

## Ying Bai and Ruixue Jia When History Matters Little: Political Hierarchy and Regional Development in China, AD 1000–2000

1910, 1964, and 2000). We find that gaining provincial capital status has a large and positive effect on local economic development, which may not be surprising. A less obvious and more interesting question is whether the economic advantages of capital prefectures still hold after losing capital status. One hypothesis is that losing status matters little because the relocation of economic activity is costly as argued by the path dependence literature mentioned above; the other is that “history matters little” if some players have incentives to incur the fixed costs of relocation, as formalised by Rauch (1993). Empirically, we find support for the latter, even although the relocation decision is mainly driven by political reasoning, rather than economic optimisation. When discussing underlying factors, we find that not only public offices, but also important production factors like human capital and transportation networks alter their geographical location with the change in provincial capital status.

### REGIME CHANGES AND PROVINCIAL CAPITAL RELOCATION

As the largest enduring state with a distinctive political hierarchy, China provides a particularly advantageous context for understanding how politics affect economic geography. On the one hand, China underwent six dynastic regime changes during AD1000-2000 that brought about drastic shifts in boundaries and centers of power, with national capitals relocated five times and the method for dividing provinces amended from relying on natural geographical barriers (known as

In AD 1000, Kaifeng was the most prosperous city in China and, with an estimated population of one million, arguably the largest city in the world. By 2015, however, its GDP ranked 129th among Chinese cities and its former glory was long forgotten. Kaifeng's decline is closely related to its status in the political hierarchy, after first losing political prestige as the national capital in the thirteenth century, and subsequently its status of provincial capital in the twentieth century. Kaifeng is just one of many cases of a city whose economic status rises and falls with its position in the political hierarchy in China.

In Bai and Jia (2018), we attempt to understand this politico-economic link by tracing the evolution of provincial capitals and the spatial distribution of economic activity in China from AD1000 to 2000. By documenting changes in economic activity, we complement existing literature focusing on the persistence in economic activity due to locational fundamentals (pioneered by Davis and Weinstein 2002), or the persistent impacts of temporary advantages (exemplified in Bleakley and Lin 2012). By exploiting changes in political status and uncovering some mechanisms, we extend the research relying on cross-sectional variation to understand how politics shapes economic geography (e.g., De Long and Shleifer 1993). Moreover, by investigating when history matters little, we can also better understand why history matters (see Nunn 2009 for an overview): whether the state (or another player) has incentives and the capacity to overcome inertia in the location of economic activity is an important predictor for whether history matters.

Using data from existing historical and modern censuses, we construct a panel dataset across 261 prefectures for 11 periods (980, 1078, 1102, 1393, 1580, 1776, 1820, 1851,

Figure 1  
Hierarchical Distance and Location of Provincial Capitals in the Ming Dynasty

