

Factions in Nondemocracies: Theory and Evidence from the Chinese Communist Party

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Abstract

This paper theoretically and empirically investigates factional arrangements within the Chinese Communist Party (CCP), the governing political party of the People's Republic of China. Using detailed biographical information of political elites in the Central Committee and provincial governments, we present a set of new empirical regularities within the CCP, including systematic patterns of cross-factional balancing at different levels of the political hierarchy and substantial faction premia in promotions. We propose and estimate an organizational economic model to characterize factional politics within single-party nondemocratic regimes and its economic implications.

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1 Introduction

This paper presents a theoretical and empirical analysis of the internal organization of China’s political linchpin: the Chinese Communist Party (CCP). As the regime party of the People’s Republic of China (PRC), the CCP is, de jure and de facto, the be-all and end-all of political activity in the most populous country in the world today (Bai, Hsieh, and Song, 2016). This motivates the interest of political economists in the CCP and its factions.

The opaque and often informal nature of elite interaction in a country lacking competitive elections and with a rich history of informal politics raises formidable obstacles to a rigorous politico-economic analysis. The CCP remains today “*a secretive, selective organization of about 65 million members who have positions of influence in all sectors of Chinese society...*” (Nathan and Gilley, 2003 p.7). Operations of the Politburo and the highest echelons of the CCP have been often described as opaque at best (Pye, 1980; Dittmer, 1995; Shih, 2008). Within this context, intra-elite competition is extremely hard to assess. The economic literature on the internal organization at the highest levels of the Chinese government has been traditionally limited,¹ although with several recent exceptions (e.g. Li, Roland, and Xie, 2018; Chu, Fisman, Tan, and Wang, 2020; Fisman, Shi, Wang, and Wu, 2020). Political scientists focused on China studies have been more attentive, but also often more descriptive in their analysis, at least until recently.²

Scholars since Nathan (1973) have emphasized how the faction – intended as a patron-client cluster of mutually linked officials – represents the correct unit of analysis of elite politics in China. Despite the fact that the CCP officially rejects factional elite politics³, evidence supporting this interpretation has steadily accumulated (Pye, 1981; Dittmer and Wu, 1995; Nathan and Gilley, 2003; Shih, 2004; Li, 2012; Li, 2013; Shih, 2016; Meyer et al. 2016). This paper follows this line of inquiry, but with special attention paid to individual incentives, supplying an economic model where powerful factions arise endogenously from a combination of talented individuals and cohesive social ties. This framework captures the political tradition in China, where the government landscape is shaped by the gradual progression of individual politicians, rather than by sweeping electoral shifts as in Western democracies.

This paper has four goals. First, to provide novel stylized facts aimed at disciplining our understanding of the internal dynamics of the CCP in the last forty years. Second, to develop a tractable economic framework able to match and interpret these facts in a structural econometric sense. Third, to validate this approach, providing evidence of the model ability to match untargeted moments and good

¹The study of the political economy of China has several important exceptions, but often not precisely focused on national elite competition. Persico, Pueblita, and Silverman (2011) in their analysis of factional politics focus on the CCP, among their various case studies. Less relatedly, work such as Li and Zhou (2005) and Jia, Kudamatsu, and Seim (2015) focuses on the role of personal connections in promotion of provincial leaders. Work by Lau, Qian, and Roland (2000) models the process of reform under Deng Xiaoping and the reform era.

²Descriptive discussion most pertinent to this paper includes Li (2012, 2013). Several quantitative exceptions are discussed in Shih (2016) with respect to scholarship in East Asian studies and political science, while less recent examples include Huang (2000), Shih (2004, 2007); Shih, Adolph and Liu (2012).

³BBC, Monday January 5, 2015: “An editorial in Monday’s flagship newspaper, The People’s Daily, says cliques are akin to parasites and are ‘harmful for both the country and the people.’” <http://www.bbc.com/news/blogs-china-blog-30685782>

out-of-sample fit of recent changes in Chinese politics (with respect to the 19th Party Congress). These changes are not irrelevant for economists, granted China's growing geopolitical role and its substantial economic weight in international trade and global production. Fourth, to offer politico-economic counterfactual exercises.

In our model, a hierarchy of party positions is populated by politicians with different abilities and affiliations to different social groups. In this sense, the party hierarchy incorporates both meritocratic elements and factional forces, as suggested for instance by Jia et al. (2015). Different groups are characterized by different degrees of cohesion, determining how much members of the same group weight each other's welfare. When a politician retires, candidates from the level immediately below in the CCP pyramid compete for promotion, and politicians at other levels offer support to different candidates. Politicians from more cohesive groups optimally choose to behave in a more cooperative manner by exerting costly effort to support each other's promotion, which helps members to rise faster through the ranks. The ascendance of cofactional members to important positions, in turn, reinforces that faction's advantage, as more powerful cadres can exert greater influence in the promotion process. In this sense, cohesive social groups are more likely to develop into powerful political factions.

The positive feedback loop between the power of a faction and future promotions is dampened, however, by competition from politicians from other factions, who are wary of the dominance of one faction in each leadership node of the hierarchy. Specifically, once a politician is promoted to a leadership node, he or she will decide how much public goods to supply jointly with another politician who shares a comparable control of the position (as we will discuss, this diarchic structure is a pervasive feature of the Chinese state). A local monopoly by politicians from the same faction leads to under-supply of public goods and higher extraction of private benefits by the pair of cadres, which hurts economic performance. This economic mechanism has received deserved attention in the literature on corruption (see Shleifer and Vishny, 1993, Li, Roland, and Xie, 2018) and within our framework ties the individual career profiles of each politician to the interactions among the different factions. To avoid losses from local monopolies, politicians from other groups exert extra effort to prevent the dominance of one faction at each node in the government, inducing an endogenous form of checks and balances among groups. Factional checks and balances thus have aggregate economic consequences by affecting the prevalence of local collusion and the selection of capable politicians.⁴

Using a large biographical database of political elites in the Central Committee and provincial governments, we document a set of new empirical regularities which anchor our model. We start with four prominent factions and groups within the CCP in recent history, including CYLC (the Communist Youth League of China, related to General Secretary Hu Jintao), Shanghai Gang (affiliated most prominently with Jiang Zemin and bolstered by the special status of Shanghai in Chinese politics), Princelings (sons and daughters of prominent party officials and revolutionary veterans under Mao), and Military

⁴Highly collusive factions are potentially more deleterious to the economic system and the legitimacy of the CCP and they are kept under check by all others members of the party, who stand to lose from collusive behavior within adversary groups. In this sense, competition among factions within our model also operates as a collusion-checking device, providing self-reinforcing stability to the political system.

(politicians with a military background). A priori, we do not take a stance on which social groups are true factions, and which are not. Instead, we examine whether these groups display features that our theoretical notion of factions should possess, including the ability to deliver benefits to their members and checks and balances with other factions. A formal test is then proposed based on the structurally estimated faction cohesion parameters.

We present several empirical findings. In the data, only CYLC and Shanghai Gang display the characteristics of true factions. We find that affiliation to these groups, on average, increases one's chance of promotion comparing to unaffiliated politicians. Furthermore, the benefit of being a faction member is time-varying: when a faction member reaches higher levels of the party hierarchy, other faction members enjoy additional premia in promotions. The existence of precisely estimated faction premia points in the direction of factions being both appropriately identified within our analysis and of operative relevance within the party.

Consistent with our model, we also find systematic patterns of factional balancing at different levels of the CCP hierarchy. One faction rarely controls both of the top two positions at a node in the hierarchy. For instance, in the provincial government the top two positions are Provincial Party Secretary and Provincial Governor. We find that if the Party Secretary is from one faction, the Governor is exceedingly unlikely to be from the same faction.

To uncover deep parameters that generate these promotion patterns and cross-faction matching in different levels of governments, we estimate our model structurally. Based on this model, whether a political group functions as a faction depends on its cohesion, which we can estimate with precision from the data. We find that, consistently with the informal narratives (e.g., Li (2002)) and our reduced-form estimates, CYLC and Shanghai Gang exhibit substantial positive group cohesion. Importantly, we also reject at standard confidence levels the hypothesis that the Princeling group (to which both Xi Jinping and the disgraced former Governor Bo Xilai belong) and the Military group act as unified factions in our sample period. In addition to providing a formal test of whether certain political groups rise to the level of cohesion of political factions, our structural estimates also reveal the distribution of power along the party hierarchy. We find that the supreme leader, on average, accounts for 16.5 percent of the influence in the selection process of the Central Committee members, while a Politburo Standing Committee member accounts for 8 percent. Collectively, the eight highest-ranked leaders account for 72.5 percent of the total support, and the rank and file accounts for the remaining 27.5 percent. The substantial influence of the supreme leader and Politburo Standing Committee members is consistent with a top-heavy selection process in China. Nevertheless, the supreme leader is far from having absolute control, suggesting that elite politics in China is consistent with a "collective leadership" system that emerged after Deng Xiaoping, at least for the period up to the 18th Party Congress in 2017. Our model is further validated via an assessment of out-of-sample performance when applied to Central Committee data of the Fall of 2017, in the aftermath of the 19th Party Congress of the CCP.

Given China's rise to world power status over the last thirty years, the relative scarcity of formal and rigorous analyses of its internal political structure represents a gap in our understanding of an organiza-

tion governing billions of people. Our paper contributes to the politico-economic literature on Chinese elite politics and attempts to provide a robust framework to understand its central organization. Political observers and popular media often use attributes such as college, hometown, or family background to group similar politicians into CCP “factions”. This leads to a plethora of putative “factions”, such as Tsinghua Clique, Shaanxi Clique, and Princelings. An ongoing debate in the literature is which of these social groups may be relevant political units in China and which not (Shih, Adolph, and Liu, 2012; Jia et al., 2015, Fisman et al., 2020).⁵ While we also focus on systematic biographical information, we remain wary of potential mismeasurement in the identification of factional ties, as is likely for factional affiliation based purely on place of birth or shared career paths. An important reason for this wariness is evident in our statistical analysis. Based on a minimal set of factions that are well established in the extant discussion of Chinese elite politics, we find that politicians working in the same department or party branches are not necessarily from the same faction. Instead, if they have a similar rank, they are actually more likely to belong to different factions. Simply sharing part of their career paths may not be informative of factional affiliation for CCP elite officials. Interestingly, this is also consistent with complementary evidence exploiting hometown ties of politicians in the Politburo (Fisman et al. 2020). In addition to documenting reduced-form regularities displayed by factions, we also provide a formal structure and tests of whether certain political groups raise to the level of cohesion of political factions. To the best of the authors’ knowledge, this is the first of its kind in the literature.

