

Networks of Destruction:
Political Patronage and the Great Leap Famine of China

Abstract

We study the mortality cost of political patronage in the context of China's Great Leap Famine (GLF; 1958-1962). As a direct consequence of a series of radical and misguided policies implemented during a political and economic campaign initiated by China's top leader Mao, the GLF caused millions of deaths in rural China, with famine mortality varying substantially across provinces. We show that provincial party leaders who were socially connected to Mao 1) pursued Mao's policies with more zealotry, which led to significantly more famine deaths in their jurisdictions; 2) were more likely to get promoted right before the GLF; 3) had more interactions with Mao during the GLF. Our results point to political patronage as an important contributing factor of the Great Leap Famine.

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1. Introduction

In their quest to rapidly transform society and build socialism/communism, early leaders of socialist systems inflicted massive sufferings in rural areas, including six of the ten worst famines of the 20th century (Courtois et al 1999; Zycher, 2016).¹ Especially deadly amongst these was China's Great Leap Famine of 1958-62 under Mao, which claimed between 16.5 and 45 million casualties (Ashton et al. 1984, Coale 1981, Peng 1987, Dikotter 2010). Though there has been progress in documenting the causes and consequences of the Great Leap Famine, open questions and major puzzles still remain.

Most authors who have written on the Great Leap Famine blame Mao and his radical, misguided economic policies for causing it (Becker 1998; Dikötter 2010; Thaxton 2008; Yang 2012). At the same time, it has been noted that famine severity varied substantially across Chinese provinces. As depicted in Figure 1, some provinces, notably Anhui, Henan and Sichuan, suffered massive losses of life while Jiangxi, Liaoning and Shanxi remained relatively unscathed. This begs the question as to why various provinces fared so differently under the same political regime and the same national leadership. Much of the existing literature resorts to differences in economic endowments and failures in central planning to explain this pattern (Li and Yang 2005, Lin and Yang 2000, Meng et al. 2015). A few studies have noted differences in policy intensity across provinces (Chang and Wen 1997, Kung and Lin 2003, Yang 1996). Still, it is unclear why these policies were implemented with different intensity, and how such differences resulted in significant variations in the incidence of famine across the country.^{2 3}

In this study, we uncover a strong association between provincial party leaders' social connections with Mao and famine severity in their jurisdictions. In particular, we show that provincial party leaders

¹ As measured by excess mortality.

² A small number of earlier studies have paid some attention, albeit anecdotally, to the important role played by provincial leaders in the Great Leap Forward (Yang 1996; Teiwes and Sun 1999). Teiwes writes of the "remarkable, indeed astonishing, influence of provincial leaders" (Teiwes and Sun 1999: 195).

³ Kung and Chen (2011) hypothesize that provincial leaders who had reached the highest level of their career ladders faced weaker prospects for further promotion in the Communist Party hierarchy. They provide evidence that, compared to high-rank provincial leaders, middle-rank leaders were more radical in implementing the grain procurement policy during the GLF. However, using the same data source and method, Yang et al. (2014) found that their key measure of radicalism, the excess procurement ratio, is systematically higher when provincial leaders are coded as "middle-rank" and lower when coded as "high-rank". After correcting the data, Yang et al. (2014) find that Kung and Chen's (2011) main results cannot be replicated. See Yang et al. (2014) for more details.

who were socially connected to Mao, those we refer to as “connected”, implemented Mao’s (bad) policies with greater effort, which led to more famine deaths in their provinces. Additionally, the connected provincial party leaders were more likely to get promoted and had more frequent interactions (meetings, conversations, and correspondence) with Mao during the famine period. We argue that these results are consistent with a simple hypothesis based on political patronage. Namely, local officials who were socially connected to Mao were more likely to be in a patron-client relationship with him and therefore had a greater incentive to support policy choices favored by Mao so as to pay him back for political favors (promotion), even if those policies were misguided and were costly to the population in their jurisdictions.

Our focus on the role of political connections between Mao and local officials is motivated by a growing literature on political clientelism and patronage. The exercise of political patronage, which refers to a phenomenon of politicians offering material goods or public resources in exchange for support among subordinates, has been widely documented in both traditional and modern societies, and in both democratic regimes and non-democracies (Kopecký and Mair 2006, Stoke 2013). In many regimes, political leaders face challenges in obtaining accurate information about the relative distribution of power among the political elites as well as the loyalty of political allies and even subordinates (Svolik 2012). To cope with such information asymmetry and the anxiety and distrust it breeds, political leaders concerned with re-election or political survival resort to clientelistic networks to gain influence and consolidate power (Acemoglu and Robinson 2001, Bueno De Mesquita et al 2003). They build institutions such as parties and legislatures to channel and broaden their bases of support (Colonnelli et al., 2017; [Gandhi and Przeworski, 2007](#); [Gandhi, 2008](#)). They also turn to informal bonds and affinities, such as ethnicity, kinship ties and other social connections, so as to strengthen the sinews of their power (Alesina et al., 1999; Burgess et al., 2015; Cruz et al., 2017; Shih et al. 2012; Xu, 2018).

In theory, the impact of political patronage on organizational performance is ambiguous. On the one hand, patron-client networks can improve bureaucratic selection because the patron/principal may have better “soft” information concerning members of their network, and may thus be able to screen them on dimensions of talent that we cannot observe (Colonnelli et al., 2017). Political patronage can also improve bureaucratic efficiency if loyalty is able to alleviate agency problems within political hierarchies (Jiang 2017). On the other hand, political patronage may disincentivize subordinates within the network (Aghion and Tirole, 1997; Xu 2018). If there are tradeoffs between the loyalty and the competence of subordinates, patronage will also lower the quality of selected bureaucrats (Egorov and Sonin 2011).

Empirical research in this literature has been primarily focused on how political connections affect electoral outcomes and political promotion (Cruz et al., 2017; Jia et al. 2015; Shih et al. 2012). Despite the importance of political patronage, there is a relative dearth of evidence on its social and economic consequences. We contribute to a small set of recent studies that examine the costs of political patronage (Colonnelli et al. 2017, Xu 2018), and add to this work by studying the mortality cost of political patronage in the context of China’s Great Leap Famine.

To this end, we collected detailed biographical data for Mao and each provincial party leader who served during 1954-1964, and constructed predetermined proxies for social connections that are defined by shared birthplace, a teacher-student relationship, and common revolutionary experiences in earlier years. We also assembled a rich panel dataset from various sources to measure famine severity and the radicalism (effort) of provincial party leaders in implementing Mao’s policies. Our main identification strategy is a difference-in-differences model, where we compare the (mis)fortunes of provinces with connected party leaders with those with unconnected party leaders, during the Great Leap Famine period (GLF; 1958-1962) and in normal years.

Our results reveal that provinces with leaders connected to Mao had significantly higher mortality rates and smaller birth cohort sizes than those without. The magnitude of the effect is noteworthy: mortality rates in provinces governed by connected party leaders were about 6 *per thousand* higher than in provinces that were not. The effect is large, corresponding to 46% of the mean level of mortality during the sample period (13.04 *per thousand*). Meanwhile, birth cohort size in provinces with connected leaders was about 17% smaller, suggesting a lower fertility rate and higher infant mortality rates in these provinces. These results are robust across specifications and to the inclusion of a variety of different covariates.

The provincial-level analysis is complemented by a dataset constituted by pairs of contiguous counties on opposite sides of provincial borders. This estimation strategy takes advantage of policy discontinuities at provincial borders, and compares the birth cohort size of contiguous counties which are governed by provincial party leaders with and without connections, respectively. Since contiguous counties are similar in most respects, this exercise alleviates concerns one might have about the endogenous assignment of provincial party leaders; to wit, connected provincial leaders may have been assigned to provinces that were more “vulnerable” to negative shocks. Results from the contiguous-county specification are similar to the baseline results. We find that the birth cohort size of counties in provinces

governed by connected leaders was 11-23% smaller than in counties located in provinces where leaders were unconnected.

We then turn to the mechanisms through which connected leaders may have been induced to pursue policies that resulted in higher mortality rates and smaller birth cohort sizes. Using a variety of measures, we find that the GLF policies promulgated by Mao were implemented more intensely in provinces with leaders connected to him. Moreover, using data digitized from official records on Mao's daily activities, we show that Mao had more interactions with connected provincial party leaders during the GLF period. Our evidence runs contrary to hypotheses that attribute the Famine to information frictions within political hierarchies, or Mao's lack of information concerning the Famine. Rather, our empirical findings suggest that provincial party leaders who were members of Mao's clientelistic network were more responsive, or were under more pressure, to implement Mao's costly GLF policies. Most importantly, based on the same set of provincial party leaders who served at any time during our sample period of 1954-1964, we find that provincial party leaders who were socially connected to Mao were more likely to get promoted right before the beginning of the GLF. Compared to those who did not have social connections to the supreme leader, connected provincial leaders were 28-32% more likely to be promoted to a higher rank in the communist party.

Taken together, our results are highly consistent with the patron-client hypothesis and point to political patronage as an important contributing factor to China's Great Leap Famine. We provide evidence against alternative explanations, including negative selection of provincial party leaders (i.e. connected leaders are of lower ability) and ideological similarity (i.e. connected leaders are more similar in ideology to Mao).

This study is closely related to the literature on political clientelism and patronage. A large body of empirical studies in this literature have examined the impacts of patronage on electoral outcomes and political promotion (Cruz et al., 2017; Jia et al. 2015; Landry et al. 2017; Shih et al. 2012, Xu 2018), however, relatively little is known about the social and economic consequences of political patronage. In addition to promotion, Xu (2018) studies how patronage affects governors' tax performance in the historical context of British colonies. Colonnelli et al. (2017) show that patronage lowers the quality of selected public employees in Brazil. Our work complements these studies in economics and political science by examining the mortality cost of patronage due to the distorted incentives of local officials in implementing policies favored by the leader of a patronage network. In contrast to recent studies which

focus on the loss of bureaucratic efficiency stemming from patronage, our paper highlights an overlooked risk imposed on society by patronage: bad and costly policies favored by political leaders can be difficult to correct, and may be amplified by the practice of patronage; in extreme cases such as the GLF, this mechanism has led to tens of millions of deaths.

Our work also sheds important light on the nature and dynamics of China's political economy during the Mao era. A tendency in recent research on China's political economy is to assume that local officials are largely homogeneous and that they compete for promotions through some sort of political tournament mechanism, most often based on economic performance (Li and Zhou 2005; Kung and Chen 2011). Our study begins by recognizing the heterogeneity of provincial leaders and finds that an understanding of their differential political network ties is essential to an understanding of both private goods distribution (such as political promotion) and economic/social outcomes in non-democracies.

Lastly, this study contributes to the literature on China's Great Leap Famine. As noted earlier, prior studies in this literature primarily focus on the role of radical policies in causing the Famine (Chang and Wen 1997, Li and Yang 2005, Lin 1990, Kung and Lin 2003, Yang 1996). Our research complements these studies by providing a new explanation that could largely account for regional variations in policy intensity and famine mortality. In support of our central argument, we constructed an original dataset from various sources, including the digitized official records of Mao's daily activities. As far as we know, this is the first time these data have been used for empirical analysis.

The remainder of the paper proceeds as follows. Section 2 describes the historical setting within which the GLF occurred. Section 3 describes data and details the construction of primary measures used in our analysis. Section 4 discusses the results and the interpretations. Section 5 provides evidence against alternative explanations. Section 6 concludes.

Figure 1 about here.

2. Historical context

In this section, we provide a brief discussion about the historical background of China's Great Leap Famine, highlighting the crucial political changes right before and during the GLF, as well as the variety of radical policies implemented during that period.