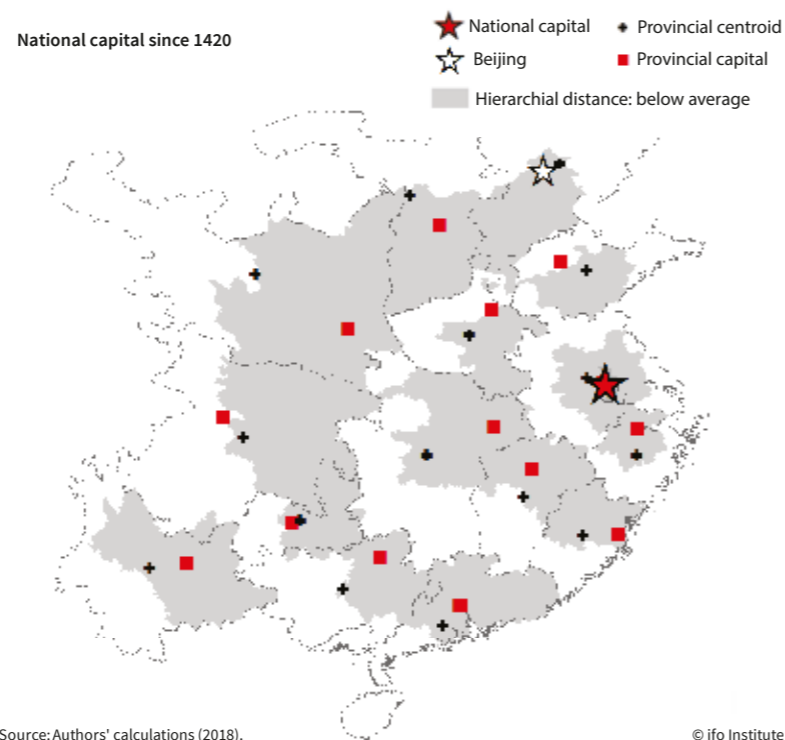
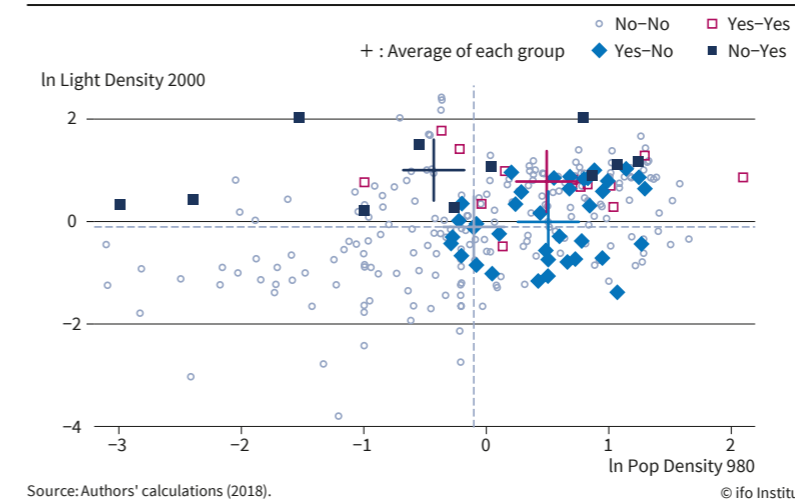


Figure 2  
Population Density in 980 vs. Night Light Density in 2000



“siting [i.e., following] the forms of mountains and rivers” to intentionally including the natural barriers within provinces, so that boundaries “interlocked like dog's teeth”). Consequently, 63 out of the 261 prefectures defined by the 2000 boundaries were once a provincial capital whose status changed with a new regime. On the other hand, despite regime changes, China's political hierarchical system remained surprisingly stable, where the central government in each regime ruled the vast country by using a three-tier administrative system (province-prefecture-county) and monopolising the power of appointing, reshuffling and removing local officials for each tier. Thanks to its enduring administrative system, China has a long history of governmental censuses whose rich information on population, geography, infrastructure, and bureaucracy allow us to trace the changes in capital status, construct extensive prefecture-level data over time, and examine how both gaining and losing importance in the political hierarchy matters for a prefecture's development.

### THE POLITICAL LOGIC OF PROVINCIAL CAPITAL LOCATION

Provincial capitals serve two important roles: they are (1) administrative centres for provincial affairs, and (2) important nodes through which the central government connects with a large number of localities throughout the country to collect/distribute resources and information. Two costs thus become important for the location of a capital for a province: the cost of collecting resources and information within a province and that of delivering some part of them to the national center. Empirically, we can proxy the first part by a prefecture's distance to other prefectures within the same province and the second part by a prefecture's distance to the national capital. We then define the weighted sum of the two distances as “hierarchical distance” and show a prefecture's rank in hierarchical distance within

a province to be a strong predictor of its capital status.

Intuitively, the algorithm of hierarchical distance implies that the provincial capitals deviate from the provincial centroid toward the direction of the national capital. To see this logic, we map the location of provincial capitals regime-by-regime. Figure 1 presents the Ming dynasty as an example to illustrate the logic.

