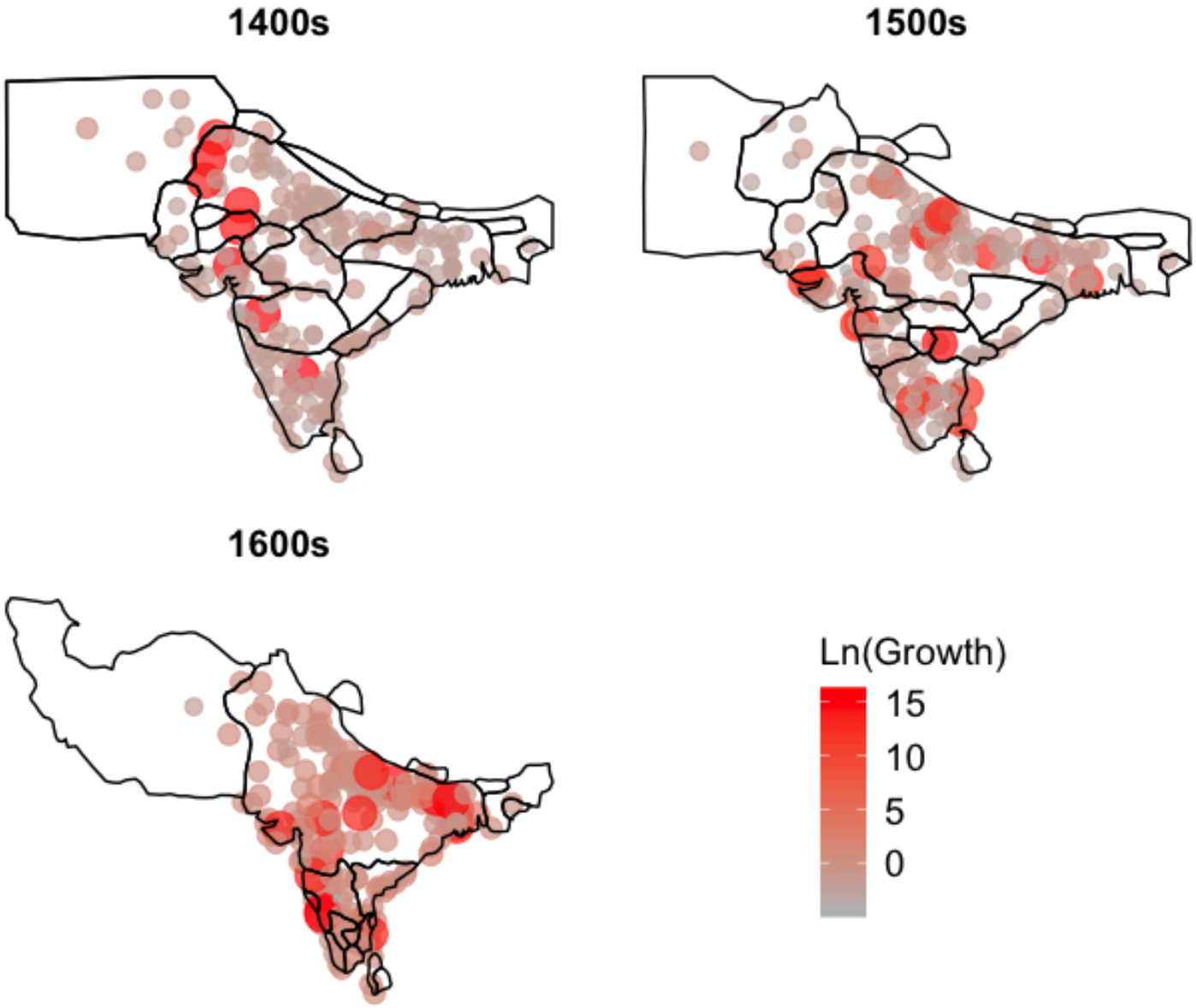


Figure 3: Political Fragmentation and City Growth, 1400-1699

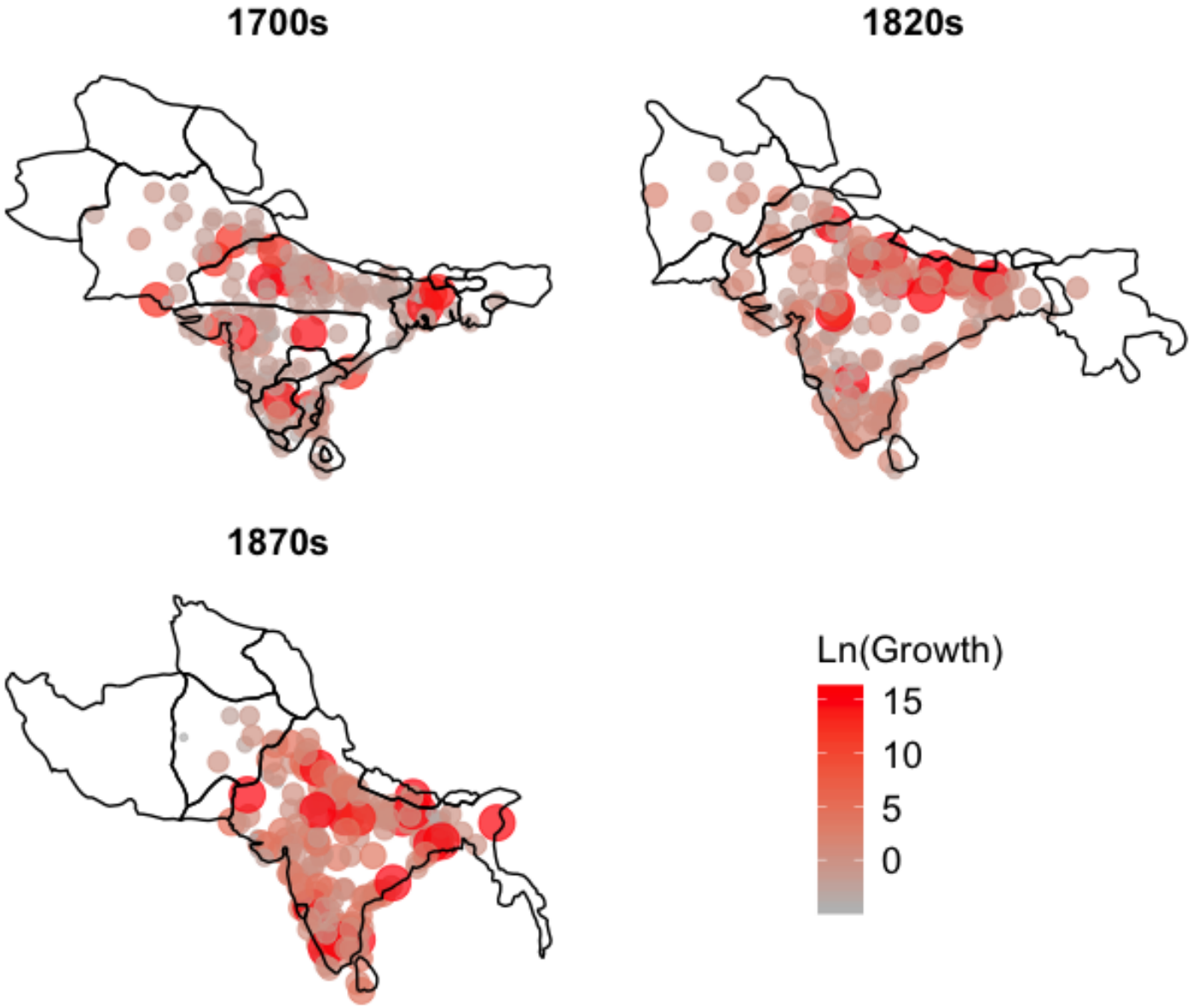


Figure 4: Political Fragmentation and City Growth, 1700-1899

Figure 5: **Number of battles in the previous century and number of polities**

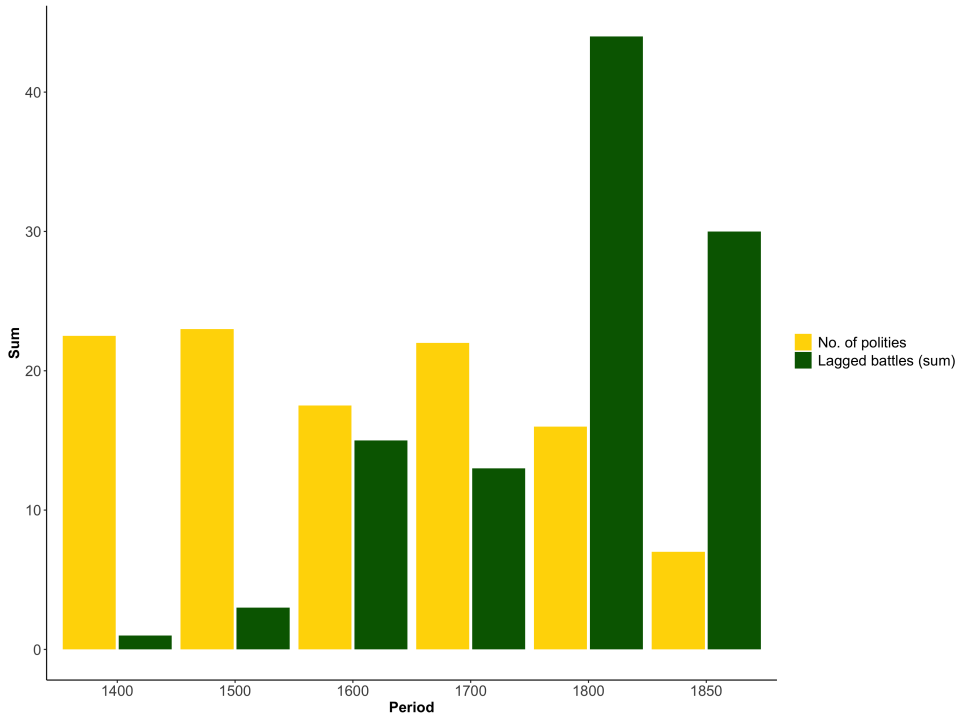
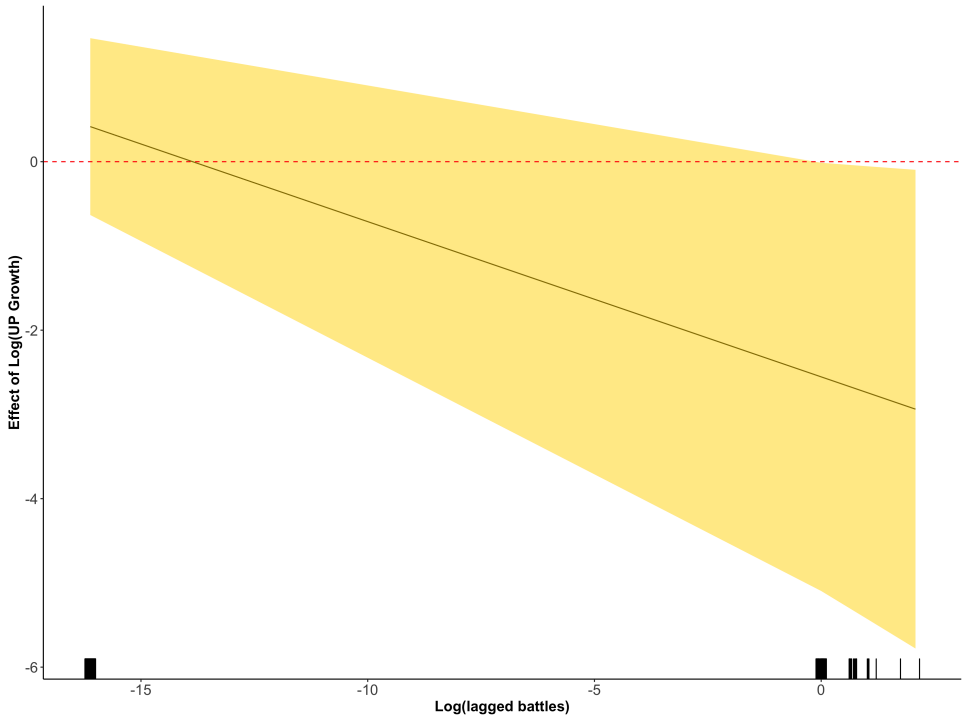


Figure 6: **Log(UP) Correlations as a Function of Battle Exposure**



7 Tables

Table 1: Timeline of Events in Study Period

1400-1500	North: Central Asian Turks invade North India establish successive dynasties that rule North India. .
1400-1500	South: The powerful Vijayanagara Empire rules much of the southern part of the subcontinent. .
1600-1707	North: Expansion of the Mughal Empire.
1600-1707	South: Vijayanagara empire collapses, regional kingdoms, arrival of EIC.