A. Mao's Leadership of the CCP and Ambitious Development Goals

When the Chinese Communist Party (CCP) defeated the Nationalist Party in the second Chinese Civil War and took control of mainland of China in 1949, Mao was the supreme leader and was in firm control both of the CCP and of the military. Mao's ascent to power began during the first Chinese Civil War (1927-1937), especially during the Long March (1934-1935), where he successfully led the Red Army of the Communist Party, allowing it to evade the pursuit of the Nationalist Party army and to retreat to the west and north of China. Mao's leadership during the retreat gained him the support of party members. After Mao became Chairman of the new Central Military Commission in 1937, he devoted enormous efforts to solidifying his position in the Party and the military, partly through making key appointments and partly by browbeating or purging potential rivals (Pantsov and Levine 2013; MacFarquhar and Schoenhals 2009). A well-known episode is the Yan'an Rectification Movement (1941-44), which was the CCP's first mass ideological campaign to purge the Party of undesirable elements and remold it, especially the elite, in support of Mao. During this movement, Mao subjected most members of the Politburo, especially CCP leaders who had preceded him, to rounds of self-criticism and struggle sessions for their errors of leadership and other sins. Many other senior leaders also went through severe questioning and struggle sessions for their mistakes during the war.⁴ By the time the Rectification Movement was brought to a conclusion during the seventh plenum of the Sixth Central Committee (1944-45), Mao was in firm control of the Party and of the military (Kampen 2000). The Seventh Party Congress quickly followed and Mao was now able to pack the 7th Central Committee (CC) with his supporters and followers.

Following the CCP's takeover of national power in 1949, Mao's prestige rose still further, as did his political preeminence. In 1956, the CCP convened its Eighth National Congress. 66 percent of the 97 full members in the Eighth CC were either full or alternate members of the Seventh CC. Nonetheless, Yang et al. (2014) note that fresh faces accounted for 34% of the full CC members and 96% of the alternate members in the Eighth CC. Altogether 103 previous non-members became new CC full and alternate members in 1956, and another 25 joined in 1958.

While Mao was the predominant leader in the 1950s, he had also delegated many responsibilities for economic governance to others, as China emulated the USSR in building a centrally-planned economy,

⁴ For example, Ke Qingshi and Tao Zhu. However, Mao rescued some individuals from the intense interrogations after he was satisfied with their confessions. Both Ke and Tao became diehard followers of Mao after he rescued them.

only to be frustrated by the increasingly technical complexity of this new system. Hailing from rural Hunan, he had a special interest in and was consistently in favor of faster socialist transformation in the countryside. He put enormous political pressure on other central and provincial leaders, and repeatedly criticized them for having resisted efforts to speed up investments and economic growth as “rash advance” in 1956-1957. In order to dramatically speed up industrial development and rural transformation by mass mobilization, Mao launched the so-call “Great Leap Forward” campaign in 1958. Following the USSR’s announcement that it would seek to catch up with the United States, Mao announced in 1958 that China would catch up with Great Britain, especially in steel output, in 15 years, a goal that would soon be upped again and again and expanded to include the United States. Amid a strained relationship with Khrushchev, who had just denounced Stalin (and his forced-draft collectivization), Mao wanted China to achieve a Great Leap Forward through mass mobilization. Success with the Great Leap Forward would enable Mao to chart a Chinese path to development that departed from the Soviet model of development (Xie 1996: 72) and gain greater clout within the socialist camp (Shen Zhihua 2013a).

Figure 2 about here.

B. The Great Leap Forward

Mandated collectivization: When the Chinese Communist Party took over, China was a poor agrarian economy with over 80% of the population living on small plots of farmland in rural areas. Mao believed that organizing agricultural production into larger units would help to unleash the potential of the vast countryside, which would then serve as a reservoir of labor and resources for making the leap. He urged rural China to promote collectivization, which he believed would boost grain output, which could then be extracted to fund industrialization.⁵ In response to Mao’s call for transformation, the organizational form that emerged in 1958 was the People’s Commune. Private property rights to land and assets were abolished. Markets for private transactions were banned. Farmers were forced to work in production teams which consisted of 20-30 households (Lin, 1990). The People’s Commune moniker received Mao’s blessing in August 1958. Amid the euphoric echo chamber of the Great Leap Forward, it spread quickly. By the end

⁵ Grain was to be procured from rural households to feed urban workers and to be exported in exchange for industrial equipment.

of October 1958, more than 99 percent of all households in rural China had been corralled into 26,500 communes, averaging 4,756 households each (Yang 1996: 36).

Under the collectivized agricultural system, because it was extremely difficult and costly to monitor labor effort of each team member, the distribution of output among farmers within a production team was tied up to their work hours rather than marginal labor input. In hindsight, it is hardly surprising that the forced collectivization, as had occurred in the Soviet Union in the early 1930s, undermined labor incentives and, together with government control over grain distribution, led to reduced grain output (Lin 1990; Meng et al. 2015). As depicted in Figure 2, when agricultural collectivization was completed in 1958, total factor productivity (TFP) in agriculture experienced a sharp decline. The agricultural productivity remained low in the next two decades, until the government started to decollectivize its agriculture in 1978.⁶

Labor diversion: Along with the rise of people's communes, there was a massive diversion of the labor force from agriculture to industry. The agricultural labor force was reduced by 38 million between 1957 and 1958. In 1958, 16.4 million peasants, about twice the size of the industrial labor force in 1957, were relocated to cities for industrial and construction projects. The diverted laborers were also likely to be prime age males who were more productive than those who remained in the countryside (Li and Yang 2005). In the winter of 1957-1958, the government also mobilized over 100 million peasants to undertake large irrigation and land reclamation projects and to produce steel in their backyards (Li and Yang 2005).⁷ As a result, national iron and steel output more than tripled between 1957 and 1960 and then collapsed to its pre-GLF level in 1962. As a result of the decline in both productivity and labor input, total grain output declined by 15% in 1959 and by another 16% during 1960-1961 (Figure 3). To make things even worse, peasants being diverted to highly calorie-intensive activities also raised demand for food.

Output inflation and grain procurement: Despite the sharp declines in grain output, the government imposed an excessive grain procurement burden on peasants. Grain was procured to feed urban workers and to be exported in exchange for industrial equipment and technology. The situation was made worse as local officials threw all caution to the wind and competed to exaggerate their output projections to

⁶ Known as the Household Responsibility System (HRS) reform.

⁷ The "backyard iron furnaces" were built with mud and brick, burned wood and coal as fuel and used scrub metal as raw materials (Li and Yang 2005).

please Mao, which in turn prompted upper levels of government to procure more grain and for China to boost grain exports. The procurement ratio increased by around 10% in 1958 and by another 40% in 1959. The procurement ratio started to decline in 1960 and did not return to its pre-GLF level until 1962.

Communal dining halls: During the GLF, communal dining (mess) halls were widely introduced and peasants were actively discouraged from eating at home (by taking their woks away for smelting in the “backyard iron furnaces”). Once farmers were forced to participate in the communal dining system, grain was no longer distributed to individual households for private consumption. Instead, it was retained and prepared by communal kitchens and provided to participants free of charge. The initial aim of communal dining was to free women from household chores so that they could participate in agricultural production. However, the tragedy of the commons led to over-consumption of grain and a great deal of food wastage, which significantly exacerbated food shortages.

C. The Great Leap Famine and Confrontation during Lushan Conference

As a direct consequence of the Great Leap Forward policies, the famine started to strike some provinces as early as 1958, including Gansu, Sichuan, and Yunan. The national mortality rate increased from 10.8 to 12 per thousand during 1957-1958 and further rose to 14.6 in 1959.

It is widely believed that the worst excesses of the GLF could have been mitigated had the adjustment policies that Mao personally introduced prior to the Lushan Conference of summer 1959 actually been implemented. Between November 1958 and July 1959, Mao himself recognized the excesses of the Great Leap Forward and became aware of starvation and famine in some areas. Though Mao still believed in the GLF, he made efforts to reduce the unrealistic steel production targets, scale back capital investment, and stabilize the people’s communes, including a reduction in communal dining (Xie 1996, 35). By June 1959, Mao appears to have felt that, after eight months of correcting “leftism”, the problems with the GLF had largely been dealt with.

In the event, the Lushan Conference of 1959 turned out to be a debacle of biblical proportions.⁸ Mao took a letter from Defense Minister Marshall Peng Dehuai as a challenge to his authority. After Mao launched a fierce attack on Peng Dehuai and Peng’s sympathizers as “right opportunists”, the rest of the

⁸ The Lushan Conference was actual a series of conferences held in July-August 1959 on Mt. Lushan in Jiangxi Province: an expanded Politburo meeting and the Eighth Plenary Meeting of the Eighth CCP Central Committee.

CCP leadership quickly fell into line behind him (Li Rui 1999). As a result, the problems associated with the Great Leap Forward were brushed aside. Instead, Mao and the entire country resuscitated the GLF with a vengeance. As far as rural China was concerned, communal dining halls were again vigorously promoted while labor was diverted to steel making and water works; grain procurement was stepped up even while output suffered; exports of grain also continued (Yang 1996, Yang Jisheng 2012). This helped to produce the most devastating famine in human history.

Figure 3 about here.

The mortality rate peaked in 1960, the year following the Lushan Conference (Figure 3). In addition, mortality rates were highest for the elderly and young children (Ashton et al. 1984). According to (adjusted) official population statistics released after the Mao era, the Chinese population suffered a net decline of 10 million people in 1960, with the worst months being the spring of 1960.

Although the Chinese government began to systematically respond to the famine in the summer of 1960, including providing relief to the most affected regions, reducing grain procurement, and eliminating the communal kitchens, provinces varied substantially in their efforts and attitudes (Yang 2012). To hide the famine in their jurisdictions, some local governments went so far as to prevent starving peasants from migrating. Sichuan, the most affected province, continued to export large amount of grain to the municipalities of Beijing, Tianjin, and Shanghai. In a state conference held in early 1962, Mao officially acknowledged his mistakes and the failure of Great Leap Forward. It was not until then that the famine ended in most provinces and the national mortality rate returned to its pre-GLF level.

3. Data and Measurement

Our main hypothesis is that provincial party leaders who were politically connected to Mao were more likely to be in a patron-client relationship with him; they would therefore have had stronger incentives to implement Mao's radical GLF policies, leading to more severe famine conditions in the jurisdictions under their control, especially after the Lushan conference. To test this hypothesis, we combine data from various sources. Before turning to our empirical results, we therefore first spell out how we construct empirical measures of political ties to Mao, famine and GLF policy intensity, as well the promotion of provincial leaders and their interactions with Mao.

Political Ties to Mao

Identifying political network ties is challenging because many such relationships are hidden or unknown to the public. Thus, one cannot simply sum up well-known and officially documented ties involving friendship, as doing so can lead to severe biases. The literature has relied on three dimensions of personal ties, which are often employed in the cultivation of patron-client relations, to proxy for network ties. These are (i) shared geographical origins, (ii) common schooling, and (iii) shared work experiences (Jia et al. 2015, Landry et al. 2013, Shih et al. 2012, Xu 2018). While none of these links necessarily leads to strong network ties, their existence, taken jointly, provides the basis for repeated interactions that might facilitate the development of strong ties (Granovetter 1973).

In what follows, we follow the existing literature and measure the pre-existing relationship between Mao and provincial party leaders through a shared home province, a teacher-student relationship, and shared revolutionary experiences. To do so, we digitize data from official biographies and construct an individual-level dataset of provincial party leaders. The data are drawn from four sources: (i) *Materials on the Organizational History of China's Central Communist Party*, (ii) *A Compendium of Central Committee Members of Various Plenums 1921-2003*, (iii) *Biographies of People in the First Red Front Army (Zhongguo Gongnong Hongjun Diyi Fangmianjun Renwuzhi)*, and (iv) various local chronicles and government websites. We rely on the *Materials* to match provincial party leaders to specific provinces at any given point in time. The *Compendium* and *Biographies* provide detailed biographical information for all individuals who have ever been a member of the Chinese Communist Party Central Committee or a military officer in the First Red Front Army (the *Hongyifangmian* Army, a major communist army force that was founded and led by Mao in earlier years). For provincial party leaders who were not Central Committee members or military officers in the First Army, we derive the same information from government websites and local chronicles.