### THE IMPORTANCE OF GAINING AND LOSING PROVINCIAL CAPITAL STATUS

As a descriptive pattern, we first look at the 980 and 2000 data, a two-period structure that allows us to depict the main pattern by categorising the prefectures into four groups: (1) capitals in both periods, denoted by “yes-yes”, (2) capitals in 980 but not in 2000, denoted by “yes-no”, capitals in 2000 but not in 980, denoted by “no-yes”, and (4) not capitals in either period, denoted by “no-no”.

In Figure 2, the x-axis indicates the standardised logged population density in 980, while the y-axis indicates the standardised logged night light density in 2000. The data reveal systematic changes as indicated by the four crosses in Figure 2:

An average “no-yes” prefecture was 0.3 standard deviations below the mean in 980, but transitioned to one standard deviation above the mean in 2000, indicating that gaining capital status is correlated with better economic development.

An average “yes-no” prefecture was 0.5 standard deviations above the mean and comparable to a “yes-yes” prefecture in 980 (when both were provincial capitals), but it nears the mean and is similar to a “no-no” prefecture in 2000 after losing capital status (i.e., its capital status in 980 does not determine its level of economic development in 2000).

Analogous to the analysis above, we can divide the prefectures into four groups every two regimes. This way, we can further visualise the four groups period by period. To compare prefectures with similar characteristics, we first regress the log population density on all of the prefecture characteristics — its geographical variables, including whether a prefecture contains a plain or major river or is on the coast, as well as its slope, elevation, longitude, and latitude, its agricultural variables, including five types of crop suitability, and its macroregion dummies — and obtain the residuals. We then plot the average residuals for the four groups period-by-period (relative to the time of status change) in Figure 3, which again shows systematic changes:

The gaining group (i.e., the “no-yes” prefectures) is similar to its “no-no” peer group before the status

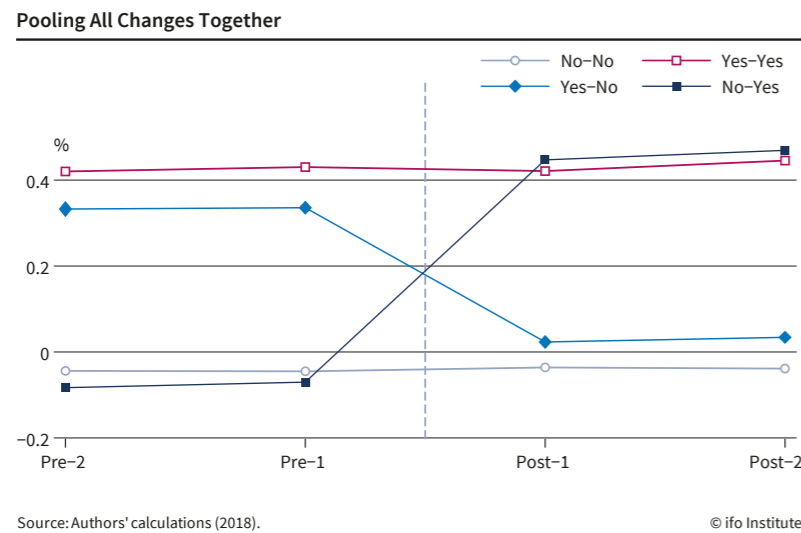


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Figure 3



change, but it becomes 48% higher than its “no-no” peer group after gaining capital status;

The losing group (i.e., the “yes-no” prefectures) is about 38% higher than its “no-no” peer group before the status change, but it becomes comparable to the “no-no” peer group after losing capital status.

In Bai and Jia (2018), we examine these patterns more systematically using three approaches: difference-in-differences analysis, an instrument variable approach guided by the algorithm mentioned above (i.e., hierarchical distance), and a matching method. We find the change in capital status is associated with a 40-50% change in population density. Moreover, both the increase and the decrease in population density occur only after gaining and losing capital status. Due to the low frequency of data, we cannot say the exact number of years that it will take for the effects to occur, but the data tell us that they occur within 75 years after a status change. These results are robust to considering lagged population (to deal with mean reversion), controlling for war shocks (which are orthogonal to our instrument), using urbanisation as an alternative outcome, and employing grid-level data. When dividing our data over time according to major technological shocks in the millennium, we find that capital status change matters generally, despite technological progress. If anything, the change in capital status appears to matter even more after 1910.