This paper speaks to the literature on the internal organization of elites in nondemocratic regimes. This is a vast area of research and Egorov and Sonin (2020), Newson and Trebbi (2018), and Gelbach et al. (2016) offer theoretical and empirical reviews. Among many, relevant instances include Li, Roland and Xie (2018) who offer a detailed analysis of the Chinese case complementary to ours, focusing specifically on rent-seeking behavior within the hierarchy, and Francois et al. (2015, 2016) addressing the internal organization of elites in African dictatorships.

Closest to our specific focus on factions is Persico et al. (2011), who present a theoretical model of endogenous factional growth in a hybrid democracy with competitive elections, and link it qualitatively to evidence from factional local politics in Mexico within the Institutional Revolutionary Party.⁶ In Persico et al. (2011), promotions of members from the same faction are bound together, depending on the outcome of local elections. In contrast, we allow each individual faction member to have his/her own career path, and different faction groups to exhibit different degrees of cohesion. This generalization allows us to accommodate a whole spectrum of informal ties, from loosely connected social groups to highly cohesive factions.

Dewan and Squintani (2015) model endogenous faction formation. The authors develop a model

⁵Shih (2008, p.66) discusses issues of measurement with the premise that “*Despite the centrality of factions in Chinese politics, they are extremely difficult to observe in a systematic manner, especially in such an opaque political system.*”

⁶See also Belloni and Beller (1978). Persico et al. (2011) also point to the relevance of factional politics well beyond Mexico’s camarillas or the CCP, with references to studies of factionalism within the Japanese legislature (Cox et al., 1999, 2000) and the Italian parliament (Zuckerman, 1975; Kato and Merzhon, 2006; Ceron, 2015; and Laver and Giannetti 2004). Factions in Australian politics are discussed in McAllister (1991). The US urban party machine factional structure, such as in the case of Tammany Hall, are subject of an entire and even earlier literature. See Myers (1917).

where incentives for faction formation are ideological rather than economic (as in our setting and in Persico et al. 2011) and show how within their framework factions may serve welfare-enhancing purposes, limiting extremists within the party by tying them to moderate faction leaders. Factions are also shown to facilitate information sharing and party effectiveness in their model. In our model, political factions may wax and wane in power through time, driven by a confluence of factors including group cohesion, the pool of talent in a faction, and the presence of other powerful factions.

2 Institutional Background: the CCP

This section presents a brief institutional overview of the internal organization of the CCP in the reform era. It is in no way exhaustive, but only of assistance to the reader unfamiliar with Chinese politics in framing the analysis that follows.⁷

In 2019 the Chinese Communist Party, with its more than 90 million members, is one of the largest political parties worldwide and one of the most enduring (founded in 1921). The CCP organization is strongly hierarchical in nature and the party reflects one-to-one the organization of the Chinese state, as typical in the architecture of Leninist regimes.

The top of the CCP hierarchy is shared by the General Secretary of the CCP and the second ranked member of the CCP, who respectively assume the roles of President and Premier of the State Council of the PRC. Both leaders belong in turn to the Politburo Standing Committee (SC), formed by the other 5 members and which represents the set of the highest ranked politicians in China.⁸ The SC is an expression of the 25-member Politburo (PB), the executive body of the Central Committee of the Chinese Communist Party. The Central Committee (CC) is de jure the highest political body in the CCP and currently consists of 205 full members and a set of 171 Alternate Central Committee (AC) members in junior standing relative to the full members (and without voting rights). All members of the CC and AC are ranked hierarchically. The CC and AC are elected during National Congresses of the CCP and the interim plenary sessions fill retirements or deaths, granting promotions (and very occasionally administers demotions). Typically, CC members include ministerial-level officials and provincial ranking officials, including Provincial Party Secretaries (the highest CCP post in a Province) and Governors (the second ranked). It is important to notice that Provinces tend to display a political architecture that mimics the national government and the national party structure. Provincial leaders operate in the context of local party committees, and local party congresses are held typically every five years. The CCP maintains a pyramidal structure, branching all the way down to the village level and the Village Party Branch Secretary.

While not all layers of the Chinese political hierarchy present nodes mapping into a diarchic structure, most do, typically separating party roles and administrative roles. Examples of diarchic arrangements

⁷See also Chapter 1 in Nathan and Gilley (2003) for a less brief overview. For a comprehensive discussion of elite politics in China see references in Shih (2016).

⁸Historically, the size of the Standing Committee of the Politburo of the CCP has varied between 5 and 13 members.

include the presidency and premiership as the two highest ranking members of the Politburo Standing Committee; the PRC Presidency (President and Vice President); the State Council (Premier and Executive Vice Premier); and the top dyads at the provincial level (Provincial Party Secretary and Governor).⁹ We will occasionally refer to such pairs of positions as position 1 and 2.

The opportunity of entering the ranks of the CCP is closely guarded and party membership typically guarantees access and career opportunities beyond those available to common citizens.¹⁰ For this reason, an elaborate recruitment process typically operates through the selection of successful university students and through family and work connections. Evidence that social ties to powerful leaders matter for an individual's political career has been steadily accumulating in the literature. However, to what extent these ties glue a group of politicians into a cohesive political faction is less clear. Here we consider a few putative "factions" based on the existing literature and the accounts of political observers. A priori, we do not take a stance on which groups are true factions. Instead, we will let the data determine whether candidate groups behave in ways that would qualify as factions.

Membership of the Communist Youth League of China (CYLC), an ancillary organization to the CCP responsible for youth (members are typically between 4 and 28 years of age), has traditionally operated as an entry point in to the CCP. As discussed in Li (2012, 2013), individuals with a background in the CYLC are often referred to as members of the *Tuanpai* (i.e. Youth League [faction]) and tend to originate, although by no means exclusively, from less prosperous regions.¹¹ Li (2012) associates the CYLC with "populist" policies favoured by the rural poor and recent migrants to cities, as opposed to the policies preferred by more "elitist" groups comprised by CCP cadres close to former General Secretary Jiang Zemin, and a group of party officials connected to the Shanghai municipal administration. Indeed, the economic and political role of Shanghai cannot be emphasized enough in CCP internal interactions, to the point that the term *Shanghai Bang* (Gang) has often been employed to identify the patronage cluster close to Jiang and to the economic interests of the coastal provinces (Li, 2002). Some observers also point to the anomalous, and exceptionally rapid career trajectories of sons and daughters of prominent party officials and revolutionary veterans under Mao, often referred to as *Princelings*, as a faction. Finally, politicians with a military background also have a large presence on the Central Committee, at least historically, and will be explored as a possible *Military* faction. We will first examine the empirical regularities of factional politics based on these four prominent groups in recent history. Then, we will build a structural model where factions can emerge and wane stochastically over time.¹²

⁹See Li (2014) for a discussion and examples. Other instances include the CMC (chairman and executive vice chairman), the CCP Secretariat, the NPC and CPPCC (chairman and executive vice chairman), the Supreme People's Court. Assuming the presence of such dyads across the whole hierarchy should be simply read as allowing for the presence of a close substitute in the party hierarchy for any member.

¹⁰The Organization Department of the CCP Central Committee on June 30th, 2016 in an official release indicated that 22 million Chinese residents had applied in 2015 and less than 4.5 percent of the applications were accepted. http://news.xinhuanet.com/english/2016-06/30/c_135478976.htm

¹¹Prominent members include current Premier Li Keqiang and former General Secretary and President of the PRC Hu Jintao.

¹²The above four groups are by no means exhaustive. In principle, we could consider more groups defined by shared social background, such as Tsinghua Clique, Shaanxi Clique, and so on.

3 Data

Our first source is a biographical database of Central Committee members developed by Shih, Shan, and Liu (2008), and further updated by Lu and Ma (2015). This database contains all the Central Committee members from the first Party Congress in 1921 to the eighteenth Party Congress in 2012, covering a total of 1,968 politicians. We complement this data using China Vitae, an online biographical database that provides more than 5,000 biographies of Chinese political elites dating back to the 1950s. In terms of time span considered, Chinese politics probably experienced a structural transition from strongman rule to factional politics around the time of Mao’s death, and following the downfall of the Gang of Four in 1976. For example, Nathan (2016) observed that: “*Deng built a system of tacit norms by which senior leaders were limited to two terms in office, members of the Politburo Standing Committee divided leadership roles among themselves, and the senior leader made decisions in consultation with other leaders and retired elders.*” We thus focus our empirical analysis on the post-Mao era (11th to 18th Central Committees).

Following the literature on Chinese politics (Bo, 2008; Li, 2013a; Li, 2013b), we construct four affiliation indicators for the full sample of politicians: CYLC, Shanghai Gang, Military and Princeling status. A politician is classified as from the CYLC if he/she has held provincial and national level positions in CYLC. A politician is classified as from the Shanghai Gang if he/she has held official positions in the Shanghai municipal party apparatus, municipal government, municipal People’s Congress, and municipal People’s Political Consultative Conference. This again underlies the exceptionalism of the Shanghai political machine. A politician is classified as from the Military if he/she served as military personnel in the Revolutionary Era (1921-1949), or participated in the volunteer armies to Korea or Vietnam, or served as military personnel for more than half of their career after the founding of People’s Republic of China. The restriction of a minimum time of military experience is to rule out civilian officials who worked for a short period as party secretary of a military region (e.g. Hu Jintao as the First Secretary of Guizhou Military District from 1985 to 1988), or civilian officials who chaired the Central Military Commission (e.g. Jiang Zemin as the chairman of the Central Military Commission from 1990 to 2005). A politician is classified as a Princeling if he/she is from a prominent political family, the so-called “red aristocracy” (notable examples include General Secretary Xi Jinping and disgraced former Governor of Liaoning Bo Xilai). These affiliations are not mutually exclusive (for example, Xi Jinping is both a Princeling and affiliated with the Shanghai Gang, according to our definitions).