We measure the social ties of provincial party leaders to Mao by constructing a dichotomous variable indicating whether a provincial leader was born in the same province as Mao (Hunan), attended two military institutes that Mao had led and taught at in earlier years,⁹ or worked under Mao as a military

⁹ Namely, the 6th Peasant Movement Institute (*Guangzhou Nongmin Yundong Jiangxisuo*) in 1926 and the Anti-Japanese Military University (*Kangri Junzheng Daxue*) in 1937, both of which have produced many famous military officers for the Communist Party.

officer during the revolutionary period in the First Red Front Army. --- 这个部分确实不太让人满意--- 为什么是这几个指标？ 而不是其他—还有其他吗？ 工作关系， 老乡比较好说， 但毛教课的讲习所为什么可以？

The biographies also allow us to measure other characteristics of provincial leaders, including age, education, years of tenure in the party, Long March experience, career advancement, and whether the leader was a native of the province he governed. In [Appendix Table 1](#), we provide the full list of connected provincial party leaders and the details of their connections to Mao. Our results are robust to changing the coding of the “connected to Mao” variable. In later analyses, we exclude the teacher-student relationship criterion and recode the connection variable so that it is only based on whether the provincial party leader hailed from Hunan or had revolutionary experience in common with Mao: our main results are qualitatively unaffected.

Famine severity and GLF policy intensity

We first adopt mortality rates at the provincial level as our measure of famine severity (Yang 1996, Lin and Yang 2000, Kung and Lin 2003, Meng, Qian, and Yared 2015). In the contiguous county-pair level analysis where data on mortality are not available, we use the China Population Census of 1990 to construct birth cohort size for each county and year to measure famine severity. The rationale behind using birth cohort size of survivors to measure famine severity is that counties which experienced more severe famine conditions also experienced a higher level of infant mortality and lower fertility, both of which lead to smaller cohort size (Meng et al. 2015). Another advantage is that a measure constructed from population census data is less likely to suffer from misreporting (Miller and Urdinola 2010). Because of China’s rigid household registration system, people were forbidden to move across county borders between when the famine occurred and when survivor cohort sizes are measured in our data (Meng et al. 2015, West and Zhao 2000). This contributes to making birth cohort size a valid proxy for famine severity.

To provide evidence concerning the intermediate pathways leading from provincial party leaders’ connections to Mao to famine severity, we construct measures of the intensity of various radical policies and programs implemented during the GLF. As detailed above, the famine occurred largely due to four policies and programs favored by Mao: (i) agricultural collectivization that substantially reduced work incentives among farmers, (ii) the massive diversion of labor from the rural sector for industrialization purposed, (iii) over-procurement of grain from rural households to feed urban workers and for exports,

and (iv) forced participation in a communal dining system that substantially decreased consumption efficiency.

Both agricultural collectivization and labor diversion for industrialization contributed to a substantial decline in grain output. Since detailed data on the degree of collectivization and on labor diversion are not available, we use the (negative) growth rate of grain output as a proxy. We complement this proxy with steel output (Li and Yang 2005), since “catching up with Great Britain in steel output” was the explicit goal announced by Mao and resources were diverted from rural areas mainly for that purpose. The “net procurement ratio” is the ratio of the net amount of grain procured from rural households to total grain output (Kung and Chen 2011). The communal kitchen variable is measured by the proportion of people who were forced to participate in the communal dining system (Yang 1996).

Data on mortality are drawn from *A Compilation of Historical Statistical Data of Provinces, Autonomous Regions, and Municipalities, 1949-1989* (*Quanguo Gesheng Zizhiqu Zhixiashi Lishi Tongji Ziliao Huibian, 1949-1989*), compiled by the State Statistical Bureau in 1990 (See Lin and Yang 2000). Data on grain output, procurement and agricultural resale are obtained from *Economic Data of Agriculture, 1949-1983* (*Nongye Jingji Ziliao, 1949-1983*), compiled by the Planning Office of the Ministry of Agriculture, Livestock, and Fisheries in 1983 (see Lin and Yang, 2000; Kung and Chen 2011). Data on the participation rate in communal dining halls are drawn from Yang (1996) and are only available for 1959. Finally, the main source for data on other provincial characteristics, including steel output and rural and urban populations, are drawn from *Comprehensive Statistical Data and Materials on 50 Years of New China, 1949-1998* (*Xinzhongguo Wushinian Tongji Ziliao Huibian*), compiled by the State Statistical Bureau in 1999 (See Meng et al. 2015). During the GLF, provinces also tried to please Mao by exaggerating their grain output. We draw upon data from Fan et al. (2016) to measure the extent to which provinces over-reported their actual grain output.

Promotion and interactions with Mao

To provide evidence in support of patronage as the leading explanation behind our empirical results, we examine how provincial party leaders’ connection to Mao affected the pattern of promotions. We measure promotion by membership in the Central Committee. Within the CCP, the Central Committee, elected (or rubber-stamped) by the National Party Congress, is theoretically the highest organ of power and membership is highly coveted. Membership in the Central Committee is generally associated with higher political status and rank, more decision-making power, and a chance to enter into the top leadership.

In the present study, we focus on promotion patterns in the 8th central committee because, as noted earlier, the size of the Central Committee was expanded substantially at the Eighth Party Congress. This was the first national Party Congress following the CCP takeover of national power and the expansion of the Central Committee allowed Mao to reward military and political leaders after many years of war-making. To the victors go the spoils.

We classify promotions to the Central Committee during the Eighth Party Congress into two categories: "normal" and "special" promotions. Normal promotions are those that involve moving up one rung in the hierarchy, i.e. from non-member to alternate member, or from alternate member to full member. Special promotions correspond to those officials who were catapulted from outside the Central Committee (non-member) to full membership of the CC during the Eighth National Party Congress. A provincial leader is either specially, normally, or not promoted during the Eighth National Party Congress between 1956 and 1958. An important feature of these promotions is that they corresponded to promotions in terms of political rank, rather than solely administrative levels or positions. Almost all of the provincial leaders we study ended up governing the same province before and after their promotion.

To provide additional evidence on our interpretation of the data, we digitized data on Mao's direct interactions (conferences, conversations, public visits, correspondence) with each provincial party leader in the 1950s and 1960s, based on official records of Mao's daily activities kept by his personal secretaries (*Maozedong Nianpu*). These records provide rich information about whom Mao communicated with, when and where they communicated, and the form taken by the communication. We classify interactions between provincial party leaders and Mao into five types: 1) attending regular Supreme State Conference and Central Committee conferences held by Mao; 2) accompanying Mao on domestic and foreign visits and at recreational events (dinners, films, etc.); 3) attending *ad hoc* conferences called by Mao (zhaoji); 4) having private conversations with Mao; 5) contacting Mao via mail or receiving Mao's reply to and comments on their reports. We tally the type, frequency, and total number of interactions with Mao by provincial party leader and year.

Our sample period is 1954-1964, covering the entire GLF period (1958-1962), as well as four years before and two years after. We choose 1954 as the starting year because it is the first year for which complete data on provincial statistics are available and provincial boundaries issues are settled. We end the series in 1964 because the Chinese economy had by then stabilized, as well as to avoid conflating our results with the effects of the Cultural Revolution, another political campaign initiated by Mao in 1966

that caused millions of deaths. Our results, however, are not sensitive to different sample cutoffs. The descriptive statistics for variables used in the analysis are reported in [Table 1](#).

Table 1 about here.

4. Results

We first focus our empirical analysis on provincial variations in famine severity, as measured by mortality rates and birth cohort size as our dependent variables. Our main explanatory variable is an indicator for pre-determined social ties of a provincial party leader to Mao, defined as sharing common birthplace, shared revolutionary experience, and a teacher-student relationship, as described above. To explore the pathways through which provincial party leaders' social ties to Mao affected famine severity, we use data on the implementation of GLF policies as intermediate outcomes. We complement the analysis at the provincial level with analyses of data from contiguous county-pairs that straddle provincial borders, with birth cohort size as the measure of famine severity. In order to provide support for our interpretation, we then examine the impact of connections to Mao on the promotion patterns of provincial leaders as well as the frequency of their interactions with Mao.

Connections to Mao and Famine Severity – Province-level Analysis

Our first goal is to estimate the reduced form effects of a provincial party leader's connection to Mao on famine severity (mortality rate) in their jurisdictions. We begin with data at the provincial level to compare provinces governed by connected leaders to those that were not, during the *GLF* and during "normal" years. For province p and year t , we estimate the following specification:

$$Severity_{pt} = \beta_0 * Connection_{pt} + \beta_1 * Connection_{pt} * GLF_t + \gamma * X_{pt} + \mu_p + \lambda_t + \varepsilon_{pt} \quad (1)$$

where $Severity_{pt}$ is the mortality rate in province p and year t and $Connection_{pt}$ is an indicator that equals 1 if province p is governed by a connected party leader in year t . GLF_t is an indicator for years between 1958 and 1962 and X_{pt} is a set of time-varying covariates at the province level. We introduce province fixed effects μ_p to absorb time-invariant unobserved province-specific heterogeneity that may be correlated with the explanatory variables, and year fixed effects λ_t to absorb time-varying determinants of the mortality rate common to all provinces. Parameters β_0 and $(\beta_0 + \beta_1)$ identify the effects of being

connected to Mao on mortality rates in normal years and during the *GLF*, respectively. The key parameter of interest β_1 quantifies the difference between them.

One threat to our identification strategy is that connected provincial party leaders may have been more likely to be appointed to provinces with certain characteristics. If those characteristics affected mortality rates differently in *GLF* and non-*GLF* years, estimates of the key parameters will be biased. To alleviate this concern, we have taken two measures. First, in all of the specifications, we allow for the impact of covariates to vary during the *GLF*. Second, we test for the presence of endogenous assignment by regressing the connection variable on a wide range of provincial characteristics in the base year (1954). We find no evidence that the appointment of connected party leaders was correlated with economic, social, or political conditions of the provinces, either in *GLF* or in non-*GLF* years ([Appendix Table 2](#)).

[Table 2](#) presents our estimates of equation 1 with mortality rates as the dependent variable. All specifications, unless stated otherwise, are estimated for 25 provinces (provincial-ranked units) over 1954-1964.¹⁰ Tibet is not included due to missing data. Beijing, Tianjin and Shanghai are excluded because of their status as centrally administered municipalities.

Column (1) presents the results including only year fixed effects, provincial leaders' length of tenure in the party (to control for seniority), and a dummy indicating whether or not he was a native of the province to account for hometown favoritism (Hodler and Raschky 2014, Persson and Zhuravskaya 2016). Column (2) adds province fixed effects to control for all time-invariant unobservables at the province level. Column (3) further includes key economic covariates as suggested by prior studies: grain output per capita in the previous year (Lin and Yang 2000, Meng et al. 2015) and proportion of the population that is rural (Lin and Yang 2000). In the last column, we also control for provincial leaders' political rank in the Central Committee to account for the potentially different incentives for promotion among provincial leaders (Kung and Chen 2011).

The results reported in [Table 2](#) reveal a uniformly strong relationship between a provincial Party leader being connected to Mao and provincial mortality rates during the Great Leap Famine. The mortality rates in provinces governed by connected Party leaders were about 6 per thousand higher than in provinces that were not. Given that the average provincial mortality rate during the famine years (1958-1962) was

¹⁰ Our results are robust to extending the analysis to 1966.

14.98 per thousand, the magnitude of the effect is striking, and corresponds to a 40% differential. The results presented in Table 1 also show that being connected to Mao only affects mortality significantly during the GLF, while the point estimates for non-GLF years are generally small in magnitude and statistically indistinguishable from zero. Moreover, the key estimates are close in magnitude and robust to the inclusion of different sets of covariates, suggesting that omitted variable bias is unlikely to be a major concern.

Table 2 about here.

To ascertain the robustness of these findings, Table 3 reports results in which the log of birth cohort size is used as an alternative measure of famine severity. Results reported in Table 3 are consistent with those of Table 2. After controlling for provincial fixed effects (columns 2-4), our specifications indicate a strong negative impact of a provincial leader's connection to Mao on the provincial birth cohort size. Point estimates suggest that birth cohort size in provinces governed by leaders connected to Mao was roughly 17 to 19 percent smaller than in provinces that were not. Our results clearly show that the impact of being connected to Mao is statistically significant only during the GLF and is indistinguishable from zero for non-GLF years.