**UNDERLYING FACTORS**

What, then, explains the link between political hierarchy and regional economic development? Many factors change along with a prefecture’s political status. Due to the difficulty of enumerating each factor in history and the current age, we focus on certain factors guided by answering two questions important for interpreting our findings. Firstly, is our finding purely driven by public employment (and a possible multiplier effect)? The

answer to this question has implications for whether we can consider the provincial capitals as consumption-intensive “parasite cities.” Secondly, since fixed costs are important for explaining path dependence, is there any evidence that some player incurs the fixed costs?

We first conduct some back-of-envelope analysis using modern data on occupation and discuss the role of public employment (and a possible multiplier effect). Then, we move to human capital, partly because it is an important production factor, and partly because we can

build a panel dataset to examine the impact of capital status change. Finally, we focus on transportation networks across regimes, which are among the most important infrastructure provided by the state.

*Public Employment:* We find that public employment is indeed part of the channels. But since the aggregate share of public employment in the population accounts for around 3-4% of the population, it is difficult for this channel alone to explain a large part of our baseline finding. One may further argue that the spillover effect of public employment on private employment in China is particularly large. We cannot directly measure the multiplier over time. However, this argument implies a decreasing impact of capital status change over time, because the demand was likely to be more concentrated in capital prefectures in the more distant past, which is not the case in the data.

*Change in Human Capital:* We would like to examine human capital for three reasons. Firstly, existing studies have documented that human capital exhibits persistence. If we find that human capital varies systematically with political status, it illustrates the importance of political hierarchy in shaping economic factors. Secondly, it is useful to know whether talents move with capital status. If they do, it suggests that the impact of capital status change not only concerns public employment and rent-seeking activity. Finally, it is one of the few important factors we can measure across regimes.

Education in China is historically governed by the imperial examination system (ca. AD605-1905). To measure human capital in history, we employ the number of presented scholars (the highest degree in the imperial examination, known as *Jinshi* in Chinese) in the Qing dynasty. For modern human capital, we use the number of individuals with high school education and above. We normalise the former by population size

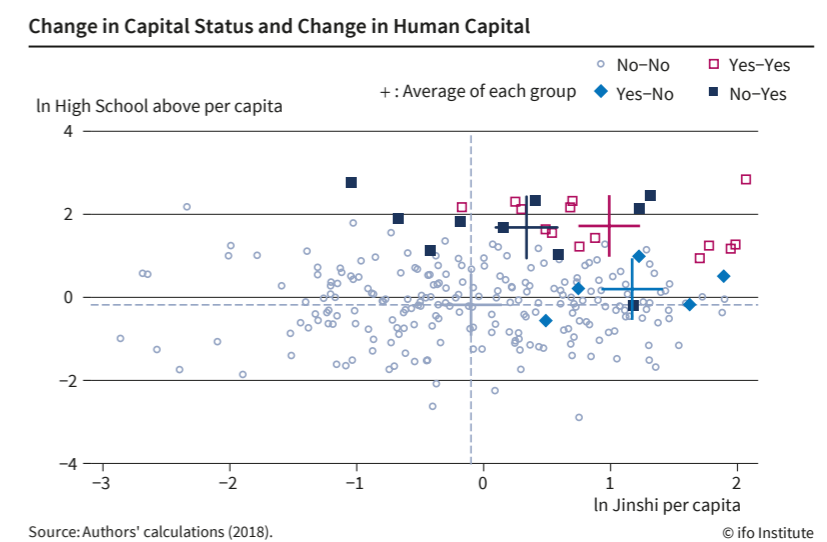
in 1776 (mid-Qing) and the latter by population size in 2000. In line with our descriptive pattern in Figure 2, we divide all the prefectures into four groups based on a prefecture capital status in the Qing and in 2000 (“No-No”, “Yes-Yes”, “Yes-No”, and “No-Yes”). Figure 4 illustrates the pattern, where the x-axis indicates the standardized log *Jinshi* per capita in history, and the y-axis indicates the standardised log individuals with high school or above per capita in 2000. These two measures are positively correlated, indicating some persistence of human capital. However, we also observe that human capital varies systematically within gaining and losing capital status. For instance, those gaining capital status (the “No-Yes” group) are similar to the “Yes-Yes” group in 2000 in terms of modern human capital, even although they were at lower level in the Qing dynasty. By contrast, those losing capital status (the “Yes-No” group) were comparable to the “Yes-Yes” group in the Qing dynasty (when both were capitals), but performed more poorly in 2000, and became more comparable to the “No-No” group.