Table 1 provides the demographics and factional affiliations of our sample by level of Central Committees. Some factions appear to occupy a disproportionate share of seats at the highest levels of the party hierarchy. For instance, the fraction of politicians who have a CYLC background increases from 4 percent in the AC to 29 percent in the top-two leadership positions. Similarly, the fraction of politicians affiliated with Shanghai Gang increases from 3 percent in the AC to 25 percent in the top-two leadership positions. In contrast, politicians who have a Military background appear to distribute more uniformly across the party hierarchy. In terms of demographics, CC members are predominantly male, in their

mid-50s and mostly Han. Over the past 60 years, more members hold college or even post-graduate degrees. However, only 10 percent of them studied or worked abroad. More than 10 percent of them have worked as personal secretaries (*Mishu*) of prominent politicians, suggesting the importance of personal ties in Chinese politics.

4 CCP Factional Politics: Reduced Form Results

4.1 Faction-specific premia

A crucial feature of any analysis of factional politics is the ability of factions to deliver benefits to their members. This seems a necessary condition that any faction should satisfy, and that we should be able to verify in the CCP data in order to justify our approach.

We do this in what is possibly the starkest way: estimating premia in promotion rates of faction members. The regression model is the following:

$$\text{Promotion}_{i,t} = \sum_f \beta_f \text{Faction}_{i,f} + \gamma X_{i,t} + \epsilon_{i,t},$$

where $\text{Promotion}_{i,t}$ is a dummy variable which equals 1 if a politician i is promoted from Congress t to $t+1$, and 0 otherwise; $\text{Faction}_{i,f}$ is a dummy variable which equals 1 if i is affiliated with faction f , and 0 otherwise; $X_{i,t}$ is a set of control variables including demographics, time fixed effects, and hierarchy level fixed effects. The sample includes all members of the 11th to the 18th Central Committees (Politburo Standing Committee members are excluded from the promotion regression). Promotion equals 1 if a Central Committee member moves up in the rank defined by the four levels of Central Committee (1 SC, 2 PB, 3 CC, and 4 AC). β_f is defined as a “factional premium”.

Table 2 shows the regression results. As is clear from these reduced-form regressions, a CYLC (respectively, a Shanghai Gang) politician has a substantially higher likelihood of promotion. On average, CYLC and Shanghai Gang members exhibit promotion premia of 10 percent relative to unclassified politicians. In contrast, the more controversial groups, Princelings and Military, exhibit no clear premia in promotions. Columns 2 and 3 separate the samples into AC and CC. We find that factional premia are higher at higher levels of the hierarchy.

One may worry that factional premia may be generated by higher average ability of faction members, rather than by support from the faction. To address this selection concern, we consider the heterogeneity of factional premia over time by interacting a politician’s affiliation with the party general secretary’s factional affiliation and share of seats in the Politburo Standing Committee (SC). The regression model becomes the following:

$$\text{Promotion}_{i,t} = \sum_f (\beta_{0f} + \beta_{1f} \text{Leader Faction}_{t,f} + \beta_{2f} \text{SC Share}_{t,f}) \times \text{Faction}_{i,f} + \gamma X_{i,t} + \epsilon_{i,t} \quad (1)$$

where now $\text{Leader Faction}_{t,f}$ is a dummy variable which equals 1 if the supreme leader in Congress t is affiliated with faction f , and 0 otherwise; $\text{PBSC Share}_{t,f}$ is the share of Politburo Standing Committee seats occupied by faction f in Congress t ; $X_{i,t}$ is again a set of control variables for politician i including demographics, time fixed effects, and level fixed effects.

Table 3 presents the results. First, the table shows that having a cofactional leader adds 28.6 percentage points to the CYLC premium and 10.8 to the Shanghai Gang premium, thus inducing a substantial, highly significant, leadership premium to the rate at which members of a faction are promoted relative to periods when other factions are in power. Figure 1 provides a visualization of the leadership premia in promotion rates. These magnitudes are not trivial, yet quite far from winner-take-all levels.

Second, we find that having a 10 percentage points increase in the share of seats in the SC adds 5.2 percentage points to the CYLC premium and 6.3 percentage points to the Shanghai Gang premium. The estimates for Princelings and the Military are mixed, with insignificant or sometimes opposite signs. To a first approximation, the precise time-series co-variation of factional premia with leadership identity appears difficult to reconcile with an alternative view of faction members simply happening to have (on average) higher innate ability, and supports our supposition that the CYLC and Shanghai Gangs are plausible candidates for the study of factions.

4.2 Factional balancing

Useful to the understanding of factional dynamics within the CCP is the study of the peculiar factional balancing patterns which one observes by sampling the diarchic nodes pervading the Chinese institutional pyramid. These dyads are pairs of positions of similar rank and operating in close institutional proximity to each other.

Table 4 shows the raw frequency of the factional composition of virtually all top-two leadership posts from 1992 to 2015 including the Politburo Standing Committee (two highest-ranking members), PRC presidency (President and Vice President), the State Council (Premier and Executive Vice Premier), Central Military Committee (Chairman and Executive Vice Chairman), CCP Secretariat (two highest-ranking secretaries), NPC (Chairman and Executive Vice Chairman), CPPCC (Chairman and Executive Vice Chairman), the Supreme People’s Court (President and Executive Vice President), and 31 provincial and municipal units (Secretary and Governor).¹³

Each observation is a pair of positions in a node. We tabulate all the possible faction combinations in a 5×5 matrix, and the first panel reports the empirical frequency in the data. The columns and rows indicate the faction of the No.1 and No.2 politicians in each leadership node. For instance, the first element of Table 4 indicates that a CYLC-CYLC pair accounts for 2.20 percent of the positions in our sample. In the second panel, we produce the counterfactual frequency under random matching using the marginal distribution of each faction. Specifically, the first element indicates that a CYLC-

¹³Shanghai Municipality is excluded in the regression sample of Shanghai Gang.

CYLC pair should accounts for 4.12 percent of the observations if we were to match No.1 politicians and No.2 politicians randomly. The third panel presents the ratio between the empirical frequency and the counterfactual frequency under random assignment. We find a striking pattern: same-faction pairs appear to be much rarer in the data compared to the randomly assigned benchmark. In contrast, there is excess probability for cross-faction mixing pairs. A simple chi-square test sharply rejects a lack of association in the pairs (p-value < 0.01).

Table 5 reports additional statistical evidence. We ask: given the factional affiliation of a politician sitting in one of the top two leadership positions of a national or provincial organ, what is the likelihood that the other position will be held by a cofactional member? It turns out it is extremely low. The regression model that we estimate is the following:

$$\text{Faction1}_{k,t} = \alpha_f + \beta_f \text{Faction2}_{k,t} + \epsilon_{k,t} \quad (2)$$

where the dependent variable $\text{Faction1}_{k,t}$ (and respectively, $\text{Faction2}_{k,t}$) is a dummy variable which equals 1 if the No.1 official (respectively, No.2) of node k from that faction and 0 otherwise. β_f/α_f is defined as the “same-faction discount”.

We conduct the same regression for each faction or group separately. We find that a CYLC member at No.2 predicts a significantly lower probability of a CYLC member at No.1. The magnitude is also significant. The presence of a CYLC at No.2 reduces the probability of a CYLC at No.1 by 10-20 percent. We find similarly significant results for the Shanghai Gang and of comparable magnitudes. Interestingly, the evidence for Princlings and the Military is much weaker, in line with further evidence below showing their lack of behavior as organized factions within the Party and no “same-faction discount”. To the best of our knowledge, these facts on systematic cross-matching within Chinese elite politics are new.

An ancillary implication of this evidence is that methodologies imputing factional affiliation based solely on shared professional paths may be problematic, as discussed in the Introduction. Most individuals sharing a leadership node do not belong to the same faction, and are systematically more likely to belong to different ones.¹⁴

5 Model

5.1 The hierarchy of positions

There is an L -level hierarchy of leadership positions, ordered from the bottom, 1, to the highest level L . Each level, ℓ , of the hierarchy has an $M_\ell/2$ leadership nodes. Each leadership node has a pair of leadership positions. The hierarchy is broken up into regions, each of which nests a higher number of smaller regions below it. Level L , the top level, has one node and hence two positions; $M_L = 2$. It is the paramount leadership node for the country as a whole (currently, President Xi Jinping and Premier

¹⁴In Internet Appendix Table 1, we also show that a remarkable factional balance seems to be present in the punishment administered under President Xi Jinping’s anti-corruption campaign.

Li Keqiang). Level $L - 1$, the second layer in the hierarchy, has $M_{L-1} > M_L$ positions divided up into $M_{L-1}/2$ nodes, and so on, with the number of positions strictly increasing down to level 1. The nodes at the lowest level are “entry” positions, corresponding to the first step in a political life that we model.

5.2 Social groups and political factions

Individuals are born into the entry level of the political hierarchy, $\ell = 1$. Each individual, i , is endowed with ability, a_i , drawn from a distribution Ψ , and membership of a social group, drawn from a distribution Φ , and indexed by f . An informal social contract enforces a quid-pro-quo relationship among members of a social group. To represent this, we assume that an individual cares about their own group members’ welfare when making decisions. The “strength” of a social contract is represented by a single parameter capturing the intensity of this concern. Let $\theta_f \in [0, 1]$ denote how much a member of group f cares about other group members’ utilities, so that a higher θ implies a more cohesive group. If $\theta = 0$, f is equivalent to a loose social group, whose members share the same social background, but do not weigh each other’s interest. If $\theta = 1$, f is a perfectly cohesive group, whose members act in full cooperation with other members.

Define $\Theta_{F \times F}$ as a diagonal matrix where f ’s element in the diagonal is the cohesion of group f , and F is the total number of social groups. Define $D_{N \times F}$ as the affiliation matrix of politicians where $d_{i,f} = 1$ if individual i belongs to social group, f , and 0 otherwise. Then we can derive the cohesion matrix $C_{N \times N} = D\Theta D' A^{-1}$, where A is a diagonal matrix whose diagonal elements are the same as $D\Theta D'$.¹⁵ $c_{i,j}$ of the cohesion matrix $C_{N \times N}$ measures how much individual i and j care about each other through their affiliation to various social groups. If social groups are mutually exclusive, then $c_{i,j} = \theta_f$ if individuals i and j belong to the same social group f , and $c_{i,j} = 0$ if individuals i and j belong to different social groups. It is possible to micro-found the endogenous emergence of social cohesion between group members based on their investing in connections in order to benefit from future support in their political career. Since there are many possible ways of endogenizing group level connections deriving from the fundamental parameter θ_f , and no way of discriminate between them with our data, we relegate our discussion and development of a particular microfoundation for this relationship to Internet Appendix I, and proceed with the assumed direct relationship between $c_{i,j}$ and θ_f in the body of the paper.