The results are also robust to using the log (as opposed to the level) of mortality rates as the dependent variable, to recoding the connection to Mao variable so that the school ties criterion is excluded, and to extending the sample period to 1966. In the interest of brevity, these additional results are relegated to Appendix Tables 3 through 5, respectively.

Table 3 about here.

Connections to Mao and Famine Severity – Contiguous County-Pair Analysis

In Appendix Table 2, we show that the assignment of connected provincial leaders is orthogonal to a large set of provincial characteristics, in both *GLF* and *non-GLF* years, although we cannot completely rule out the possibility that the assignment of connected provincial party leaders is endogenous to unobserved time-varying determinants of provincial mortality rates. For example, if somehow the connected party leaders were assigned to provinces which were more vulnerable to negative productivity shocks, their provinces could also experience higher mortality rates in the *GLF* years than the others, irrespective of any “connected to Mao” effect. To alleviate this concern, we follow Dube et al. (2010) and

estimate a specification using all contiguous county-pairs that are located on opposite sides of a provincial border in China.

This county-pairs identification strategy exploits variations between contiguous counties straddling a common provincial boundary. Contiguous counties within a pair tend to be similar in terms of geography, culture, and economic conditions, but were under different provincial party leaders and would therefore have been subjected to different intensities of GLF policies. By allowing us to better control for regional heterogeneity, the county-pairs comparison can thus alleviate our earlier worries concerning the selection of provincial leaders based on unobserved characteristics. Our preferred estimation strategy is the following:

$$Severity_{cpt} = \beta_0 * Connection_{ct} + \beta_1 * Connection_{ct} * GLF_t + \gamma X + \mu_c + \lambda_{pt} + \varepsilon_{cpt} \quad (2)$$

where $Severity_{cpt}$ is the measure of famine severity in county c , pair p and in year t . A given county c may appear in several pairs p that it belongs to. Since reliable mortality data are not available at the county level, we measure famine severity by birth cohort size: the dependent variable is the log number of survivors in 1990 who were born in county c in year t . With the inclusion of county fixed effects μ_c and pair-year effects λ_{pt} , identification comes exclusively from variation over time within contiguous county-pairs. In all specifications, we control for provincial leader characteristics, including years of tenure in the party and whether he was a native of the province he governed. Standard errors are clustered at the province and border segment level (Dube et al. 2010). For comparison purposes, we also estimate a naive specification that accounts only for county and year fixed effects, using all Chinese counties.¹¹ Both the traditional specification estimates and the border county estimates are reported in [Table 4](#).

The naive specification, estimated over all Chinese counties (column 1), indicates that counties in provinces ruled by connected provincial party leaders had birth cohort sizes that were 21 percent smaller than in counties that were not. Point estimates from the border county specification, which includes county, year, and county-pair fixed effects (column 3) are very similar, with mean birth cohort sizes being 21.5 percent smaller in counties located in a province ruled by a connected provincial leader than in the *contiguous* counties that were not. A more conservative specification (column 5), which allows for year

¹¹ Appendix Figures 1a and 1b depict the all-counties sample and border-counties sample, respectively.

fixed effects to vary by contiguous county pairs, produces a smaller coefficient. However, the 10.6% differential is still remarkably large and is statistically significant at the 1% level.

Because most famine fatalities were in rural areas, we also estimate analogs to equation 1, 3, and 5 using the *rural* birth cohort size as the dependent variable and present corresponding results in columns 2, 4, and 6, respectively. The results are consistent with those in columns 1, 3, and 5 with the point estimates being even slightly larger. Taken together, these results provide strong statistical evidence on the significant impact of provincial party leaders in causing the Great Leap Famine, which earlier studies have examined more anecdotally (Yang 1996; Yang 2012).

Table 4 about here.

Connections to Mao and Radicalism in the Great Leap Forward

In this section, we provide evidence on *how* connected provincial leaders caused more severe famine in their jurisdictions. In particular, we test whether provincial party leaders who were connected to Mao pursued Mao's policies more radically.

While the radicalism associated with the Great Leap Forward manifested itself in a multitude of ways, the zealous pursuit of steel and grain output is what first springs to mind. Mao's fixation with increasing steel and grain output was well known, and appears in numerous remarks he made during these tumultuous years. At the very beginning of the Great Leap Forward, Mao officially announced that the aim of the campaign was to catch up with the Great Britain in terms of steel output. As mentioned earlier, a series of radical policies were proposed by Mao to achieve that goal. These included the massive diversion of labor from the rural sector towards industrialization (steel production), agricultural collectivization that was believed to be able to boost productivity but turned out to substantially reduce work incentives among farmers, over-procurement of grain from rural households to feed urban workers and for exports, and forced participation in a communal dining system that caused vast food wastage. Another facet of the Great Leap Forward tragedy in rural China was the competitive and wild over-reporting or exaggeration of grain and other outputs by local officials. Such information distortions cascaded up the political hierarchy and contributed to the massive increases in government procurement, thus leaving behind less grain for the peasants' own consumption. Thanks to the increased procurement,

China continued to export significant amounts of grain in 1960 even though the country suffered a net population loss of more than 10 million people that year.

Given that direct measures of labor diversion are not available, and that most labor and other resources were diverted to support steel production, we use steel output as a synthetic measure of resource diversion. We also include the growth rate of actual grain output over the previous year to proxy for the degree of agricultural collectivization, as the decline in grain output was largely due to reduced work incentives in the collective farming system (Lin 1990). Over-procurement is measured by the ratio of net procurement from rural households to total grain output. Communal dining is measured by the share of population who were forced to participate in the communal kitchen system. Finally, we measure the over-reporting of grain by the percentage difference or “exaggeration rate” between the real output (as officially reassessed by the statistical bureau) and the inflated output. Regrettably, the grain output exaggeration rate is only available for 1958.

Table 5 reports results where log steel output, the growth rate of grain output, the net procurement ratio, the communal dining participation rate (1959), and the grain output over-reporting rate (1958), are the dependent variables in columns 1 to 5, respectively. From Column 1, we see that the key parameter, the coefficient associated with the interaction between the connected to Mao dummy and the GLF year dummy, is statistically significant and positive, indicating that provinces with party leaders connected to Mao produced more steel during the GLF years. These provinces, as shown in Column 2, also suffered larger falls in actual grain output. Since policies related to agricultural collectivization had been promoted as early as 1956, the growth rate of grain output in provinces with connected provincial leaders is 3.5 percentage points lower even in non-GLF years but this effect is marginally significant at conventional levels of confidence. During the GLF years, the differential reaches 6 percentage points and is statistically significant at the 1% level. Despite their larger decline in grain output, provinces with connected party leaders do not appear to have lowered their net procurement ratio (column 3). Columns 4 and 5 show that leaders connected to Mao induced a larger share of their populations to eat in communal dining facilities in 1959 and also exaggerated their grain output figures more in 1958. All these findings are consistent with our focus on the centrality of Mao’s networks for understanding the political dynamics of the Great Leap Forward and the Great Leap Famine.

Table 5 about here.

Provincial Leaders Connected to Mao Were More Likely to Get Promoted

As noted earlier, Mao had already gained political dominance within the CCP by the time of the 7th National Party Congress (1945). The Seventh Central Committee had 44 members and 33 alternate members. When the Chinese leadership convened the Eighth National Party Congress more than a decade later, in 1956, the CCP under Mao's leadership had unseated the Nationalist government on the Chinese Mainland by winning the Chinese Civil War and had governed the world's most populous country for several years. Given our knowledge of dictatorial leaders and their use of people and organizations, it is likely that the promotions awarded by Mao would not have been based purely on an evaluation of performance.¹² In line with our political patronage hypothesis, we hypothesize that provincial leaders with ties to Mao were more likely to be promoted. This constitutes the *pendant* within the patron-client relationship to the connected leaders in question pursuing more radical policies that was documented earlier.

Table 6 presents the results from an ordered probit model with promotion as the dependent variable, based on a sample of 48 provincial party leaders who served during our sample period of 1954-1964. Promotion takes on the value of 0 if the leader was not promoted; 1 if he was afforded a "normal" promotion, moving one rung up the hierarchy; and 2 if the promotion was "special", meaning that he moved up two rungs in the hierarchy.¹³ Whether or not we include covariates, the coefficient associated with a provincial leader being connected to Mao is always positive and statistically significant at the 1% level of confidence (columns 1, 5 and 6), providing compelling evidence of the advantages enjoyed by members of Mao's patronage network. The estimated marginal effects indicate that being connected to Mao was associated with a 28 to 32% (depending on which covariates are included) increase in the probability of getting a special promotion and a 29 to 34% decrease in the probability of career stagnation. Columns 2 to 4 include each of the three distinct political tie variables and show that all these measures are strong predictors of promotion, further bolstering confidence in our results.

Table 6 about here.

¹² Moreover, performance on battlefields is partly a function of top leadership choices—assignment of commanders to different battles and the allocation of resources.

¹³ **Appendix Table 6** provides the full list of provincial party leaders who were either specially or normally promoted before the Great Leap Famine.

Connected Provincial Leaders Interacted with Mao More Frequently during the GLF Years

The existence of ties based on geographic origin, a student-teacher relationship, or shared revolutionary experiences did not, of course, guarantee good relations with Mao. For our hypothesis to have explanatory power, it only needs to be true that those with such connections enjoyed *relatively* better relations with Mao. In this subsection, we demonstrate that our measure of Mao’s ties with provincial leaders is not an abstraction, but is associated with more frequent interactions between Mao and the connected officials. If access is the coin of the political realm, social connections to Mao yielded greater access to Mao for those who possessed it.

In order to investigate the relationship between social connections and the frequency of interactions between Mao and a provincial leader, we estimate the following equation where “Meetings” is the number of interactions between the leader and Mao:

$$Meetings_{jpt} = \beta_0 * Connection_{jt} + \beta_1 * Connection_{jt} * GLF_t + \gamma * X_{jt} + \mu_p + \lambda_t + \varepsilon_{jpt} \quad (3)$$

Here, the dependent variable, *Meetings*_{jpt}, is the number of interactions between Mao and provincial party leader *j* who served in province *p* and year *t*. In all specifications, we control for provincial fixed effects and year fixed effects.¹⁴ Since certain forms of interactions (such as participating in high level conferences) may be directly related to a provincial leader’s political rank and seniority, we additionally include a provincial leader’s age, age squared, years of tenure in the CCP, years of tenure squared, and dummies for the leader’s political rank as covariates. The effects of all covariates are allowed to be different in non-GLF years. In [Table 7](#), each column corresponds to a different definition of the Meetings variable, going from the most inclusive in Column 1 to the most restrictive (only correspondence) in Column 5. In all five specifications, the intensity of interactions between provincial leaders and Mao is significantly greater, roughly double the mean value in the sample, for connected leaders during the GLF. While it might have seemed more reasonable to find that access to Mao was greater for connected leaders both during and outside of the GLF period, our results suggest that Mao may have exerted more pressure on members of his patron-client

¹⁴ We do not further include individual fixed effect because 43 out of 48 provincial party leaders only served in one province during the sample period. There is therefore, not enough variation within province and leader to be exploited.

network to do his bidding. If this interpretation is correct, and there is unfortunately no direct manner of testing it, it would indicate that connected leaders had less discretion, because of direct supervision by Mao during the GLF, not to follow his radical policies.

Table 7 about here.