1700-1750	Collapse of the Mughal Empire, Maratha invasion from West, Afghan invastion from NW.
1773	EIC rule in Bengal.
1780-1850	Expansion of EIC rule over the subcontinent.
1857	Mutiny / War of Independence.
1857-1947	British Crown directly rules over the subcontinent.

Table 2: Descriptive Statistics

variable	mean	sd	min	max
Population (upper bound)	29.50	53.09	0.00	726.06
Population (lower bound)	23.59	54.92	0.00	726.06
Ln(Pop. growth)	1.15	4.01	-4.66	16.81
No. polities	18.00	5.58	7.00	23.00
No borders w/in 100km	1.43	0.59	1.00	4.00
Trade road fragm	3.41	2.18	1.00	10.50
Riverine (0/1)	0.59	0.49	0.00	1.00
Coastal (0/1)	0.15	0.36	0.00	1.00
On navigable river (0/1)	0.16	0.37	0.00	1.00
On trade road (0/1)	0.31	0.46	0.00	1.00
Elevation	269.80	332.47	-1.35	2183.10
Capital	0.15	0.35	0.00	1.00
Ln(Growth in urban pot.)	0.31	0.32	-1.04	1.85
Battles, t-1 (0/1)	0.06	0.24	0.00	1.00

Table 3: **Effect of Fragmentation on Economic Growth**

Dependent variable:	log*(Growth)*			
	(1)	(2)	(3)	(4)
No. polities	-0.059**	-0.125**	-0.142**	-0.142**
	(0.025)	(0.060)	(0.059)	(0.059)
Capital			1.984***	1.984***
			(0.540)	(0.539)
Ln(UP Growth)				-0.006
				(0.646)
N	1212	1212	1212	1212
City FE	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. The dependent variable for all cases is the natural logarithm of city's population growth rate. The independent variable in column (1) is the total number of polities. Since the total number of polities varies by time but not with city, I do not include period fixed effects. Columns (2)-(4) includes period-specific controls. Heteroskedastic standard errors are clustered at the city-level.