Political factions are clusters of individuals at high levels of the party hierarchy who belong to the same cohesive social group. A cluster of politicians who belong to a loosely connected social group ($\theta = 0$) is not a faction because they do not behave in a cohesive manner. Cohesive social groups that are not present at high enough levels of the party hierarchy will also not effectively be political factions because they lack political power.

¹⁵We scale each row of $D\Theta D'$ by the corresponding diagonal element, so that each politician’s cohesion to himself or herself is normalized to 1. The concept of cohesion here is somewhat distinct from that of power of a faction, which is determined by the positions of the member of the faction acquire. Further, cohesion does not cover the ability of the faction to punish members of the faction or of the Party at large.

5.3 The state of the system

Each position of the hierarchy is occupied by a politician i , who is characterized by innate ability, a_i , an affiliation vector, $d_i = \{d_{i,f}\}_{f=1}^F$, and the tenure at the current position, τ_i . There are a total of $N \equiv \sum_{\ell=1}^L M_\ell$ positions in the political hierarchy. The state of the system is the value taken at each position in the hierarchy for each of these variables. Denote the state of the system by \mathcal{X} ; an $N \times 3$ dimensional object. The state of the system is known to each politician.

Time is discrete, indexed by the Party Congress, t . The political hierarchy evolves when incumbent politicians retire and are replaced by ones promoted from below. In reality, many retirements are occasioned by a type of term limit within the CCP. If a politician is not promoted to the next level within two National Congresses (i.e. ten years), the politician is forced to retire. In the data, 94.5 percent of the Central Committee members stay at the same level for no more than two Congresses.¹⁶

We now describe the evolution of the state variable between two Party Congresses. At the start of Congress t , a set of politicians, $\mathcal{R} = \{i : \tau_i = 2\}$, are facing term limits and must retire. Each retirement triggers a chain of promotions down the hierarchy. We assume retirements occur sequentially following order of seniority. We index the state of the system at each step of a promotion chain by $\mathcal{X}_{t,r,\ell}$, where the subscript t represents the Party Congress t , the subscript r represents the current retirement, and the subscript ℓ indicates the level of the current opening. Suppose the r 'th retirement occurs at a node at level $\ell > 1$ paired with a co-node politician $-i$. The set of candidates for the opening, \mathcal{A} , comprises all politicians at level $\ell - 1$. We describe the promotion contest in more details later. For now, we assume a winning candidate fills the opening, vacating his or her own position in turn, and the state transitions to $\mathcal{X}_{t,r,\ell-1}$ with an opening at level $\ell - 1$. This process repeats and the opening at $\ell - 1$ is filled, leaving an opening at $\ell - 2$. A similar cascade of openings continues $\ell - 1$ times, until an opening at level 1 is reached with some corresponding state $\mathcal{X}_{t,r,1}$. At that point a new politician, k is born with an ability a_k and affiliation vector d_k drawn from Ψ and Φ respectively, determining state $\mathcal{X}_{t,r,0}$. After the r 'th promotion chain ends, the $r + 1$ 'th retirement occurs, which triggers a new promotion chain. We assume that a politician can only be promoted once during each National Congress (i.e. every five years), which is consistent with the fact that most of the promotions involve a one-step change in the level.¹⁷ The retirement and promotion processes end when all of the politicians facing term limits, \mathcal{R} , are retired or promoted. This also marks the end of the t 'th Party Congress. The $t + 1$ 'th Congress will inherit the final state of the previous Party Congress with the tenure τ_i increased by 1.

5.4 Economic performance

We now describe the promotion contest. An important feature of the promotion contest is the expected economic performance of the jurisdiction if a politician is promoted to the position. In a system that is fully transparent, without corruption or rent-seeking, and where political leaders only benefit through

¹⁶See Internet Appendix Table 2.

¹⁷See Internet Appendix Table 2.

promotion related to job performance, there would be no possibility of extra private benefit to the politician from their performance. But this does not accurately describe politician incentives in China. Accordingly, assume that while politicians are in office, they supply public goods or services, from which they are able to extract personal benefits (Shleifer and Vishny, 1993) in the form of rents transferred to them from the economic agents that their services or goods benefit. Specifically, assume the local government, represented by the two leaders, i and $-i$, at the node, are joint monopolists of public good provision. Define $v^\ell(q_i, q_{-i})$ as the private benefit that leader i at level ℓ can extract when q_i and q_{-i} respectively are the total public goods produced by politicians i and $-i$. Notice that the private benefit v^ℓ is a function of the level of the position, ℓ , such that positions at higher levels are assumed to generate greater private benefits. We assume the function v^ℓ is continuous, twice differentiable in its arguments, strictly concave, and that $v_1^\ell(0, \cdot) > 0$. As they are joint monopolists in the provision of local public goods, the private benefit to i is declining in the supply of public goods by $-i$:

$$v_2^\ell(q_i, q_{-i}) < 0. \quad (3)$$

The provision of local public goods depends on the factional composition of the local government. Local politicians who do not belong to the same faction act as Cournot competitors. In contrast, since cofactional members care about each other's utility to a degree $c_{i,-i}$, local politicians who belong to the same faction will take partial account of the decline in a cofactional's marginal benefit when they raise their own provision of public good. That is, once in office, i will maximize:

$$\max_{q_i} v^\ell(q_i, q_{-i}) + c_{i,-i} v^\ell(q_{-i}, q_i). \quad (4)$$

It is shown in Internet Appendix II, that this problem yields a unique solution. It is straightforward to observe that their mutual concern allows cofactional politicians to collude in raising their own respective welfare by reducing public good provision, and hence local economic performance.¹⁸ The greater their concern for cofactionals, the closer they come to acting as a joint monopolist at their node. A monopoly is achieved at $c_{i,-i} = 1$.

Local economic performance, e , is assumed to be increasing in the public goods provided, increasing in the politicians' innate abilities, a_i, a_{-i} (drawn at birth, and common knowledge), and increasing in the level of the position, ℓ . It is given by the function $e^\ell(q_i, q_{-i}, a_i, a_{-i})$ which is increasing in all arguments. This can be denoted more compactly by $e_{i,-i}^\ell$. We assume that e is continuous and differentiable in all variables, which are themselves continuous. The absence of factional ties at a node in the hierarchy translates into a lower ability to collude to rent seek by the two politicians. Conversely, through this mechanism, higher factional cohesion implies more ability to collude, damaging economic performance

¹⁸The analysis does not exclude the presence of welfare enhancing policies stemming from unified leadership at each node, which could foster local coordination and more expeditious implementation. It is, however, essential that on net the negative consequences of local political collusion can be stronger than the positive ones. The perils of elite collusion in China are described in Ruan and Wang (2022) in the context of village governments. Pei (2017) using detailed case studies describes the threats to regime stability due to corruption and elite collusion in post 1990 China.

for the private benefit of the two local cadres.

5.5 Promotions and support decisions

Openings are created in the hierarchy by retirements and promotions. As described in subsection 5.3, when an opening arises at level ℓ , the set of eligible candidates, \mathcal{A} , is drawn from level $\ell - 1$. All politicians in the hierarchy, observe the opening and the state, \mathcal{X} , and decide how much support to lend to each of the candidates contesting the position. Following much of the discussion on CCP internal organization we allow that decisions of politicians over whom to support for promotion can be driven by both factional interests and local economic performance.¹⁹

In terms of factional interests, politicians internalize the utility gain arising to a cofactional when he/she receives a promotion. Assume that ascending one step up the promotion ladder gives rise to a utility gain of $b^\ell > 0$. Hence, if a cofactional is promoted, a politician from faction f would receive an additional benefit of $b^\ell \theta_f$.

Notice that the utility gain b^ℓ is a function of the level of the position ℓ and promotions to higher levels generate larger utility gains; $\frac{\Delta b^\ell}{\Delta \ell} > 0$. Party members also care about local economic performance of the specific locality where a candidate i would be promoted when paired with politician $-i$; $e_{i,-i}^\ell$ defined above.

Denote the level of support by politician j to candidate i , for a position with co-node politician $-i$, as $s_{i,-i,j}$. To simplify notation, we suppress the $-i$ subscript, and express this more compactly as simply support for i from j , $s_{i,j}$, when unambiguous to do so. Assume support is non-negative valued, and the cost to j of giving support is given by $k(s_{i,j})$, with $k(0) = 0$. Assume k is strictly increasing, convex and arbitrarily small to increment from zero; $k'(0) \rightarrow 0$. Support of i can potentially yield numerous benefits for j . First, support makes i 's promotion more likely, benefiting j to the extent he internalizes i 's utility gain from promotion, b^ℓ , and the economic benefits, $e_{i,-i}^\ell$. Supporting a candidate may also generate reciprocal favors to j , in personal or career dimensions, that can provide another source of benefit for j . We employ a general, but static, specification of the benefits of support that allows for these factors to potentially be integrated in the model.²⁰ Denote this benefit by $\pi(s_{i,j}, e_{i,-i}^\ell, b^\ell c_{i,j})$, which is

¹⁹There is some debate in the literature over the importance of local performance, its interaction with connections, and the relative importance of positions in the dyad. Li and Zhou (2005) find that, for provincial leaders, promotion largely depends on their ability to boost economic growth. In a review of the early literature, Brandt et al. (2014) confirm a tournament-like competition among county and provincial leaders focused on growing local economies. Shih et al. (2012) in contrast contend that political connections far outweighed economic performance in importance. Such findings are somewhat squared by Jia et al. (2015), who find that meritocracy exists only among connected leaders. Lorentzen and Lu (2018) emphasize the importance of hierarchy level in affecting the tournament. They interpret the evidence as mixed on the effect of merit (i.e. local GDP growth) for officials at or above the provincial level, but supportive of meritocracy at lower levels. Consistent with this, Landry et al. (2018) report a positive correlation at county levels, but not at the prefecture. Within leadership dyads, Chen and Kung (2019) find strong effects of GDP growth for promotion of governors, but not for party secretaries. Sheng (2020) finds evidence for meritocratic promotion of provincial governors only during Jiang Zemin's era (1990-2002).