5. Alternative Explanations

The competency-loyalty tradeoff

An alternative explanation for our findings is that connected provincial leaders were on average of lower ability than unconnected ones. The literature on bureaucratic selection has often noted that incumbent leaders may face tradeoffs between the competency and the loyalty of their subordinates (Egorov and Sonin 2011, Colonnelli et al. 2017). If social ties to Mao were a substitute for competency in terms of a leader's appointment, it might well be the case that connected leaders were less qualified and therefore less able to handle the famine, thereby leading to a greater loss of life in the jurisdictions under their control. To test for this hypothesis, we interact our main explanatory variable (the interaction of the connected to Mao dummy with the GLF dummy) with two rough proxies for a provincial leader's ability. The first is whether the provincial leader had at least a high school education. The second is whether the provincial leader had above-median years of experience as a provincial leader. If this lack of competence led to higher mortality, we would expect the mortality effect of being connected to Mao to be attenuated. However, the results presented in **Appendix Table 7 point against this hypothesis, showing that the mortality effect during the GLF period of being connected to Mao actually tend to be greater and statistically more significant for those who were more educated or experienced.** This may suggest that provincial party leaders with higher ability and more experience were more able to mobilize resources in support of Mao's policies.

Ideological similarity

A second alternative interpretation of our results is that provincial party leaders who were historically connected to Mao were more similar to Mao in terms of ideology. In this scenario, the leaders in question implemented Mao's GLF policies with greater assiduity simply because they believed that

they were indeed appropriate. We consider this possibility by taking a closer look at the pattern of mortality effects by year. To do so, we estimate an augmented version of equation (1), where the effect of being connected to Mao is allowed to vary by year. [Appendix Table 8](#) presents estimates which generalize the four specifications of [Table 2](#). Figure 4 plots the estimated effects from the specification given by column (4). If connected provincial leaders put more effort into implementing GLF policies simply because they believed they were the appropriate policies, we would expect the mortality effects of being connected to Mao to be relatively stable throughout the GLF years. However, [Figure 4](#) shows that the pattern of the effects is remarkably consistent with what we know about the political dynamics of the central leadership during these years.

As noted earlier, Mao himself recognized the mistakes of his GLF policies at the end of 1958 and became aware of starvation and famine in some regions. He then introduced a number of adjustments designed to mitigate losses, including a reduction in steel production targets, returning the labor force to rural areas, and reducing the scope of the communal dining system (Xie 1996, 35). As a result, we see in Figure 4 that the effect on mortality of being connected to Mao falls slightly in magnitude and becomes statistically insignificant at usual levels of confidence when we move from 1958 to 1959. However, after Mao's confrontation with Defense Minister Peng Dehuai during the Lushan Conference, Mao believed his power had been seriously challenged. He purged Peng and Peng's sympathizers and decided to strike back by resuscitating the "Great Leap Forward" campaign and pushing it forward more forcefully. A reasonable presumption is that provincial leaders who were in a patron-client relationship with him would signal their loyalty through greater zealousness after the Lushan event. This is indeed what appears in Figure 4: the effect on mortality of being connected to Mao peaked in 1960, the year after Lushan, rising from a 4.5 to **13.2 deaths per thousand**. The Chinese population thereby fell by 10 million people in the single year of 1960. Mao finally accepted the failure of the Great Leap Forward in 1961 and publicly admitted his mistakes in a state conference in 1962, the year when the campaign officially came to an end. The estimated effects in Figure 4 also become statistically indistinguishable from zero after that year. The upshot is that the temporal pattern of mortality effects revealed by Figure 4 is consistent with our interpretation based on political patronage and is difficult to reconcile with an ideological similarity hypothesis.

Figure 4 about here.

6. Conclusion

In its reliance on mass mobilization and the delegation of implementation to provincial leaders, the Great Leap Forward was fundamentally at variance with the spirit of Soviet-style central planning. Mao could not rely solely on the central bureaucrats to promote his vision. Mao traveled extensively on his special train throughout the provinces, talking up the policies and praising various practices of the Great Leap Forward (MacFarquhar 1983). This was Mao's version of a military campaign in peacetime. He was charming to followers, cajoling laggards, while absorbing some of what he saw and heard. The empirical results presented in this paper suggest, in rallying political support for the Great Leap Forward, that Mao, the master political strategist and manipulator, relied on provincial leaders who were in his own social network—people he had already placed in many provincial leadership positions beforehand.

Our measure of membership in Mao's patron-client network, which is based on a leader's being connected to him by geographical origin, a student-teacher relationship or common revolutionary experiences, is manifestly imperfect. But the systematic, and quantitatively large, impact that this measure has on mortality, fertility, radical policies associated with the Great Leap Forward and promotion within the CCP hierarchy is almost impossible to attribute to mere chance. Our measure of membership in Mao's patron-client network is also strongly correlated with independent measures of the degree of interpersonal interaction during the GLF period between Mao and the provincial leaders in question, strongly suggesting that our measure had operational overtones and was not simply some nostalgic holdover from a distant past. We have also done our best, given available data, to eliminate sources of unobserved heterogeneity that could be confounding our results. Our findings are also orthogonal with respect to competing explanations based on a competency-loyalty tradeoff or mere ideological similarity between Mao and the members of his network.

The magnitude of the effects associated with belonging to Mao's patron-client network are, to put it mildly, quite staggering: a province with a leader connected to Mao according to our measure experienced, *ceteris paribus*, a mortality rate that was 40 percent higher. Our explanation provides a coherent explanation for several puzzles that have not hitherto been satisfactorily answered within a single framework in the existing literature. The heterogeneity across provincial leaders in terms of their membership in Mao's patron-client network explains (i) why policies were implemented with differing intensities in different provinces, (ii) why the impact on mortality and fertility was so different across provinces or counties and, most importantly in the context of the functioning of the Chinese Communist

Party, (iii) why these outcomes were perfectly consistent with the career incentives facing the provincial leaders who were ultimately responsible for the difference between life and death for millions of people.

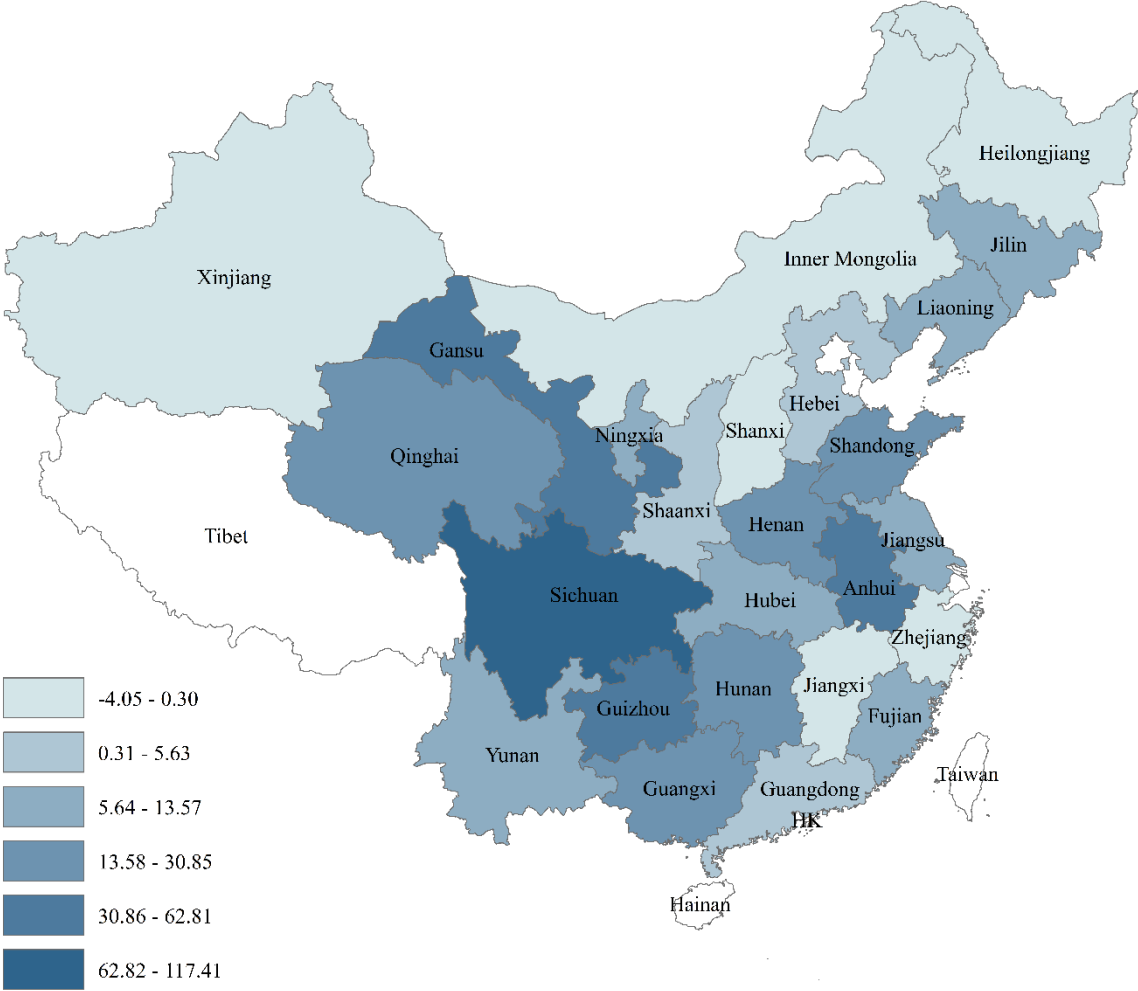


Figure 1. (Cumulative) Excess Mortality during the Great Leap Famine, 1958-1962

Notes: This figure depicts the distribution of excess famine deaths across provinces during 1958-1962. The annual excess mortality rate is the difference between the annual mortality rate during the famine period (1958-1962) and the average mortality rate for 1955-1957. The cumulative excess mortality rate is defined as the sum of annual excess mortality rate over 1958-1962.

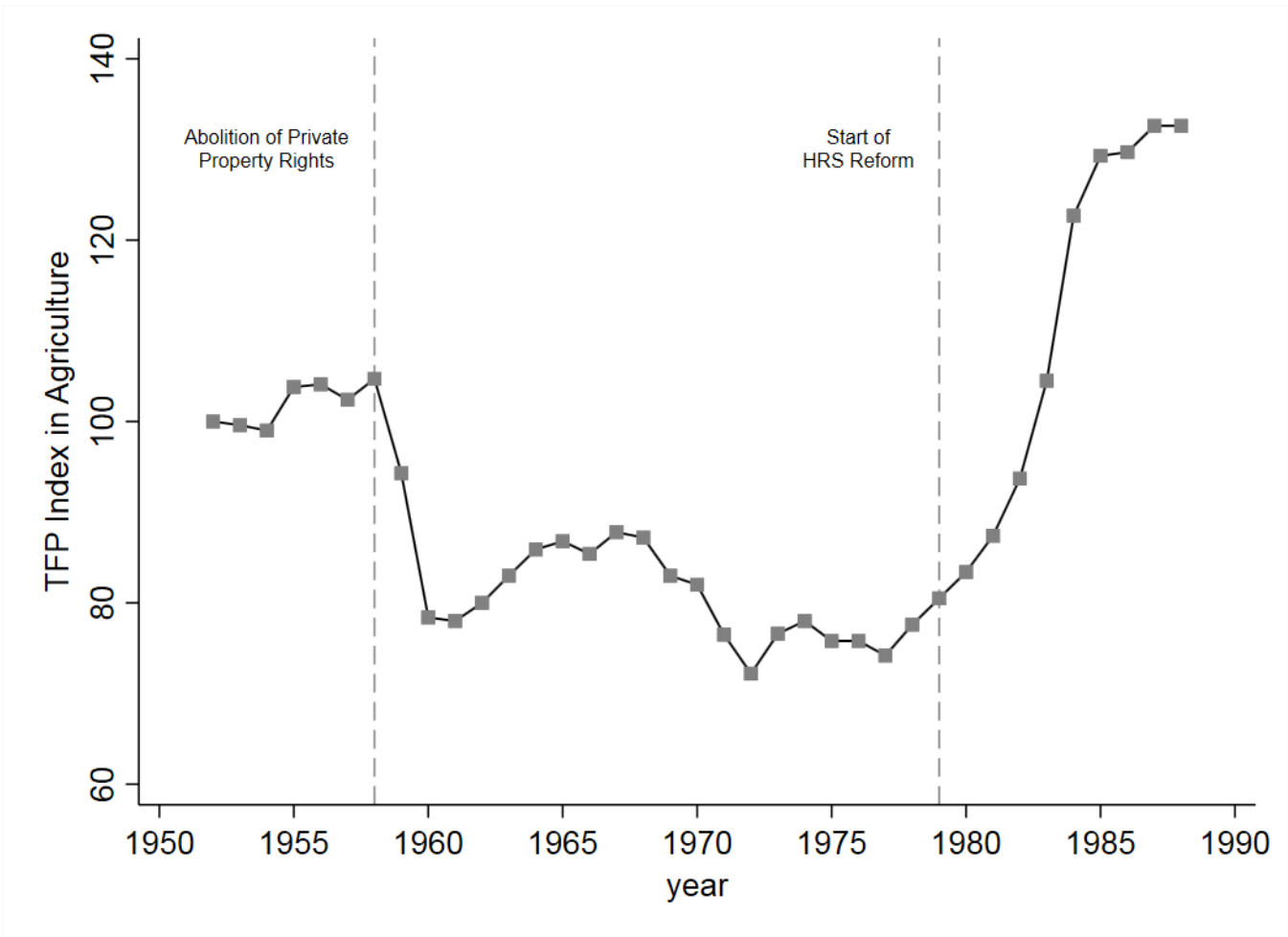


Figure 2. Total Factor Productivity (TFP) index in Agriculture, 1952-1988

Notes: This figure plots the TFP index in Chinese agriculture by year. TFP in 1952 (base year) is normalized to 100. Data drawn from Lin (1990).