Table 4: **Effect of Number of Borders on Economic Growth**

Dependent variable:	log*(Growth)*			
	(1)	(2)	(3)	(4)
No. borders	0.141	0.049	-0.036	-0.037
	(0.219)	(0.233)	(0.232)	(0.232)
Capital			1.936***	1.936***
			(0.534)	(0.535)
Ln(UP Growth)				0.174
				(0.737)
N	1206	1206	1206	1206
City FE	Yes	Yes	Yes	Yes
Period FE	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. The dependent variable for all cases is the natural logarithm of city's population growth rate. The independent variable is the average number of borders for period t for city i. Columns (2)-(4) includes period-specific controls. Heteroskedastic standard errors are clustered at the city-level.

Table 5: **Effect of Trade Road Fragmentation on Economic Growth**

Dependent variable:	log*(Growth)*			
	(1)	(2)	(3)	(4)
Trade road fragm.	-0.116	-0.102	-0.162	-0.134
	(0.247)	(0.245)	(0.235)	(0.228)
Capital			3.034***	3.048***
			(0.972)	(0.952)
Ln(UP Growth)				2.415**
				(1.088)
N	486	486	486	486
City FE	Yes	Yes	Yes	Yes
Period FE	No	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. The dependent variable for all cases is the natural logarithm of city's population growth rate. The independent variable is the number of polities on the trade road segment that is within 50 kilometres of a city. Columns (2)-(4) include period-specific controls. Heteroskedastic standard errors are clustered at the city-level.

Table 6: **Effect of Fragmentation on Economic Growth (Northern Cities Only)**

Dependent variable:	log*(Growth)*		
	(1)	(2)	(3)
No. polities	-0.129*		
	(0.068)		
No. borders w/in 100km		0.044	
		(0.325)	
Trade road fragm			-0.327
			(0.296)
N	912	906	366
City FE	Yes	Yes	Yes
Period FE	No	Yes	Yes
Controls	Yes	Yes	Yes

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. The dependent variable for all cases is the natural logarithm of city's population growth rate. The independent variable in column (1) is the total number of polities. Since the total number of polities varies by time but not with city, I do not include period fixed effects only period-specific controls. For column (2) the independent variable is the average number of borders for period t for city i. For column (3) the independent variable measures the number of polities on the trade road segment that is within 50 kilometres of a city. Heteroskedastic standard errors are clustered at the city-level.

Table 7: **Effect of Battles on Growth**

Dependent variable:	log*(Growth)*		
	All cities		*post-1700*
	(1)	(2)	(3)
Lagged battle exposure	-0.140	0.825	1.676
	(0.610)	(0.957)	(1.362)
Log(UP Growth)	0.191	0.420	1.610
	(0.722)	(0.720)	(1.224)
Lagged battle exp X Log(UP Growth)		-3.051*	-4.291**
		(1.752)	(2.104)
N	1212	1212	606
City FE	Yes	Yes	Yes
Period FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. The dependent variable for all cases is the natural logarithm of city's population growth rate. The main independent variable in column (1) is a binary indicator of whether the city was exposed to a battle in the prior century. Columns (2) and (3) also control for a city's growth in urban potential and the interaction of growth in urban potential and battle exposure. The sample of cities in column (3) is restricted to the 18^{th} and 19^{th} centuries. Heteroskedastic standard errors are clustered at the city-level.

Table 8: **Capital Cities, Trade, and Fragmentation**

Dependent variable:	log*(Growth)*			
	All cities		*Non-capitals*	*Capitals*
	(1)	(2)	(3)	(4)
Capital	1.905***	-0.294		
	(0.524)	(1.756)		
Log(UP growth)	0.200	0.216	8.228**	-25.570
	(0.728)	(0.729)	(3.865)	(30.082)
No. polities		-0.151**	0.091	-0.450
		(0.066)	(0.131)	(0.797)
Capital X No. polities		0.108		
		(0.087)		
Log(UP Growth) X No. polities			-0.423**	1.269
			(0.195)	(1.383)
N	1212	1212	1033	179
City FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. The dependent variable for all cases is the natural logarithm of city's population growth rate. The main independent variable in column (1) is a binary indicator of whether a city was a capital city in a given period. Columns (2) introduces the independent effect of political fragmentation and the interaction between fragmentation and capital city status. Columns (3) and (4) controls for a city's growth in urban potential and the interaction of growth in urban potential and fragmentation. The sample of cities in column (3) is restricted to non-capitals and in column (4) to capitals. Heteroskedastic standard errors are clustered at the city-level.