²⁰Though a dynamic, future oriented, anticipation of support's benefits certainly captures additional realistic features, that requires agents to predict the evolution of the state to compute the realization of these benefits, which makes that approach intractable here.

increasing and concave in the level of support, $\pi_1 > 0$, $\pi_{11} \leq 0$, and has positive cross partial derivatives, $\pi_{12}, \pi_{13} > 0$; i.e., the marginal benefit of support is increasing in both the economic importance of the position and the private utility gain created by the position. We again assume differentiability and continuity of this function. In computing optimal support, politician j solves:

$$\max_{s_{i,j}} \pi(s_{i,j}, e_{i,-i}^\ell, b^\ell c_{i,j}) - k(s_{i,j}). \quad (5)$$

We have that:

Proposition: *There exists a unique solution to (5), denoted $s_{i,j}^*$, corresponding to the optimal level of support given by each politician j to each candidate i contesting any open position in the hierarchy. For an opening at level ℓ paired at a node with politician $-i$, $s_{i,j}^*$ is: (a) increasing in the cohesion between j and i , $\frac{\partial s_{i,j}^*}{\partial c_{i,j}} > 0$; (b) decreasing in the cohesion between i and $-i$, $\frac{\partial s_{i,j}^*}{\partial c_{i,-i}} < 0$; (c) increasing in the utility gain from promotion, $\frac{\partial s_{i,j}^*}{\partial b^\ell} > 0$, if and only if between cofactionals, $c_{i,j} > 0$; (d) higher for cofactionals vis- \tilde{A} -vis neutrals, the higher the position in the hierarchy, $\frac{\partial \left(\frac{\Delta s_{i,j}^*}{\Delta \ell} \right)}{\partial c_{i,j}} > 0$. (e) Higher ability, a_i , candidates are more heavily supported by all politicians; $\frac{\partial s_{i,j}^*}{\partial a_i} > 0$.*

Proof: see Internet Appendix II.

Members lend greater support to a cofactional candidate than candidates from other factions because they directly gain from their cofactional's promotion; part (a). So, a candidate with more cofactionals (and especially at higher levels) will, *ceteris paribus*, receive more overall support in promotions due to this direct effect. This increase is more pronounced the larger the utility increment arising from promotion; part (c).

In addition, the intensity of factional support depends on the co-leader politician at the opening, because of the indirect effect on economic performance e . If the other position is controlled by a rival faction to i 's group, or a neutral, ($c_{i,-i} = 0$), politician j will support i more strongly than in the case where the other position is controlled by the same faction as i 's ($c_{i,-i} > 0$); part (b).

This result implies that, if a faction already controls a position at a leadership node, then candidates from this faction will face additional opposition in contesting the other position, because politicians across the board will be wary of the detrimental effect that colluding local politicians will have on economic performance. This emerges from the need to mitigate the local monopoly power and a shared interest in keeping public good provision at high levels across all factions.²¹

A relevant implication of this result is that a more cohesive faction (i.e. with higher θ and hence higher $c_{i,-i}$) will face stronger opposition from rivals when it wants to take complete control of a leadership pair. This derives from rival factions knowing that members from a more cohesive faction

²¹Factions within our model generate two forms of inefficiency. The first arises from the joint monopolistic behavior of cofactional members if they are ever to be paired at the same node. The second is that, due to the direct utility benefit that cofactionals get from seeing one of their own promoted, ability is not the only factor that decides who will fill vacant positions. Factions, however, check on rivals by reducing the likelihood of promotion of members of other faction when they have the opportunity to be appointed next to a cofactional, hence helping in limiting at least one of these sources of inefficiency when they would arise from rivals.

will collude more, will restrict public goods more, and will lower economic performance more. It follows that although a cohesive faction can help their own candidates get promoted, through a larger direct benefit of having a member moving to a higher node, it is actually more difficult for such a faction to take complete control of any leadership node because other factions will support alternative candidates more strongly. In contrast, a completely incohesive faction (with $\theta = 0$) will not be resisted by any rival faction, because whoever this candidate's cofactional is, no collusion arises, and only the candidate's ability will determine his/her promotion.

An endogenous force favoring factional balancing thus emerges here. Though there is no coordination in support decisions within factions, or across factions as a whole, all members' decentralized optimal support decisions yield an implicit system of checks and balances. It is difficult for a single faction to obtain complete control of the party hierarchy because individual politician support decisions favor factional balancing at the various nodes in the hierarchy, preventing a single one from gaining control. In Chinese elite politics, Li (2002) and Dittmer (1995) discuss supporting anecdotal evidence for the presence of factional balancing forces. The model provides a decentralized account of how these forces may emerge from individual politician incentives.²²

Faction members will receive increased support for promotions relative to neutrals, the higher they ascend up the hierarchy; part (d). All politicians have more to gain from lending support to promotions at higher levels because economic consequences are greater. But cofaction members additionally gain because they partially internalize the greater utility gains of promotion of cofactionals higher up the hierarchy. Accordingly, stronger support will be provided to a faction member (relative to a neutral) the higher the position in the hierarchy. Finally, higher ability individuals generate more economic benefits as they move up the hierarchy, and thus receive, *ceteris paribus*, more support irrespective of faction; part (e).

5.6 From support to promotion

The promotion probability for each candidate i contesting an opening depends on the support received for this candidate by other politicians in the hierarchy, and the support that all other candidates for the same opening receive from politicians as well. We allow both top-down support from senior members and bottom-up support from junior members to affect promotion. This reflects the formal promotion procedure of the CCP.²³ We permit the per-unit effect of support from a more senior party member to be higher than that of a more junior member. To that end, we introduce a multiplicative weighting, w_j , on the effect that each supporter j 's chosen support for candidate i has when computing the impact of

²²Balancing is also present in other nondemocratic systems, for example, among ethnic groups in African governments (Francois et al., 2015), between reformers and conservatives in Iran (Mehdi, 2002), and in North Korea (Newson and Trebbi, 2018). Balancing may also be driven by aggregate level coordination between the groups, and we think it is likely in these contexts. We discuss in section 5.8 reasons to favour our individual driven foundation in the CCP context.

²³See Internet Appendix III for an overview of the formal promotion procedure of CCP.

that support on promotion. That is, the total support to candidate i is given by:

$$S_i \equiv \sum_j w_j s_{i,j}^*, \quad (6)$$

where $s_{i,j}^*$ is defined in the proposition above as the solution to (5), and where w_j is permitted to vary with the level, ℓ , of supporter j . We normalize weights to satisfy $\sum_j w_j = 1$. Note that a particular concept of “power” (i.e. the power to affect someone’s career) is captured in our formulation by the w_j ’s. When we obtain estimates of w_j we will be able to quantify this concept of power, and to compare it across positions in the CCP hierarchy by seeing how it varies with the level ℓ of supporter j .²⁴

Given an opening, a set of eligible candidates, \mathcal{A} , levels of support, $s_{i,j}^*$ (and corresponding S_i), the probability of a candidate i winning a promotion, p^i , is given by a function with $I \equiv |\mathcal{A}|$ arguments as follows:

$$p^i = p^i(S_1, S_2, \dots, S_i, \dots, S_I). \quad (7)$$

We impose standard contest function features (Tullock, 1980) on equation (7). That is, the probability of candidate i winning a promotion is increasing in the level of total support i receives, $\frac{\partial p^i}{\partial S_i} \geq 0$. It is decreasing in the support received by other candidates $\frac{\partial p^i}{\partial S_h} \leq 0, \forall h \neq i$. And p^i is homogeneous of degree zero, so promotion probabilities do not change if support to all the candidates increase proportionally.

5.7 Evolution of the system

The political hierarchy evolves as a stochastic Markov chain. Party Congress t starts with a state $\mathcal{X}_{t,0,0}$ inherited from the previous Congress. At the start of the Congress, a set of politicians, \mathcal{R} , are facing term limits. Retirement occurs sequentially. Each retirement r sets off a promotion chain, which changes the state variable from $\mathcal{X}_{t,r,\ell}$ to $\mathcal{X}_{t,r,0}$. After all the potential retirement cases are considered, Congress t ends.

Within each step of the promotion chain, the optimal level of support solving (5) received by each $i \in \mathcal{A}$, given by a politician j , is $s_{i,j}^*$. The proposition demonstrates that $s_{i,j}^*$ is unique and depends on $c_{i,j}$, $c_{i,-i}$, a_i and ℓ . Given the state $\mathcal{X}_{t,r,\ell}$, $s_{i,j}^*$ is thus determined for all j politicians in the hierarchy. Consequently, aggregate support, $S_1, S_2, \dots, S_i, \dots, S_I$ for all $I \equiv |\mathcal{A}|$ follows from equation (6). The arguments of the function in (7) are thus fully determined, and the stochastic outcome of that function selects the winning candidate. The winning candidate fills the opening, vacating his or her own position in turn, and the state transitions to $\mathcal{X}_{t,r,\ell-1}$. The process repeats until a new politician is drawn, which ends the r ’th promotion chain.

Although social groups exist exogenously in the population, powerful political factions emerge and

²⁴In the estimation part of the paper, the logistic contest function that we will use for the promotion function of support will be extremely convenient for quantifying this notion of power, as it has the property that support simply scales by the weight of the supporter. That is, for candidate i , a marginal increase in support from politician j , $s_{i,j}$, has effect: $\frac{\partial p^i}{\partial s_{i,j}} = w_j \frac{\partial p^i}{\partial S_i}$. This monotonic effect of supporter power would generally hold, but not necessarily scale directly if using other contest functions.

evolve endogenously at the higher echelons of the party hierarchy due to talented individuals and cohesive social ties. For instance, if a high ability politician is born into a cohesive social group, then this politician can move up the ladder quickly because of the combination of ability and support by the social group. Once occupying high office, this politician can in turn help other members of the group to ascend. With enough politicians occupying important offices, a powerful political faction then emerges.

But a faction need not last forever. If powerful faction members retire without being replaced by new members of the same caliber, the faction will gradually lose power. The speed at which faction power will tend to fluctuate depends on the distribution of support weights along the party hierarchy. If the support weight is evenly distributed among politicians in the hierarchy, then the stochastic factors involved with any particular promotion are largely averaged out. In contrast, if all the decision power is concentrated in the supreme leader, then fluctuations of faction power become more volatile as the contest for the supreme leader heavily affects all other contests.