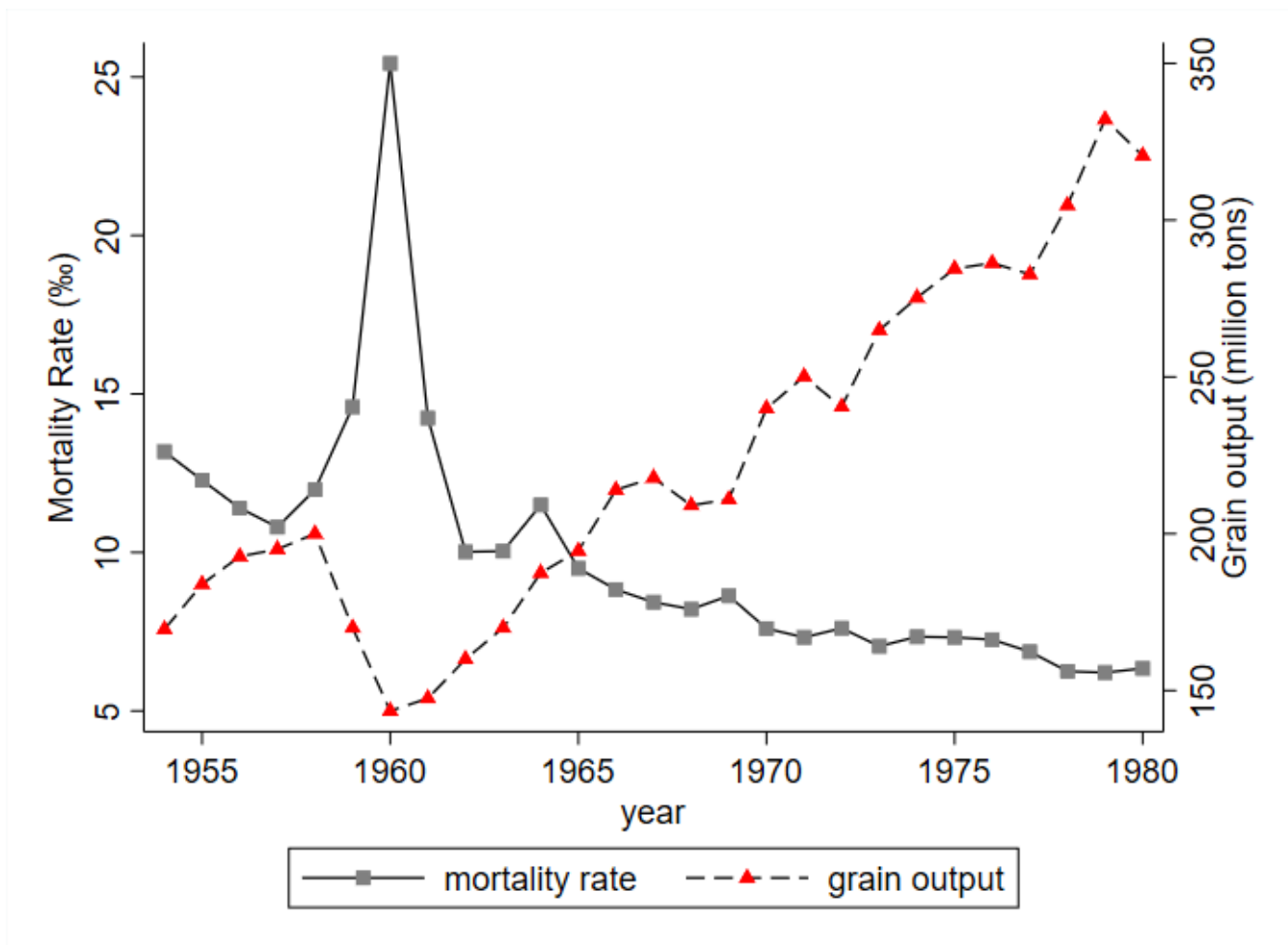


Figure 3. National Mortality Rates and Grain Output, 1954-1980

Data source: *A Compilation of Historical Statistical Data of Provinces, Autonomous Regions, and Municipalities; Economic Data of Agriculture (Nongye Jingji Ziliao)*.

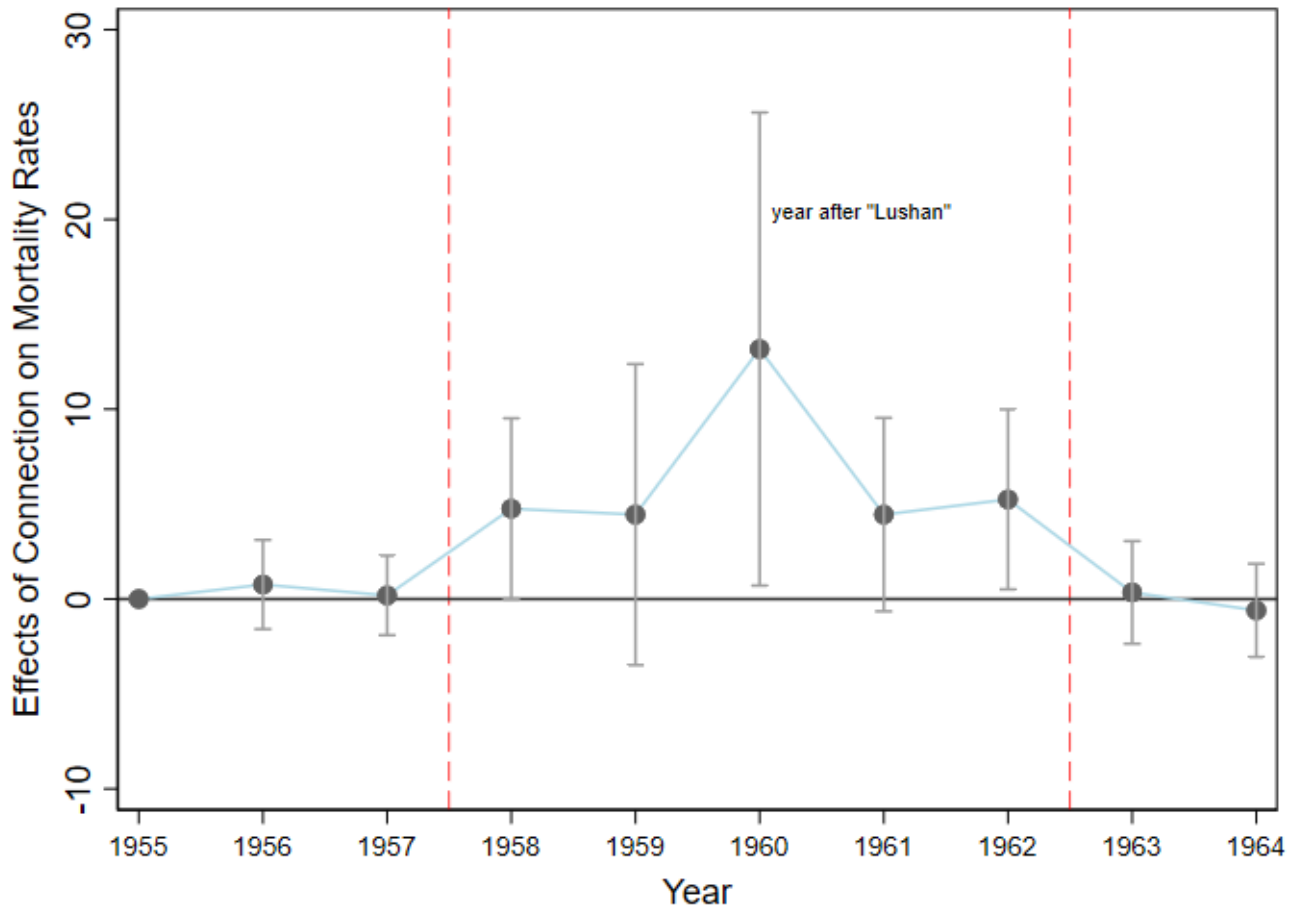


Figure 4. Effects of Connectedness (to Mao) on Mortality Rate, by year

Table 1: Summary Statistics

Panel A			
Provincial Leader Characteristics	Mean	SD	Observations
Connected	0.417	0.498	48
Birth Place tie	0.188	0.394	48
Schooling tie	0.125	0.334	48
Red Army tie	0.292	0.459	48
Year of Birth	1,908	5.551	48
Year of Joining the Party	1,929	3.819	48
Post-secondary Education	0.542	0.504	48
Long March Experience	0.375	0.489	48
Special Promotion in the 8th Central Committee	0.229	0.425	48
Normal Promotion in the 8th Central Committee	0.500	0.505	48
Panel B			
Province Characteristics	Mean	SD	Observations
Mortality Rate	13.04	6.928	275
Birth Cohort Size, log	8.625	0.835	275
Grain Output per capita, log	5.590	0.252	275
Share of Rural Population	0.823	0.092	275
Steel Output, log	1.267	2.405	222
Growth Rate of Grain Output	0.022	0.016	250
Net Procurement Ratio	0.177	0.086	275
Communal Dining Rate	0.647	0.260	25
Output Inflation Rate	1.169	0.701	22
Governed by a Connected Provincial Leader	0.404	0.492	275
Governed by a Native Provincial Leader	0.284	0.452	275
Interactions between the Provincial Leader and Mao	4.004	5.951	275

Table 2. Effects of Connectedness (to Mao) on Mortality Rates, 1954-1964

VARIABLES	Mortality Rates (death per thousand)			
	(1)	(2)	(3)	(4)
Connected	0.134 (0.719)	-0.497 (1.174)	0.078 (1.655)	-0.747 (2.066)
Connected * GLF	6.169** (2.585)	6.051** (2.754)	6.056** (2.405)	6.152*** (2.188)
<i>Joint: Connected + Connected * GLF</i>	6.303** (2.471)	5.553** (2.263)	6.134** (2.364)	5.405** (2.544)
Mean of dep. var. (per thousand)	13.04	13.04	13.04	13.04
Observations	275	275	250	250
R-squared	0.407	0.522	0.579	0.593

Note: Unit of observation is a province-year. Sample period is 1954-1964. Regressions control for provincial party leader's years of tenure in the party (to measure seniority, columns 1-4), an indicator for being a native of the province he governed (to account for regional favoritism, columns 1-4), provincial fixed effects (columns 2-4), the proportion of the population that is rural (to measure urbanization, columns 3-4), the log of grain output per capita in the previous year (to account for agricultural endowment, columns 3-4), and dummies for political rank indicating whether a provincial leader is a non-member, alternate member, or full member of the Central Committee (column 4). Year fixed effects are included in all columns. GLF is a dummy for years 1958 – 1962. The effects of all covariates are allowed to vary in non-GLF years. Robust standard errors clustered at the province level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Table 3. Effects of Connectedness (to Mao) on *Provincial Birth Cohort Size*, 1954-1964