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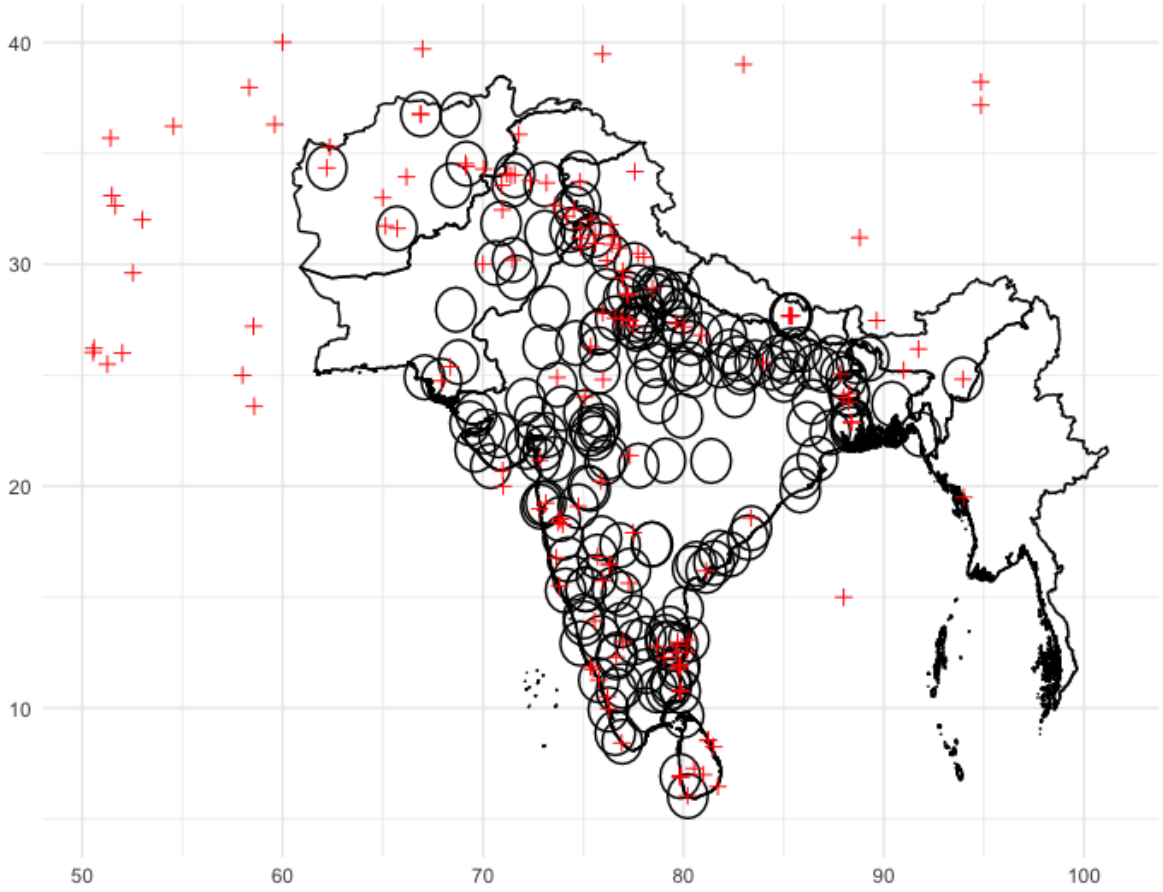
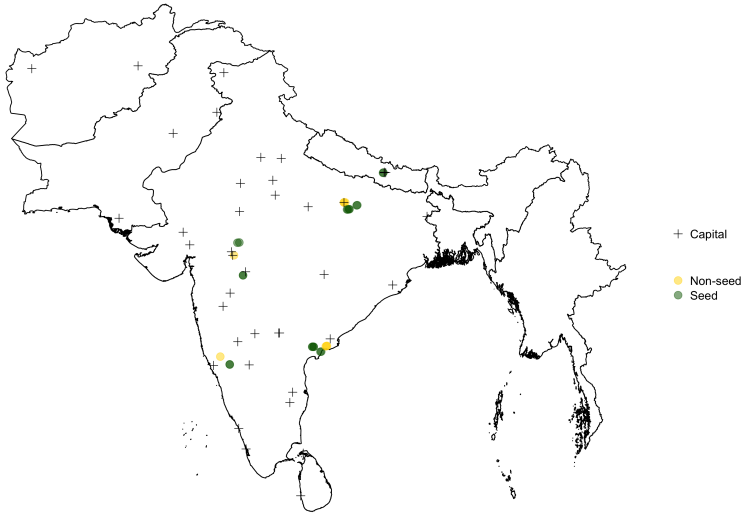
A Appendix Figures