*Change in Transportation Networks:* We are interested in transportation networks for reasons similar to those discussed with regard to human capital. On top of these reasons, transportation networks are critical for the state to collect resources and information. Throughout history and up until the present day, the Chinese state has been the largest single investor in transportation and communications facilities. Therefore, by examining the transportation networks, we can gain a better understanding of the role of the state in relocating economic activity.

To assess how transportation networks vary with capital status, we digitise roads and waterway maps for three historical periods (represented by specific years) -- the Song (1078), Ming (1587), and Qing (1820) dynasties-- and the railroad map for the People’s Republic (1990). Figure 5 presents these transportation networks over time.

Empirically, transportation networks experience major changes across regimes for two sets of reasons. Firstly, it is costly to maintain routes. Due to the lack of maintenance, many land routes disappear; several parts of the Grand Canal were ruined for a long period (Brook 1998). Secondly, when a regime replaced the previous one, the ruler decided which parts of the transportation networks needed to be reconstructed, which probably depended on the prefectures’ relative importance in the political hierarchy. Even if some of

Figure 4



the old routes were kept, a prefecture’s centrality in the network was altered by the reconnected or newly-built routes. As a result, the regime change in China provides us with a rare opportunity to systematically investigate changes in the transportation networks.

As already suggested by Figure 5, provincial capitals appear to be the hubs in transportation networks. Empirically, we employ a centrality measure to proxy the spatial importance of different prefectures over time. In line with our baseline outcome, we find that gaining provincial capital status increases centrality, whereas losing capital status implies a loss of centrality. Again, when examining the correlation between capital status and centrality, we find that centrality decreases (increases) only after the loss (gain) of capital status.

These findings show that even transportation networks vary with the political hierarchy. Together with our results on human capital, we find that the impact of capital status change is not limited by public employment. Instead, production factors are also affected. Moreover, since transportation networks are among the most important types of infrastructure, our finding also suggests that the state plays an important role in bearing the fixed cost of relocating economic activity.