It is worth emphasizing that the model treats the cohesion of social groups as constant over time. In principle, introducing time-varying cohesion factors would introduce another source of fluctuation in faction power that would act in addition to those introduced by the stochastic promotion process.

5.8 Alternative models

This subsection addresses alternative modeling choices to the one we propose in Sections 5.2 to 5.7. As our baseline model focuses on CCP members' individual incentives and their support decisions, rather than on a grand bargaining among large unitarian groups, it is of particular importance to discuss a competing class of theories focused on modeling power sharing/bargaining across collective actors. These models are common in Political Economy. Examples in the literature include Padro-i-Miquel (2007), Persico et. al. (2011), Francois et. al. (2015). These papers focus on parties, ethnic groups, or factions (or representative agents thereof) as the main players within non-cooperative settings in non-democracies. While our model does include these aggregate groups as part of its structure, it instead focuses on the individual members as the main actors by analyzing party cadres' incentives and support decisions of promotion within the CCP hierarchy. The main takeaway of this subsection is that, while the collective faction bargaining approach is a priori sensible, probably the correct approach in many settings, and may even match some of the stylized facts in section 4 (notably, the existence of faction premia), there are distinct observable implications that lead us to favor the micro-focused model.

As an intuitive benchmark, let us consider a collective bargaining model in which each faction has a top leader, and these top leaders bargain among themselves on how to split the value of the State, as represented by the positions in the political hierarchy, keeping an eye on both each group's allocation and the total size of the pie.

First, while the collective faction bargaining approach can easily generate power sharing in the aggregate, it does not obviously yield a local balance of power at each node of the hierarchy, as per section 4.2. In fact, some versions of faction-level bargaining would tend towards each faction carving out their own spheres of influence and stable faction strongholds within the State. High-level bargaining

would seem less likely to result in overlapping and ever-shifting territories of influence for the groups, as seen in section 4. Local mixing can create friction and opportunity for conflict among factions without obvious benefits at aggregate (factional) levels – that is, unless some hidden actions can be taken at the local level outside the control of the top faction leaders. To this point, our individual-based model featuring moral hazard of local politicians at each node provides such a rationale.

Second, a collective faction bargaining approach would have implications that are not borne out in the data. It is a somewhat general and intuitive result that in a stationary environment, power sharing equilibria require a certain level of rebalancing, so that idiosyncratic shifts in power of a faction (a minister dying or retiring due to a scandal) subsequently get corrected to avoid drastic swings in the fortunes of groups, including opening the flank to possible purges, arrests, or exclusion from any form of participation in influential positions. Were a grand power sharing bargain at play within the CCP, one would expect some form of rebalancing where, if a faction happened to become, for idiosyncratic reasons, excessively strong yesterday, a competing faction should become relatively stronger today in order to restore the balance of power. Ethnic groups' shares in the allocation of cabinet posts in Africa during the period 1960-2004, for example, appear stationary and exhibit exceptional stability (Francois, Rainer, Trebbi, 2015).

For the case of China, in Table 6 we checked whether, in the aggregate, the power scores of each faction evolve over time as a positive function of the lags of the power scores of all other factions. There is no evidence of such rebalancing behavior. Using Bo's (2010) methodology to measure power based on the value of positions allocated to a group, the power score levels of each faction are solely correlated with the faction's past power score levels, and there is no statistical evidence of systematic rebalancing across factions. That is, it is not the case that a more powerful CYLC faction yesterday prompts a subsequent correction in the strength of the Shanghai Gang today, or vice versa. Instead of positive and significant coefficients of lagged power shares of competing factions on a faction's power today, we often obtain negative and imprecise estimates.

In addition, it is worth mentioning that in the aggregate time series regressions of Table 6, Princelings and the Military groups behave exactly like the CYLC and the Shanghai Gang factions. Hence, it would seem that maintaining an aggregate approach would also have limited statistical power in discriminating whether Princelings and the Military are a faction or not. We show in section 7 that our micro-founded structural model has such power, and we are able to reject that the Princelings and the Military groups behave like organized factions.

Third, we can also explore the “micro” analog of the collective faction bargaining sharing story, namely whether the individual CCP member likelihood of promotion is affected not just by the strength of his/her faction at that time, but also by the relative imbalance of his/her faction's power relative to the historical level of that faction (measured by a moving average of the previous decade's factional power scores). Power sharing agreements would, in fact, generally require individual promotion rates to be higher for members of factions idiosyncratically falling short of “what is owed to them” in terms of party appointments. For this “micro” rebalancing analysis, we follow the saturated specifications of

Table 3, where we study the conditional promotions of CCP members, augmenting the regression with the difference between the historical 10 year moving average of the power score of the faction to which an individual belongs and that faction’s current level of power. This imbalance measure is a variable that should increase the likelihood of promotion of a factional member, as it is strictly increasing in the need for rebalancing to higher levels of power in favor of his/her specific faction (i.e. the variable is positive if the faction is under its historical levels and negative if it is above).

Table 7 reports the evidence on factional rebalancing effects at the micro level. The imbalance variables (also presented for a 5 year moving average version instead of a 10 year moving average) do not play a role for promotion of any faction member (CYLC, Shanghai) or for any group member (Princelings, Military) in our regressions. All coefficients are statistically insignificant. Signs of the coefficients on the imbalance variables are also inconsistent across factions and fluctuate across specifications, depending on the type of fixed effects used in the regression. Finally, adding faction imbalance measures delivers virtually no gain in terms of in-sample fit of the reduced-form model of individual promotions.

As a fourth point, a collective faction bargaining approach seems less faithful to the institutional reality of Chinese politics. Individual members’ actions within the Communist Party matter substantially and to a degree not typical elsewhere. This is even reflected within the formal procedures of the CCP. The promotion of an official requires, in addition to the blessings of immediate superiors (“one-level-up” policy, see Kung and Chen (2019)), no explicit opposition from subordinate cadres. In studying Chinese elite politics, intuition transposed from Western political contexts (based on formally organized political parties and their interactions at national level) or other non-Western contexts (where politics is organized around ethnicity or tribe and where group elites play outsized roles²⁵) may not be a reliable guide. Regarding the CCP, it has been known at least since the analysis in Nathan (1973) and Dittmer (1995), that informal patron-client ties linking chains of individuals throughout the CCP organizational hierarchy are present and relevant, suggesting they should be present in a model of the CCP. In contrast, promotion decisions as emanating from agreements between top faction leaders has little support in the informal literature on elite Chinese politics.

In this subsection, we have discussed the empirical basis for why a micro-founded, career progression model to represent the CCP was chosen. By doing so, we do not mean to suggest that it may not be possible to formulate a grand bargaining model that would perhaps succeed in matching some, or even all, of the empirical moments that we have discussed above. Alternatively, there may exist some other type of model, not yet imagined in the literature, that could perform even better. Quantitative formalizations of such alternative approaches applied to the CCP should be welcomed, but must be subjected to rigorous empirical scrutiny. In the next section, we turn to doing precisely this for the model that we have developed.

²⁵See, for example, Acemoglu, Reed, Robinson (2014) in Sierra Leone.

6 Estimation

6.1 Parameterization

The dynamics of the model are determined by the support that each politician receives. We assume the total private benefit to politician i at the node is given by $v^\ell(q_i, q_{-i}) = (\nu_0 + \nu_1\ell - q_i - q_{-i})q_i$, where $(\nu_0 + \nu_1\ell - q_i - q_{-i})$ is the per unit private benefit of supplying public goods. Note that endogenous variables (q, e, s) are all t -varying, but we omit subscripts for simplicity. The per unit private benefit of supplying public goods is declining in the total quantity supplied, reflecting a standard downward sloping demand function. Similarly, $v^\ell(q_{-i}, q_i) = (\nu_0 + \nu_1\ell - q_i - q_{-i})q_{-i}$ is the total private benefit to politician $-i$.

The maximization problem (4) is thus:

$$\max_{q_i} (\nu_0 + \nu_1\ell - q_i - q_{-i})q_i + c_{i,-i} ((\nu_0 + \nu_1\ell - q_i - q_{-i})q_{-i}).$$

This yields optimal solutions for i and $-i$:

$$q_i = q_{-i} = \frac{\nu_0 + \nu_1\ell}{c_{i,-i} + 3}.$$

We assume the benefit of providing support simply scales the sum of economic performance and extra utility gain, $\pi(s_{i,j}, e_{i,-i}^\ell, b^\ell c_{i,j}) = (e_{i,-i}^\ell + b^\ell c_{i,j}) s_{i,j}$. The support cost function is quadratic: for politician j to support candidate i costs $k(s_{i,j}) = \frac{1}{2}s_{i,j}^2$.

Solving equation (5) using these functional forms, yields the optimal support given by politician j to candidate i as:

$$s_{i,j} = e_{i,-i}^\ell + b^\ell c_{i,j}. \quad (8)$$

Local economic performance is assumed to be a linear additive function of the total amount of public goods provided and the politicians' innate abilities, $e_{i,-i}^\ell \equiv q_i + q_{-i} + \alpha(a_i + a_{-i})$. The linear additive relationship could be seen as arising as the log of a Cobb-Douglas production function. We assume promotion utility gains to be linear functions of the level of the position, $b^\ell = \delta_0 + \delta_1\ell$.

We assume a standard contest function form for the promotion probability, given by a logistic function:

$$p^i \left(\sum_j w_j s_{1,j}, \sum_j w_j s_{2,j}, \dots, \sum_j w_j s_{i,j}, \dots, \sum_j w_j s_{I,j} \right) = \frac{\exp \left(\sum_j w_j s_{i,j} \right)}{\sum_{h \in \mathcal{A}} \exp \left(\sum_j w_j s_{h,j} \right)}. \quad (9)$$

We finally assume that support from the supreme leader and the Politburo Standing Committee members enter with additive (and potentially differing) weights in promotion contests, $w_j = \omega_0 + \omega_1 1_{j,[SC]} + \omega_2 1_{j,[Leader]}$.²⁶ Note that the intercept of the support weights, ω_0 , is determined by the

²⁶In principle, we could allow support weights to be any arbitrary function of the levels and positions. However, we do

equation $\omega_0 N_0 + \omega_1 N_1 + \omega_2 = 1$, where N_0 is the total number of politicians in the Central Committee and N_1 is the number of politicians in the Politburo Standing Committee excluding the supreme leader.