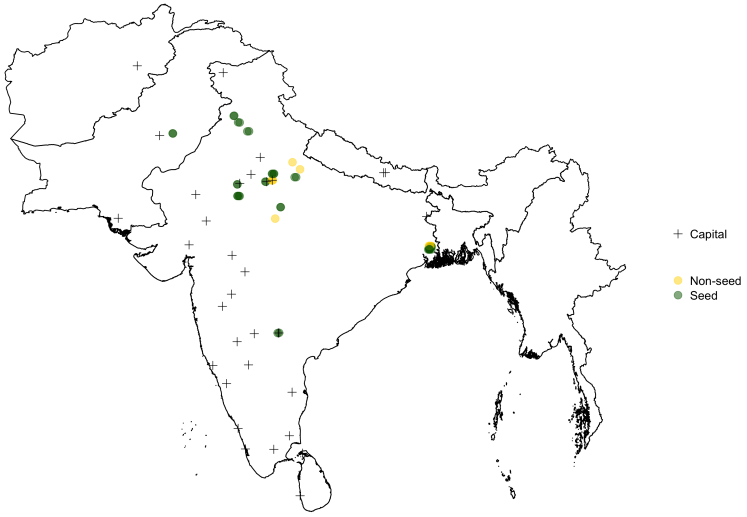
Figure A.1: **Distribution of Military Battles in South Asia, 1400-1900**



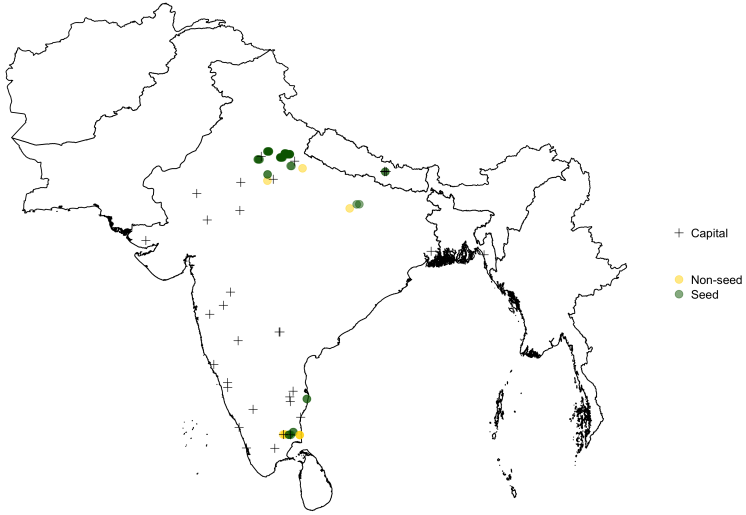
Note: Circles in the figures represent the 100 km radius of each city. Crosses represent battles. Current country boundaries are shown.