VARIABLES	Log Birth Cohort Size			
	(1)	(2)	(3)	(4)
Connected	0.273 (0.289)	-0.014 (0.046)	-0.064 (0.068)	-0.072 (0.069)
Connected * GLF	0.158 (0.318)	-0.194*** (0.069)	-0.171*** (0.049)	-0.174*** (0.049)
<i>Joint: Connected + Connected * GLF</i>	0.431 (0.290)	-0.209*** (0.074)	-0.234*** (0.083)	-0.246*** (0.078)
Mean of dep. var. (per thousand)	8.625	8.625	8.625	8.625
Observations	275	275	250	250
R-squared	0.193	0.981	0.985	0.986

Note: Unit of observation is the province-year. Sample period is 1954-1964. Regressions control for provincial party leader's years of tenure in the party (to measure seniority, columns 1-4), an indicator for being a native of the province he governed (to account for regional favoritism, columns 1-4), provincial fixed effects (columns 2-4), the proportion of rural population (to measure urbanization, columns 3-4), the log of grain output per capita in the previous year (to account for agricultural endowment, columns 3-4), and dummies for political rank indicating whether a provincial leader is a non-member, alternate member, or full member of the Central Committee (column 4). Year fixed effects are included in all columns. GLF is a dummy for years 1958 – 1962. The effects of all covariates are allowed to vary in non-GLF years. Robust standard errors clustered at the province level in parentheses (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

Table 4. Effects of Connectedness (to Mao) on *County* Birth Cohort Size, 1954-1964

VARIABLES	All Counties		Border Counties		Border Counties	
	(1)	(2)	(3)	(4)	(5)	(6)
Connected	-0.041 (0.050)	-0.022 (0.057)	-0.036 (0.040)	-0.037 (0.044)	-0.045 (0.034)	-0.048 (0.036)
Connected * GLF	-0.209*** (0.071)	-0.222*** (0.072)	-0.215*** (0.054)	-0.227*** (0.057)	-0.106*** (0.036)	-0.109*** (0.038)
<i>Joint: Connected + Connected * GLF</i>	-0.249*** (0.067)	-0.244*** (0.075)	-0.252*** (0.069)	-0.264*** (0.074)	-0.152*** (0.046)	-0.158*** (0.046)
County FEs	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	N	N
County-Pair FEs	N	N	Y	Y	N	N
County-Pair * Year FEs	N	N	N	N	Y	Y
Mean of dep. var.	3.921	3.450	3.875	3.734	3.875	3.734
Observations	26,972	26,972	16,724	16,724	16,724	16,724

Note: Sample period is 1954-1964. Columns 1 and 2 use the all-counties sample, including county and year fixed effects. Columns 3-6 use the contiguous border county-pair sample. Columns 3-4 control for county, county-pair, and year fixed effects. Columns 5-6 control for county and county pair by year fixed effects. Columns 1, 3, and 5 use the log of birth cohort size and columns 2, 4, and 6 use the log of birth cohort size in agriculture as the dependent variables. Provincial leader's years of tenure in the party (to measure seniority) and an indicator for being a native of the province he governed (to account for regional favoritism) are included in all specifications. GLF is a dummy for years 1958 – 1962. The effects of all covariates are allowed to vary in non-GLF years. Standard errors in parentheses are clustered at the province level for specifications 1-2 and are clustered on the province *and* border segment levels for specifications 3-6 (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

Table 5. Effects of Connectedness (to Mao) on GLF Policy Intensity, 1954-1964

VARIABLES	Log Steel Output	Growth Rate of Grain Output	Net Procurement ratio	Communal Dining Rate (1959)	Output Inflation Rate (1958)
	(1)	(2)	(3)	(4)	(5)
Connected	-0.172 (0.416)	-3.507 (2.562)	0.959 (2.079)	23.36** (10.30)	54.28** (24.49)
Connected * GLF	1.034** (0.419)	-2.477 (2.608)	-2.209 (2.186)		
<i>Joint: Connected + Connected * GLF</i>	0.862** (0.385)	-5.983*** (1.903)	-1.251 (2.290)		
Mean of dep. var.	1.267	2.203	17.65	64.67	116.9
Observations	222	250	275	25	22
R-squared	0.902	0.424	0.819	0.263	0.436

Note: Columns 1-3 use data from 1954 - 1964; column 5 and 6 use data for 1959 and 1958, respectively. Regressions control for provincial party leader's years of tenure in the party (to measure seniority, columns 1-5), an indicator for being a native of the province he governed (to account for regional favoritism, columns 1-5), provincial fixed effects (columns 1-3), year fixed effects (columns 1-3). GLF is a dummy for year 1958 – 1962. The effects of all controls are allowed to vary in non-GLF years in columns 1-3. Robust standard errors clustered at the province level in parentheses. Robust standard errors clustered at the province level appear in parentheses of columns 1-3. Huber-White robust standard errors in parentheses of column 4 and 5 (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

Table 6. The Determinants of Promotion in Central Committee

VARIABLES	Promotion (0 - Career stagnation, 1 - Normal promotion, 2 - Special promotion)					
	(1)	(2)	(3)	(4)	(5)	(6)
Connected	1.182*** (0.370)				1.587*** (0.435)	1.464*** (0.442)
Birth place tie		1.003*** (0.363)				
Schooling tie			1.471*** (0.514)			
Red Army tie				0.761** (0.384)		
Year of Birth					0.016 (0.066)	0.014 (0.062)
Year of Joining the Party					-0.109 (0.086)	-0.093 (0.082)
Post-secondary Education					0.256 (0.381)	0.370 (0.394)
Long March Experience						0.844** (0.425)
<i>Marginal effects on special promotion (Promotion = 2)</i>						
Connected (ties)	0.302*** (0.083)	0.276*** (0.088)	0.382*** (0.112)	0.216** (0.103)	0.322*** (0.065)	0.279*** (0.058)
<i>Marginal effects on career stagnation (Promotion = 0)</i>						
Connected (ties)	-0.340*** (0.090)	-0.316*** (0.121)	-0.462*** (0.169)	-0.240** (0.114)	-0.338*** (0.100)	-0.289*** (0.086)

Note: Sample includes 48 individuals who had ever served as a provincial party leader between our sample periods 1954-1964. Dummies for provincial leaders' original political rank (whether a provincial leader is a non-member, alternate member, or full member of the 7th Central Committee) are included in specifications 5 and 6. Marginal effects of connectedness and each specific tie are reported in the bottom two panels. Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Table 7. Connectedness to Mao and Frequency of Interactions with Mao, 1954–1966

VARIABLES	Total No. of Interactions	Total Excluding State and CC conferences	Further excluding visits and recreational events	Private conversation and correspondence	Correspondence only
	(1)	(2)	(3)	(4)	(5)
Connected	-0.170 (1.164)	0.258 (0.994)	0.276 (0.962)	0.299 (0.472)	0.021 (0.096)
Connected * GLF	4.177** (1.766)	3.153** (1.409)	2.722** (1.300)	1.506** (0.715)	0.489** (0.177)
<i>Joint: Connected + Connected * GLF</i>	4.008** (1.696)	3.411** (1.478)	2.998** (1.409)	1.806** (0.705)	0.510** (0.210)
Mean of dep. var.	4.004	3.578	3.312	1.480	0.211
Observations	275	275	275	275	275
R-squared	0.678	0.687	0.683	0.594	0.369

Note: Interactions between provincial party leaders and Mao are classified into 5 types: 1) attending regular Supreme State Conference and Central Committee conferences held by Mao; 2) accompanying Mao on domestic and foreign visits and recreational events (dinner, film etc.); 3) requested to attend irregular conferences called by Mao; 4) having private conversations with Mao; 5) correspondence with Mao (mail, comments on and reply to reports etc.) Column 1 uses total numbers of interactions including all 5 types as the dependent variable; column 2 excludes type 1 communication; column 3 further excludes type 2; column 4 further excludes type 3; column 5 only includes type 5 communication. Provincial leader's age, age square, years of tenure in the party, years of tenure square, and dummies for their political rank are included in all specifications. GLF is a dummy for years 1958 – 1962. The effects of all covariates are allowed to vary in non-GLF years. Standard errors clustered at the province level in parentheses (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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Appendix

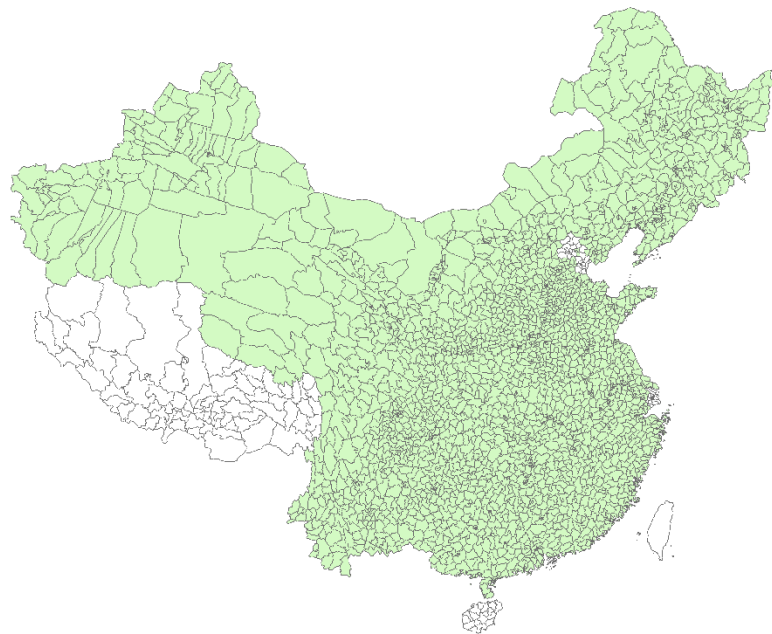


Figure A1 (a). All-counties sample.



Figure A1 (b). Border-counties sample.

Table A1: Provincial Party Leaders' Social Ties to Mao

Secretary Name	Province Name	Birthplace Ties	Schooling Ties	Red Army Ties	Description
叶剑英	广东	0	0	1	1932, 1935 红一方面军参谋长
吴芝圃	河南	0	1	0	1926, 广州农民运动讲习所
周小舟	湖南	1	0	0	Hunan
张仲良	甘肃, 宁夏	0	0	1	1935,1936 红一方面军十五军团 78 师
张平化	湖南	1	0	0	Hunan
张鼎丞	福建	0	0	1	1929, 1930 红四军
曾希圣	安徽	1	1	1	Hunan; 1937 抗日军政大学; 1932 红一方面军第二局
李井泉	四川	0	0	1	1931 红一方面军独立第三师
柯庆施	江苏	0	0	1	1930, 1931 红一方面军第三军团
欧阳钦	黑龙江	1	0	1	Hunan; 1935 红一方面军第三军团
江华	浙江	1	1	1	Hunan; 1937 抗日军政大学; 1930-1937 红一方面军第三军团
江渭清	江苏	1	0	0	Hunan
胡耀邦	陕西	1	1	1	Hunan; 1937 抗日军政大学; 1935 红三军团
舒同	山东	0	0	1	1930-1935, 红四军, 红一方面第一军团
苏振华	贵州	1	1	1	Hunan; 1937 抗日军政大学;
谢富治	云南	0	1	0	1937 抗日军政大学
阎红彦	云南	0	0	1	1935, 1936 红一方面军第三十军
陈漫远	广西	0	0	1	1931, 1932 红一方面军第一军团
陶铸	广东	1	0	0	Hunan
黄欧东	辽宁	0	0	1	1930, 红四军, 红一方面军第一军团

Table A2: Baseline Characteristics and the Assignment of Connected Provincial Leaders