Given the parameterization above, we can derive the following expression of total support received by politician i contesting a position next to $-i$:

$$\sum_j w_j s_{i,j} = \sum_j (\omega_0 + \omega_1 1_{j,[\text{SC}]} + \omega_2 1_{j,[\text{Leader}]}) c_{i,j} (\delta_0 + \delta_1 \ell) + \frac{2(\nu_0 + \nu_1 \ell)}{c_{i,-i} + 3} + \alpha (a_i + a_{-i}). \quad (10)$$

To operationalize the model, we draw ability a_i from a standard normal distribution (defining the empirical distribution of Ψ). We normalize the weight on ability, α , to 1 because $\nu_0, \nu_1, \delta_0, \delta_1$ can be arbitrarily rescaled by α and the promotion probability function is homogeneous of degree zero. In our baseline estimation, we use four groups: CYLC, Shanghai, Princlings, and Military.²⁷ We normalize the faction cohesion of unclassified politicians to 0. The entry probabilities of these groups (defining the empirical distribution Φ) are calibrated to match the average share of these groups in the entire CCP hierarchy across all levels in our sample period, which are: CYLC, 4.5 percent; Shanghai, 3.5 percent; Princlings, 3.5 percent; Military, 23.9 percent.

6.2 Estimator

There are ten parameters to be estimated. They include four faction cohesion parameters ($\theta_1, \theta_2, \theta_3, \theta_4$, for CYLC, Shanghai, Princlings, Military respectively), two support weight parameters (ω_1, ω_2), two private benefit parameters (ν_0, ν_1) for v^ℓ , and two utility gain parameters, (δ_0, δ_1) for b^ℓ . The model can simulate the entire history of the state variable $\mathcal{X}_{t,r,\ell}$ by each step of a promotion chain. However, in the data, we only observe snapshots of the Party Congresses after all the promotion chains are settled, $\mathcal{X}_{t,0,0}$. Thus, we drop the two subscripts that indexes the promotion chain and the level of the opening and simply refer to the state variable at the end of Party Congress t as \mathcal{X}_t .

We start with an arbitrary initial composition of the party hierarchy. For a given set of parameters, Θ , we simulate $S = 100$ congress histories, each of length $T = 20$. The paths of the state variable are defined as $\tilde{X}_s = \{\tilde{\mathcal{X}}_t\}_{t=1,\dots,T}$. We calculate the moments in the simulated data for each simulation, $m(\tilde{X}_s|\Theta)$, and take the average of the moments across simulations, $\hat{m}(\tilde{X}|\Theta) = \frac{1}{S} \sum_s m(\tilde{X}_s|\Theta)$.

Our Simulated Method of Moments (SMM) estimator chooses a vector of estimates, $\hat{\Theta}$, to minimize the distance between the model simulated moments, $\hat{m}(\tilde{X}|\Theta)$, and the empirical moments, $m(X)$.

$$\hat{\Theta} = \arg \min_{\Theta} \|\hat{m}(\tilde{X}|\Theta) - m(X)\|_W, \quad (11)$$

where W is the weighting matrix employed in the weighted distance $\|\cdot\|_W$.²⁸

not have enough power from the observed number of positions to identify level-specific support weights. Therefore, we assume a linear function for all the other levels and give an additional weight to the supreme leader.

²⁷This framework can potentially include more groups.

²⁸The details of the simulation procedure can be found in Internet Appendix IV.

Table 8 lists the empirical moments targeted by the estimator (11). The first set of moments relates to factional premia, which are estimated in Tables 2 and 3. Specifically, “Faction premia: CC/AC ratios” are defined as the ratio between promotion probability for a faction member in CC and a faction member in AC, normalized by the equivalent ratio for the unclassified politicians, $\frac{p_f(\ell=4)}{p_f(\ell=5)} \left(\frac{p_0(\ell=4)}{p_0(\ell=5)} \right)^{-1}$. The corresponding promotion probabilities are estimated in Table 2. This moment helps identify the slope of promotion utility gains. Intuitively, a higher CC/AC ratio implies a promotion at a high level generates greater utility gain relative to a promotion at a low level. “Faction premia: leader” are defined in equation (1) as the coefficients of the interaction between the faction of the candidate and the faction of the supreme leader, β_{f1} . “Faction premia: SC share” are defined in equation (1) as the coefficients of the interaction between the faction of the candidate and the share of seats in the Politburo Standing Committee, β_{f2} . “Faction premia: intercept” are defined in equation (1) as the coefficients of the faction of the candidate, β_{f0} . This set of moments helps identify faction cohesion parameters for each faction. Intuitively, a faction is more cohesive if having cofactional leaders occupying important positions helps other cofactional members get promoted. The differences in the premia across supreme leader, SC members, and rank and file help identify the weights of the support from different positions.

The second set of moments relates to the same-faction pair discounts, which are constructed as the ratio between the predicted probability of the No.1 politician being a member of faction f conditional on the No.2 politician being from the same faction, over the predicted probability of the No.1 politician being a member of faction f conditional on the No.2 politician being from a different faction, $\frac{\Pr(\text{Faction1}=f|\text{Faction2}=f)}{\Pr(\text{Faction1}\neq f|\text{Faction2}=f)}$. The corresponding probabilities are estimated using the values in Table 5. This set of moments helps identify parameters on private benefits. Intuitively, higher private benefits lead to more collusion in same-faction pairs. Anticipating this, there will be more opposition to form same-faction pairs in the first place. This set of moments also helps identify faction cohesion because a more cohesive faction leads to more collusion, and consequently, faces more opposition to form same-faction pairs.

The last empirical moment is the R-squared explained by faction or ability related characteristics, which are estimated in Table 3. This moment helps identify the intercept of promotion utility gains.

7 SMM Results

7.1 Parameter estimates

Table 9 presents the results. The estimates indicate that the cohesion levels of CYLC and Shanghai Gang are significantly larger than 0. We estimate $\theta_1 = 0.82$ for CYLC and $\theta_2 = 0.85$ for the Shanghai Gang, which both imply that cofactional members have a strong incentive to support their own candidates. These results confirm, in our data, the previous scholarly observation that the CYLC and Shanghai Gang appear to be cohesive factions (Bo, 2008). Notice, however, that even for the CYLC and Shanghai Gang, the cohesion parameters are still below 1: although faction members care about each other, they also

do not coordinate perfectly. We can reject both $\theta_1 = 1$ and $\theta_2 = 1$ at standard significance levels.

The cohesion parameter for Princelings, θ_3 , is different. There is heated debate among scholars of elite Chinese politics as to whether descendants of veteran party leaders operate as a unified faction. Some argue that the number of Princelings has been rising steadily within the top ranks of the party because many share the same family background and act in tandem. In contrast, others argue that Princelings may simply be individuals endowed with a large network of connections to political power brokers, and they do not necessarily need to bond with each other to be promoted. One anecdotal observation supporting the latter hypothesis comes from the downfall of a prominent Princeling, Bo Xilai, exactly at the time when Xi Jinping, of equal rank as Bo at the time, ascended to the paramount leadership.

We find that the estimated cohesion of the Princelings group is small. Statistically, θ_3 is indistinguishable from zero. The low estimate reflects the lack of coordination within the group. For instance, as Xi ascended to the paramount position during the 18th Congress as a member of a putative Princeling faction, other Princelings did not enjoy a higher premium in promotions. This finding alone *prima facie* violates one of the crucial features of factional politics – delivering benefits to members of the faction once the faction leader is in power – and appears in stark contrast to what we have already observed for the broadly accepted factions, CYLC and Shanghai Gang, where we estimate θ_1, θ_2 well in excess of 0. The evidence suggests further that, within the CCP, members of the Military also do not act as a cohesive faction, at least not like the CYLC and Shanghai Gang.²⁹

It is worth noting that this structural test of factions is not driven mechanically by the *ex post* success of a certain group of politicians. For instance, Princelings are overall quite successful in their individual careers. However, they do not display characteristics of a cohesive faction because (a) the progression of a Princeling does not benefit other Princelings and (b) other politicians do not attempt to prevent two Princelings from occupying the same leadership node, suggesting Princelings do not seem to act in tandem. As a result, the cohesion estimates of Princelings are quite low.

Our analysis also allows us to examine the influence of the supreme leader in promotions, ω_2 , and provides a quantification of relative power. This parameter reveals that the support from the supreme leader accounts for 16.5 percent of total support, which is a statistically significant and a substantial fraction. An SC member who is not the supreme leader accounts for 8 percent of the total support. Although the supreme leader has twice greater weight than an SC member, ω_2 is estimated well below 100 percent, implying that support from other top leaders also matters in the promotion. This result is consistent with Jia et al. (2015), who find that connections between provincial leaders to the top seven or nine party officials in the SC matters for their promotion. Collectively, the eight highest-ranking leaders account for 72.5 percent of total support, and the remaining 338 members of the Central Committee account for 27.5 percent of the total support. The estimated distribution of power in the party hierarchy

²⁹The online appendix also tests for cohesion in the sub-set of former military connected through their participation in the Korean War. We again find no evidence of faction-like behavior displayed by this group. In the online appendix, it is also shown that the estimates obtained for the CYLC and Shanghai Gang are similar when restricted to the post 1982 period.

is consistent with a “collective leadership” system that emerged after Deng Xiaoping, albeit a very top-heavy one, and the estimates are driven in our model by the pattern of correlation of promotions across levels and factions.

Finally, Table 9 allows us to examine the value of private benefits generated by a political position. We find the estimate of both slope and intercept is significantly positive, which implies that cofactionals have a strong incentive to collude if a faction controls both positions in a leadership node. This also implies that other factions will provide extra support to their candidates to contest nodes and avoid dominance by one faction, a crucial feature in reconciling the stylized facts of section 4.

7.2 Untargeted moments and model dynamics

Given our estimates, we can now examine how the model performs in matching a set of moments not targeted in the estimation. This is a first, important check of the out-of-sample potential of the model.