(a) 15th century

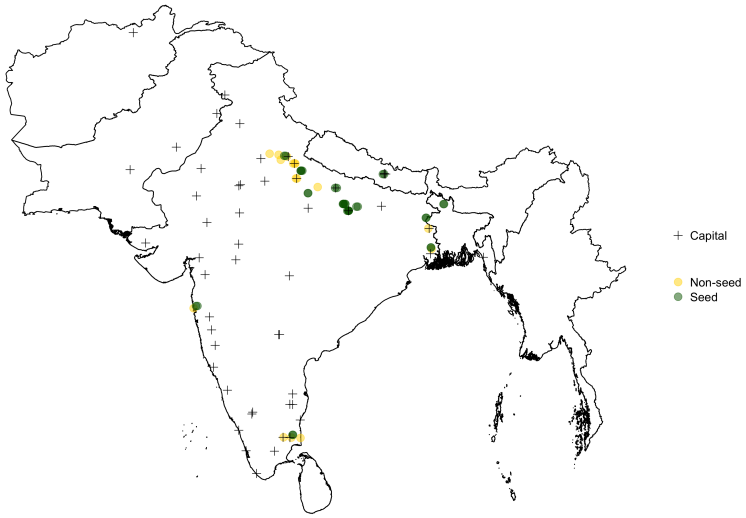


(b) 16th century

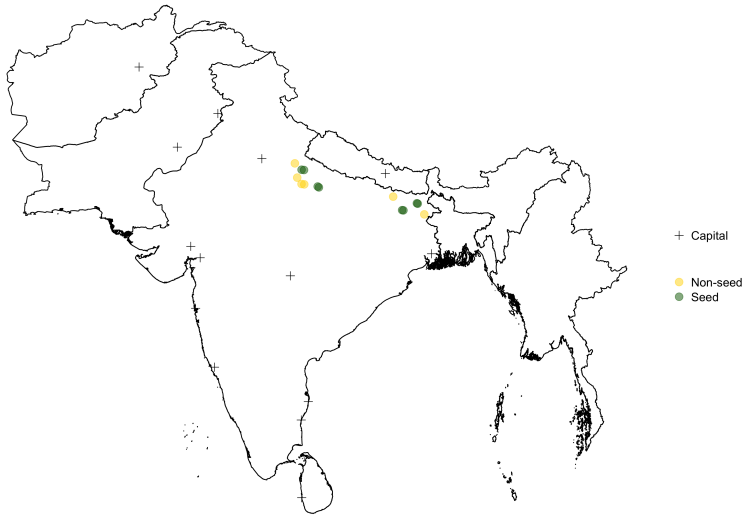


(c) 17th century

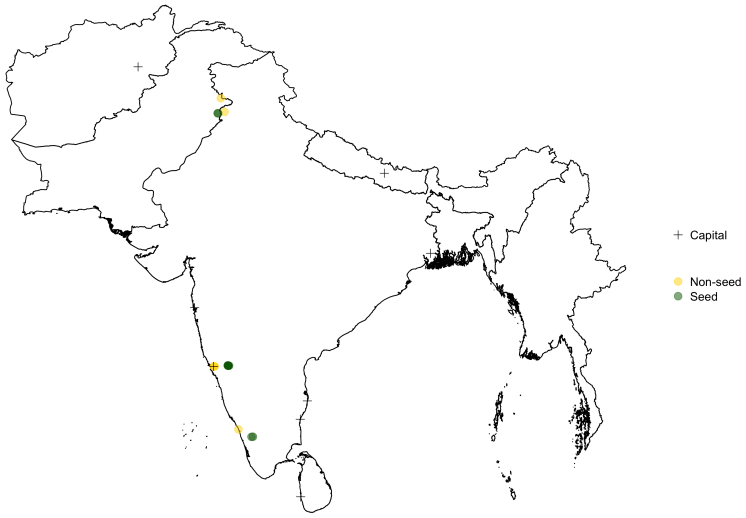
Figure A.2: Growth Clusters and Capitals in South Asia, 1400-1699



(a) 18$^{\text{th}}$ century



(b) Early 19$^{\text{th}}$ century



(c) Late 19$^{\text{th}}$ century

Figure A.3: Growth Clusters and Capitals in South Asia, 1700-1899

B Appendix Tables

Table B.1: **Capital Cities, Trade, and Fragmentation (without Outliers)**

Dependent variable:	log*(Growth)*			
	All cities		*Non-capitals*	*Capitals*
	(1)	(2)	(3)	(4)
Capital	0.803*	0.758		
	(0.412)	(1.363)		
Log(UP growth)	-0.183	-0.214	2.716	-19.000
	(0.636)	(0.638)	(3.044)	(15.382)
No. polities		-0.083*	-0.067	-0.376
		(0.045)	(0.097)	(0.490)
Capital X No. polities		-0.004		
		(0.063)		
Log(UP Growth) X No. polities			-0.123	0.877
			(0.155)	(0.713)
N	1108	1109	919	155
City FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. The sample of cities includes those that have a Cook's distance that is lower than three times the mean Cook's distance when I estimate the regression with all observations. The dependent variable for all cases is the natural logarithm of city's population growth rate. The main independent variable in column (1) is a binary indicator of whether a city was a capital city in a given period. Columns (2) introduces the independent effect of political fragmentation and the interaction between fragmentation and capital city status. Columns (3) and (4) controls for a city's growth in urban potential and the interaction of growth in urban potential and fragmentation. The sample of cities in column (3) is restricted to non-capitals and in column (4) to capitals. Heteroskedastic standard errors are clustered at the city-level.

Table B.2: **Administrative Centers, Trade, and Fragmentation**

Dependent variable:	log*(Growth)*			
	All cities		*Non-admin*	*Admin*
	(1)	(2)	(3)	(4)
Admin. center	1.255**	-1.944		
	(0.602)	(1.441)		
Log(UP growth)	-0.210	-0.143	13.322**	4.756
	(1.027)	(1.009)	(5.574)	(15.325)
No. polities		-0.258**	0.029	0.572
		(0.104)	(0.243)	(0.603)
Amin X No. polities		0.196**		
		(0.085)		
Log(UP Growth) X No. polities			-0.709**	-0.547
			(0.289)	(0.811)
N	808	808	542	266
City FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Notes: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. The sample of cities only includes observations post-1600. The dependent variable for all cases is the natural logarithm of city's population growth rate. The main independent variable in column (1) is a binary indicator of whether a city was an administrative center in a given period. Columns (2) introduces the independent effect of political fragmentation and the interaction between fragmentation and administrative center status. Columns (3) and (4) controls for a city's growth in urban potential and the interaction of growth in urban potential and fragmentation. The sample of cities in column (3) is restricted to non-administrative centers and in column (4) to administrative centers. Heteroskedastic standard errors are clustered at the city-level.

Cities of Princes and Merchants

Data Appendix

Aliz Tóth

This section is to explain the coding strategy for the different variables included in the dataset of South Asian cities from 1600 to 1900. The dataset is currently not available, but will be made publicly available upon publication.