VARIABLES	Governed by a connected party leader = 1			
	(1)	(2)	(3)	(4)
Log population * non-GLF	-0.314 (0.386)			
Log population * GLF	-0.239 (0.369)			
Log grain output * non-GLF	0.526 (0.405)			
Log grain output * GLF	0.552 (0.399)			
Log grain output per capita * non-GLF		0.472 (0.466)		0.157 (0.533)
Log grain output per capita * GLF		0.361 (0.502)		0.228 (0.548)
Log GDP per capita * non-GLF		-0.391 (0.293)		-0.175 (0.370)
Log GDP per capita * GLF		-0.415 (0.341)		-0.309 (0.371)
Share of Agricultural GDP * non-GLF		-0.011 (0.008)		-0.014 (0.009)
Share of Agricultural GDP * GLF		-0.008 (0.009)		-0.007 (0.010)
Time of Liberation # non-GLF			0.010 (0.015)	0.021 (0.016)
Time of Liberation # GLF			-0.001 (0.017)	0.001 (0.019)
Distance from Beijing # non-GLF			0.160 (0.168)	0.086 (0.168)
Distance from Beijing # GLF			0.169 (0.191)	0.108 (0.172)
Mean of dep. var. (%)	0.404	0.404	0.404	0.404
Observations	275	275	275	275
R-squared	0.218	0.083	0.090	0.132

Note: Sample period is 1954-1964. Dependent variable is a dummy that equals 1 if a province is under a party leader connected to Mao. GLF is a dummy for famine years 1958 – 1962. non-GLF is a dummy for non-GLF years. Provincial characteristics are measured in the year of 1954. Time of “Liberation” is the number of months that elapsed from November 1947, the month the first province was declared “liberated” by the CCP, until the month the particular province was liberated (Yang 1996; Kung and Lin 2003). Distance from Beijing is the straight-line distance from provincial capital to Beijing. All regression models control for year fixed effect. Robust standard errors clustered at the province level in parentheses (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

Table A3. Effects of Connectedness (to Mao) on *Log Mortality Rates*, 1954-1964

VARIABLES	Log of Mortality Rates (deaths per thousand)			
	(1)	(2)	(3)	(4)
Connected	0.010 (0.059)	-0.046 (0.063)	-0.042 (0.083)	-0.070 (0.101)
Connected * GLF	0.289** (0.120)	0.279** (0.129)	0.305** (0.113)	0.309*** (0.106)
<i>Joint: Connected + Connected * GLF</i>	0.299** (0.111)	0.233* (0.115)	0.263** (0.121)	0.239* (0.130)
Mean of dep. var. (per thousand)	2.492	2.492	2.492	2.492
Observations	275	275	250	250
R-squared	0.441	0.604	0.666	0.676

Note: Unit of observation is the province-year. Sample period is 1954-1964. Regressions control for provincial party leader's years of tenure in the party (to measure seniority, columns 1-4), an indicator for being a native of the province he governed (to account for regional favoritism, columns 1-4), provincial fixed effects (columns 2-4), the proportion of rural population (to measure urbanization, columns 3-4), the log of grain output per capita in the previous year (to account for agricultural endowment, columns 3-4), and dummies for political rank indicating whether a provincial leader is a non-member, alternate member, or full member of the Central Committee (column 4). Year fixed effects are included in all columns. GLF is a dummy for years 1958 – 1962. The effects of all covariates are allowed to vary in non-GLF years. Robust standard errors clustered at the province level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Table A4. Effects of (*Recoded*) Connectedness (to Mao) on Famine Severity, 1954-1964

VARIABLES	Mortality Rates			Log Birth Cohort Size		
	(1)	(2)	(3)	(4)	(5)	(6)
Connected	-1.221 (1.138)	-0.724 (1.635)	-1.381 (1.758)	0.015 (0.048)	-0.031 (0.067)	-0.029 (0.065)
Connected * GLF	5.638* (3.049)	5.864** (2.724)	6.400** (2.594)	-0.184** (0.075)	-0.168*** (0.052)	-0.176*** (0.056)
<i>Joint: Connected + Connected * GLF</i>	4.417* (2.569)	5.140* (2.605)	5.019* (2.658)	-0.168* (0.083)	-0.199** (0.086)	-0.205** (0.084)
Mean of dep. var.	13.04	13.04	13.04	8.625	8.625	8.625
Observations	275	250	250	275	250	250
R-squared	0.515	0.574	0.594	0.980	0.985	0.985

Note: Unit of observation is the province-year. Sample period is 1954-1964. Regressions control for provincial party leader's years of tenure in the party (to measure seniority, columns 1-6), an indicator for being a native of the province he governed (to account for regional favoritism, columns 1-6), provincial fixed effects (columns 1-6), the proportion of rural population (to measure urbanization, columns 2, 3, 5, and 6), the log of grain output per capita in the previous year (to account for agricultural endowment, columns 2, 3, 5, and 6), and dummies for political rank indicating whether a provincial leader is a non-member, alternate member, or full member of the Central Committee (columns 3 and 6). Year fixed effects are included in all columns. GLF is a dummy for years 1958 – 1962. The effects of all covariates are allowed to vary in non-GLF years. Robust standard errors clustered at the province level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Table A5. Effects of Connectedness (to Mao) on Famine Severity, 1954-1966

VARIABLES	Mortality Rates			Birth Cohort Size		
	(1)	(2)	(3)	(4)	(5)	(6)
Connected	0.669 (1.015)	1.103 (1.095)	0.259 (1.489)	-0.061 (0.050)	-0.094 (0.059)	-0.105 (0.065)
Connected * GLF	5.635** (2.630)	5.537** (2.277)	5.828** (2.104)	-0.188** (0.068)	-0.152*** (0.051)	-0.164*** (0.055)
<i>Joint: Connected + Connected * GLF</i>	6.305** (2.355)	6.640*** (2.069)	6.088*** (2.128)	-0.248*** (0.081)	-0.246*** (0.076)	-0.269*** (0.078)
Mean of dep. var.	12.45	12.45	12.45	8.677	8.677	8.677
Observations	325	300	300	325	300	300
R-squared	0.533	0.589	0.604	0.980	0.984	0.985

Note: Unit of observation is the province-year. Sample period is 1954-1966. Regressions control for provincial party leader's years of tenure in the party (to measure seniority, columns 1-6), an indicator for being a native of the province he governed (to account for regional favoritism, columns 1-6), provincial fixed effects (columns 1-6), the proportion of rural population (to measure urbanization, columns 2, 3, 5, and 6), the log of grain output per capita in the previous year (to account for agricultural endowment, columns 2-3, 5-6), and dummies for political rank indicating whether a provincial leader is a non-member, alternate member, or full member of the Central Committee (columns 3 and 6). Year fixed effects are included in all columns. GLF is a dummy for years 1958 – 1962. The effects of all covariates are allowed to vary in non-GLF years. Robust standard errors clustered at the province level in parentheses (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

Table A6. List of Promoted Provincial Party Leaders

Secretary Name	Province Name	Original Rank	Rank in 1958	Promotion (1-normal 2-special)
乌兰夫	内蒙	1	2	1
刘建勋	广西, 河南	0	1	1
叶飞	福建	0	1	1
吴德	吉林	0	1	1
吴芝圃	河南	0	2	2
周小舟	湖南	0	1	1
张仲良	宁夏, 甘肃	0	1	1
张平化	湖南	0	1	1
张德生	陕西	0	1	1
曾希圣	安徽	0	2	2
李井泉	四川	0	2	2
李大章	贵州	0	1	1
李葆华	安徽	1	2	1
林铁	河北	0	2	2
柯庆施	江苏	0	2	2
欧阳钦	黑龙江	0	2	2
江华	浙江	0	1	1
江渭清	江苏	0	1	1
汪锋	宁夏, 甘肃	0	1	1
潘复生	河南	0	1	1
潘自力	陕西	0	1	1
王任重	湖北	0	1	1
王恩茂	新疆	0	2	2
胡耀邦	陕西	0	2	2
舒同	山东	0	2	2
苏振华	贵州	0	1	1
谢富治	云南	0	2	2
谭启龙	山东, 浙江	0	1	1
阎红彦	云南	0	1	1
陈漫远	广西	0	1	1
陶铸	广东	0	2	2
陶鲁笏	山西	0	1	1
韦国清	广西	0	1	1
黄欧东	辽宁	0	1	1
黄火青	辽宁	0	1	1

Table A7. Different Effects of Connectedness (to Mao) on Mortality Rates, by Education and Experience

VARIABLES	Mortality Rates		Log Birth Cohort Size	
	(1)	(2)	(3)	(4)
Connected * GLF	3.816 (2.256)	3.156 (2.157)	-0.105* (0.056)	-0.151*** (0.040)
Connected * GLF * Edu	4.996 (4.841)		-0.172 (0.101)	
Connected * GLF * Exp		6.506* (3.733)		-0.031 (0.095)
<i>Joint: Connected * GLF + Connected * GLF * X</i>	8.812** (4.076)	9.662*** (3.303)	-0.276*** (0.079)	-0.182* (0.091)
Mean of dep. var.	13.04	13.04	8.625	8.625
Observations	250	250	250	250
R-squared	0.605	0.613	0.988	0.987

Note: Unit of observation is the province-year. Sample period is 1954-1964. "Edu" and "Exp" are dummies for whether a provincial party leader has above-median education level and years of experience as a party leader, respectively. GLF is a dummy for years 1958 – 1962. Regressions control for provincial party leader's years of tenure in the party (to measure seniority), an indicator for being a native of the province he governed (to account for regional favoritism), provincial fixed effects, year fixed effects, the proportion of rural population (to measure urbanization), the log of grain output per capita in the previous year (to account for agricultural endowment), dummies for political rank indicating whether a provincial leader is a non-member, alternate member, or full member of the Central Committee, and full interactions between "Connected", "GLF", and "Edu" / "Exp". The effects of all covariates are allowed to vary in non-GLF years. Robust standard errors clustered at the province level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Table A8. Effects of Connectedness (to Mao) on Mortality Rates, by year

VARIABLES	Mortality Rates (death per thousand)			
	(1)	(2)	(3)	(4)
Connected * Year55	1.903 (1.188)	1.803 (1.282)		
Connected * Year56	2.529* (1.244)	2.526* (1.364)	0.973 (1.109)	0.765 (1.139)
Connected * Year57	1.743 (1.316)	1.755 (1.358)	0.093 (0.993)	0.190 (1.016)
Connected * Year58	5.866* (2.851)	6.070* (2.999)	5.232** (2.511)	4.760* (2.309)
Connected * Year59	6.609 (4.126)	6.603 (4.408)	4.883 (4.019)	4.449 (3.843)
Connected * Year60	15.175** (6.117)	15.147** (6.604)	13.235** (6.046)	13.171** (6.039)
Connected * Year61	5.048 (3.378)	5.193 (3.428)	4.347 (2.583)	4.449* (2.469)
Connected * Year62	5.353** (2.234)	6.400** (2.353)	5.062** (2.325)	5.249** (2.297)
Connected * Year63	2.160 (1.491)	3.201** (1.426)	0.919 (1.448)	0.348 (1.310)
Connected * Year64	1.208 (1.525)	2.249 (1.439)	-0.025 (1.274)	-0.599 (1.190)
Mean of dep. var. (per thousand)	13.04	13.04	13.04	13.04
Observations	275	275	250	250
R-squared	0.442	0.555	0.605	0.620

Note: Unit of observation is the province-year. Sample period is 1954-1964. Regressions control for provincial party leader's years of tenure in the party (to measure seniority, columns 1-4), an indicator for being a native of the province he governed (to account for regional favoritism, columns 1-4), provincial fixed effects (columns 2-4), the proportion of rural population (to measure urbanization, columns 3-4), the log of grain output per capita in the previous year (to account for agricultural endowment, columns 3-4), and dummies for political rank indicating whether a provincial leader is a non-member, alternate member, or full member of the Central Committee (column 4). Year fixed effects are included in all columns. GLF is a dummy for famine years 1958 – 1962. The effects of all covariates are allowed to vary in non-GLF years. Robust standard errors clustered at the province level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).