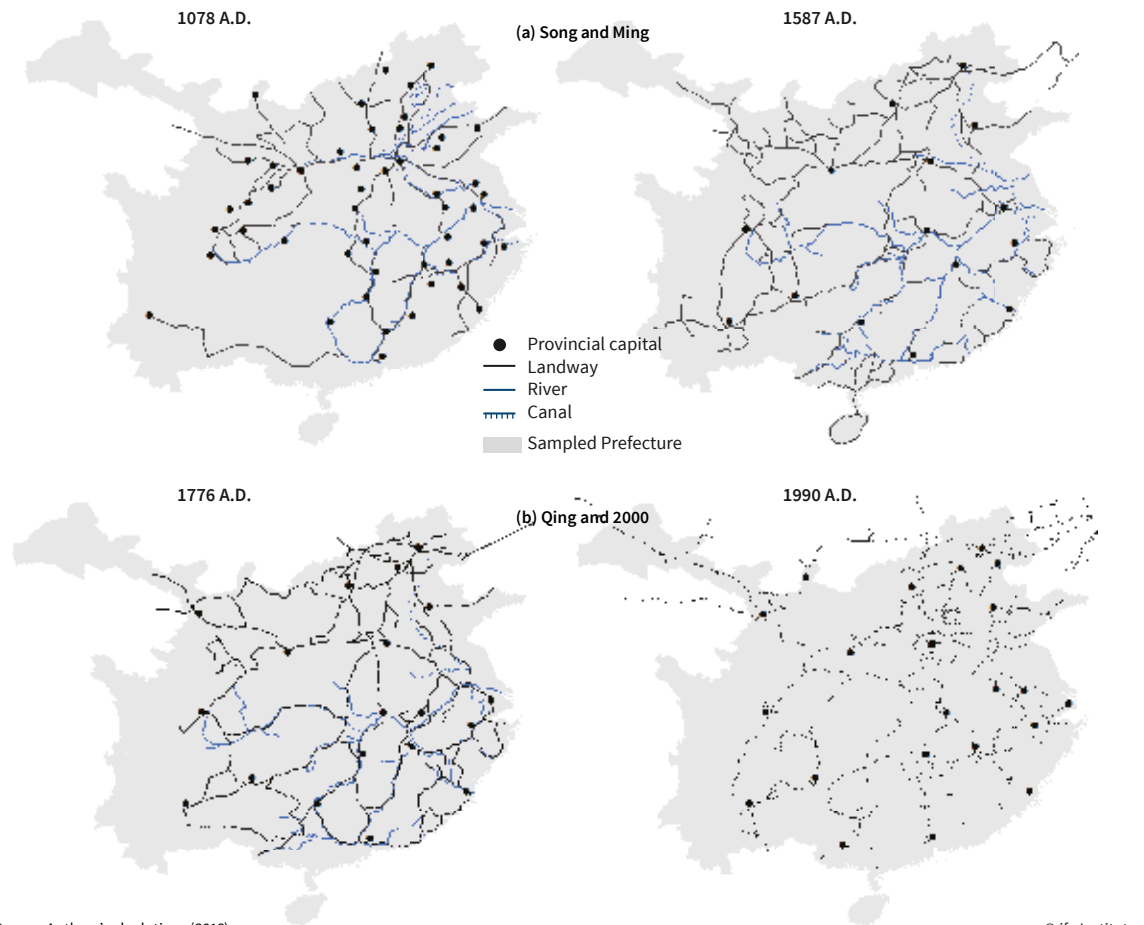
**CONCLUDING REMARKS**

A combination of an enduring state, a distinctive political hierarchy, and many changes in national and provincial capitals make China a particularly advantageous context for examining the link between politics and economic geography. Given that the first-tier cities in today’s China are typically provincial capitals, it is perhaps not an exaggeration to claim that political hierarchy shapes the country’s urban hierarchy.

The existing literature on path dependence has provided us with abundant examples, which show that

Figure 5

## Transportation Networks



history matters. Yet we also observe changes in economic activity in many contexts, not only in terms of regional development, but also in terms of industrial location within and across countries. By documenting when history matters little, this paper actually offers key insights into why history matters. History would matter more if a state lacked the incentives to relocate its capitals. If China, for instance, were so small and homogeneous that the choice of capitals mattered little, or if the state lacked the capacity to relocate economic activity even if it had the incentive to do so. We hope that such a perspective is useful in interpreting persistence and changes in different contexts.

## REFERENCES

- Bai, Y., and R. Jia (2018), "When History Matters Little: Political Hierarchy and Regional Development in China, AD1000–2000", Working Paper, Chinese University of Hong Kong and the University of California, San Diego.
- Bleakley, H., and J. Lin (2012), "Portage and Path Dependence," *Quarterly Journal of Economics* 127(2): 587–644.
- Davis, D., and D. Weinstein (2002), "Bones, Bombs, and Break Points: The Geography of Economic Activity," *American Economic Review* 92(5): 1269–1289.
- De Long, B., and A. Shleifer (1993), "Princes and Merchants: European City Growth before the Industrial Revolution," *Journal of Law and Economics* 36(2): 671–702.
- Nunn, N. (2009), "The Importance of History for Economic Development," *Annual Review of Economics* 1(1): 65–92.
- Rauch J. (1993), "Does History Matter Only When It Matters Little? The Case of City-Industry Location," *Quarterly Journal of Economics* 108(3): 843–867.