Political Status I rely on the Historical Atlas of South Asia 1978 (Schwartzberg Atlas hereafter). The Schwartzberg Atlas has been used in other studies on historical South Asia to identify medieval temple locations (Iyer et al. 2017). If a city is identified in the Schwartzberg Atlas as the capital of a sovereign state, any of the British Presidencies (Bombay, Madras, or Bengal), or other colonial powers (French or Portuguese) I code it as a capital. From 1800 onwards, I do not code capitals of princely states as capitals given that these states largely became tributaries to the East India Company and could not conduct policy independently (Bayly 1988). I code all capitals as an administrative center as well for all time periods. Additionally, for the 17^{th}-18^{th} centuries I code a city as an administrative center if it was a provincial headquarter within the Mughal Empire and identified either in the Schwartzberg Atlas or in the Mughal gazetteer, *Ain-i-Akbari*. Administrative centers were headquarters of larger provinces, called *subahs*, or districts within these provinces, called *sarkars*. For the 19^{th} century I code a city as an administrative center if it is identified as a capital of major provinces within the British Raj or of a princely state in the Historical Atlas of South Asia.

Political Fragmentation To account for both effects of fragmentation and make sure that results are not dependent on any one, I use several measures.

Number of Polities For each time period I note the average number of sovereign states on the subcontinent that are identified in The GeaCron Project. GeaCron is an online world history atlas that provides the most comprehensive geo-temporal information about polities and their boundaries across the world from 3000 BC until today. It can be accessed at `www.geacron.com`. GeaCron identifies polities and their boundaries for each year across the world. I narrow the focus of the atlas to the modern day countries that include cities in my dataset. For every decade I count the number of polities in the region. I calculate the average number of polities for each time period. It is likely that GeaCron underestimates the number of polities for any period, the number of polities using this measure is consistently lower than using the Schwartzberg Atlas.

Number of Nearby Borders I also rely on polity boundaries in South Asia identified by The GeaCron Project. The real advantage of the GeaCron Project is that it allows me to use the digitized political borders to calculate how far a merchant would have had to travel from a particular city to reach another polity. First the digitzed borders for 1400 to 1900 were mapped in QGIS for each 50 year period. Then every city in the dataset was also mapped with a 100 km radius buffer drawn around it. Then the two shapefiles were joined to identify the number of intersections between individual city buffers and unique

polity borders. This yields the average number of borders around a city for each time period.

Fragmentation on Trade Roads I have digitized the major overland trade routes in South Asia identified in (**?**). I overlay the map of polity borders on trade routes to identify the number of polities that merchants had to cross while travelling on a trade route.

Riverine Location I use the geographical coordinates of all cities in my dataset given in Reba et al. (2016). Next these points were mapped in the geospatial software, QGIS along with river bodies of Afghanistan, Pakistan, India, Nepal, Bangladesh, and Sri Lanka. Whenever a river body was in 5 kilometer proximity of a city, the city was coded as riverine.

Coastal Location Similarly to coding riverine location I use the geographical coordinates of all cities in my dataset given in Reba et al. (2016). Next these points were mapped in the geospatial software, QGIS along with the coastline of Afghanistan, Pakistan, India, Nepal, Bangladesh, and Sri Lanka. Whenever a river body was in 5 kilometer proximity of a city, the city was coded as riverine.

Elevation For identifying the elevation of each city, I give the coordinates of the city to the `google_elevation` function in the statistical software `R` to get elevation from Google Earth.

Navigable Rivers and Trade Routes The Atlas of the Mughal Empire by Irfan Habib has been referred to trace navigable rivers and trade routes. The economic maps of the following regions have been used to trace the cities – Central India, Deccan East, Deccan West, Gujarat, Kashmir, Mughal Empire, North Afghanistan, Orissa, Punjab, Rajasthan, Sind, South Afghanistan, South India and Uttar Pradesh. Numbers of navigable rivers that pass through a city have been identified with the sign that codes 'Navigable, & Tonnage of largest boat/vessel' on the map and marked against that particular city. The code 'Route' on the maps has been used to identify the trade route that passes through a particular city. The trade routes are marked in binary i.e. the cities having trade routes passing through them has been coded as 1 and cities that do not have any trade route passing through them have been coded as 0.

Railway line The Survey of India 1919, India Showing Railways by John R. Borchet Map Library, University of Minnesota Library has been refereed to trace whether a city has navigable railway track passing through it. Only those cities that had 'open' railway tracks have been coded as 1. Those which had 'sanctioned or under construction' tracks have been coded as 0.

City establishment date The foundation of each city's date was identified using several sources including The Gazetteer of the Territories Under the East India Company, the Imperial Gazetteer of India, 1901, and in some cases Wikipedia.

Exposure to battles I use battle location and date in South Asia identified in the DBPedia Project that maps all conflicts identified in Wikipedia. It can be accessed at `http://dbpedia.org/ontology/battle`.