Table 10 shows the faction shares in each level of the Congress predicted by the model (upper panel). Consistently with the data reported in Table 1, our model successfully generates an increasing presence of CYLC and Shanghai members at higher level positions in the CCP. This result is remarkable because these moments are fairly removed from those targeted in our estimation. Instead, matching these moments is driven by the endogenous support from cohesive factions. If we were to instead assume faction cohesions are all zero, then the increasing presence of CYLC and Shanghai members at the higher level of party hierarchy would disappear. This is shown in the bottom panel of Table 10.

Figure 2 provides a visual representation of the faction seat shares predicted in the model over time. The red, blue, yellow, green bars represent the seat shares of the CYLC, Shanghai Gang, Princelings, and Military, respectively. Our baseline model successfully matches several patterns in the data. First, powerful political factions emerge endogenously at the top levels of the party hierarchy from a combination of talented individuals born into this group and cohesive social ties. The power of a faction also fluctuates due to the stochastic component of promotions, retirements, and the entry process.

Second, the seat shares of a faction at lower levels of the hierarchy are positively correlated with the seat shares of that same faction at higher levels. Importantly, this is only true for cohesive factions such as CYLC and Shanghai Gang. For non-cohesive groups, such as Princelings and the Military, this correlation is close to zero.

Third, although factions enjoy an advantage in promotions, no faction appears to consistently dominate the party’s highest echelons. The intuition, as predicated by our model, is that competition among cohesive factions is at the core of this finding. Cross-balancing forces constantly act against leadership dyads being controlled by the same faction. In other words, resistance from all party members coalescing to avoid local monopolies acts as a buffer against the rise of a single dominant faction.

To conclude our quantitative exercise, we employ our model to forecast the 19th Party Congress in 2017. Although admittedly streamlined, to the best of our knowledge, this is probably one of the very few rigorous quantitative environments allowing for a predictive exercise of this kind. Table 11 presents the actual and predicted factional composition in the 19th Party Congress, which is not used

in estimation.

As it can be seen, factional compositions are remarkably close to the data. The root mean squared error of the baseline faction model is 0.519. Since there are four factions and five levels, the prediction error per faction-level combination is $0.516/20=0.026$. The empirical performance with regard to the 19th Party Congress appears reassuring of the predictive validity of the model’s specification and complements our results on untargeted moments.

8 Counterfactual analysis

Since the founding of the People’s Republic of China in 1949, the internal organization of the CCP have experienced dramatic changes. The era of Mao featured strongman politics and centralized power, while Deng’s reforms established collective leadership and a system of checks and balances among factions. These structural changes in the political organization of the CCP have had aggregate economic consequences.³⁰

With the caveat that many subtle elements of the CCP are necessarily omitted in this exercise, we use the estimated structural model to conduct a set of counterfactual simulations. We evaluate the performance of different regimes using three measures: efficiency, malapportionment, and instability.

The first measure is economic efficiency, which is defined as aggregate economic output generated by each position in the hierarchy. Economic efficiency depends on the abilities of the politicians occupying each level of the pyramid and their incentives to provide public goods. These conditions change over time, so we indicate local output for politician i given conditions at t as $e_{i,t}$. We weight the local output by the economic importance of the position, V_ℓ , which is assumed to be proportional to the private benefit of this position. We divide the local output by 2 because the local output $e_{i,t}$ is jointly produced by a pair of local leaders. The total output at time t is therefore:

$$\text{Efficiency}_t = \frac{1}{2} \sum_i e_{i,t} V_\ell \quad (12)$$

The second measure is malapportionment, which is defined as the sum of absolute differences between the faction shares in the Congress t and the faction shares in the entry distribution then divided by 2:

$$\text{Malapportionment}_t = \frac{1}{2} \sum_f |n_{f,t} - \phi_f| \quad (13)$$

where $n_{f,t}$ is the share of faction f in Congress t and ϕ_f is the share of faction f the entry distribution. This definition follows the Loosemore-Hanby index used in the political science literature on proportionality of political systems (Loosemore and Hanby, 1971). Malapportionment measures how the shares of

³⁰Internet Appendix Figure 3 provides a VAR analysis which shows that structural changes in the political organization of the CCP is associated with significant changes in economic performance.

political groups at the highest levels of the party hierarchy differ from the entry distribution.³¹

The third measure is instability, which is defined as the sum of absolute differences between faction shares in Party Congress $t + 1$ and t then divided by 2:

$$\text{Instability}_t = \frac{1}{2} \sum_f |n_{f,t+1} - n_{f,t}| \quad (14)$$

where $n_{f,t}$ is the share of faction f in Congress t . Instability measures how stable the shares of political groups at the highest levels of the party hierarchy are over time. When instability is 0, there is no change in the faction composition between t and $t + 1$. The maximum possible value of instability is 1 which would occur if all the seats of the Congress shift from one faction to a different faction in two consecutive Congresses.

We start with the benchmark model estimated using data from the post-Mao era. The upper panel of Table 12 shows the estimates for the baseline model. 95 percent bootstrap confidence intervals are reported in the brackets below. The efficiency is normalized to 1. The malapportionment of the Central Committee is 0.034, while the malapportionment of the Politburo is 0.195. These estimates are comparable to malapportionment in other countries. For the sake of comparison, Samuels and Snyder (2001) construct a sample of 78 countries and find the malapportionments of lower and upper chambers are 0.046 and 0.311, respectively. The instabilities are 0.027 and 0.119 for the Central Committee and the Politburo, respectively. Both malapportionment and instability are increasing with the level of the hierarchy because there are fewer available positions at higher levels and each position has greater importance.

Given this benchmark, we can explore a set of counterfactual exercises relevant to the study of Chinese political economy. The list of our counterfactual simulations includes: (1) heightened factional politics, (2) foregone collective leadership, and (3) restricted private benefits for party cadres. The counterfactuals are reported in the bottom panel of Table 12. The results are expressed as a percentage change from the baseline scenario per year. The counterfactuals are also assessed in their precision by constructing 95 percent bootstrap confidence intervals. As it can be shown in our analysis, most results, but by all means not all, present confidence intervals excluding zero effects. This is important information for the readers willing to assess which margins are activated by each exercise.

8.1 Heightened factional politics

Since Mao Zedong, factions have been viewed as detrimental to the unity of the Party. For instance, in 2015, the Politburo declared that *“banding together in gangs, forming cliques for private ends, or forming factions is not permitted within the party”*. Despite longstanding party prohibitions against factionalism, our evidence shows that factions are still a pervasive and integral aspect of Chinese politics. In this

³¹When the malapportionment is 0, the faction composition in the higher level of the party hierarchy mirrors the composition in the entry distribution. The maximum possible value of malapportionment is 1, which would occur when one faction gets all the seats but the share of this faction in the entry distribution goes to zero.

counterfactual exercise, we conduct a set of simulations to assess how factional politics may affect the dynamics of the Chinese regime.

First, we simulate the case in which faction cohesion parameters θ are all set to zero. This is the first-best benchmark in our model, because all promotions now become purely merit-based and the provision of public goods in all the hierarchy nodes is maximized. As a result, efficiency increases by 6.88 percent compared with the baseline case. This result is also statistically precise, based on the 95 percent confidence interval. Furthermore, the malapportionment of the Politburo decreases by 40.86 percent. As a simple reference and with the caveat that institutional differences must be taken into account, such a change would move China from the 12th percentile to the 5th percentile of Samuels and Snyder (2001)'s sample of upper chambers. Similarly, the malapportionment of the Central Committee decreases by 3.52 percent. The absence of factional politics also reduces the instability of the faction shares: the instability of the Central Committee and the Politburo decreases by 0.71 percent and 13.91 percent per year, respectively.

Second, we consider the counterfactual in which one faction becomes perfectly cohesive. Specifically, we increase the cohesion parameter of faction 1 from the baseline value of 0.82 to 1. Now, efficiency suffers a 3.38 percent decrease compared to the baseline case. The reason is that factional considerations overtake individual merit as the main driver of promotion decisions within the hierarchy, lowering the ability of politicians rising through the ranks. In addition, there is an under-provision of public goods at leadership nodes when two cofaction members are paired. Notice that anticipating more collusion, politicians from other factions increase their support to candidates from rival factions, which limits the effect of a perfect cohesive faction. The malapportionment of the Central Committee increases slightly by 0.03 percent, while the malapportionment of the Politburo increases by 6.24 percent. The result that faction cohesion has a larger effect on the Politburo is consistent with the idea that faction consideration becomes more important at higher levels of the party hierarchy. The instability of the Central Committee decreases slightly by 0.69 percent, while the instability of the Politburo increases by 1.35 percent.

Third, we consider a counterfactual scenario in which all factions become simultaneously more cohesive. Efficiency severely deteriorates by -4.84 percent, because factional considerations become more prevalent in the promotion decision and cofactionals are more likely to be paired. Heightened faction politics increases the malapportionment and instability of the Politburo by a statistically significant 10.32 percent and 3.09 percent, respectively, but the effects on the Central Committee are modest.

To summarize, this set of counterfactual analyses confirms that factions play an important role in Chinese politics. However, heightened factional politics are not unambiguously detrimental to the politico-economic performance of the regime, as the estimated strength of checks and balances among factions is sufficient to avoid the prevalence of a dominant faction and hence stifling promotions of low ability members of that group.

8.2 Foregone collective leadership

We then explore a counterfactual on factional premia. Our model explicitly recognizes such premia (see section 4), but a wealth of anecdotal discussion in China scholarship (and the empirical evidence of section 4) suggests them to have been curtailed in the post-Mao era.

This peculiarity of the Chinese system under Deng Xiaoping, the emergence of so-called “collective leadership”, has been frequently recognized in the literature. It is often indicated as the main structural break from the strongman political equilibria thought to have prevailed under Mao Zedong (Tsou, 1995; Fewsmith, 2001; Shambaugh, 2008).³² In recent years, some scholars like Nathan (2016) suggest President Xi may be “*overturning Deng’s system*”, as he “*has taken the chairmanship of the most important seven of the twenty-two leading small groups that guide policy in specific areas*” and “*tightened direct control over the military*”. However, other scholars like Li (2017) observe that “*the composition of the newly-formed Politburo Standing Committee suggests that Xi compromised with competing factions*”.

Here, we ramp up the limited role played by leadership premia in factional representation in China and present a counterfactual of what would have happened under winner-take-all competition in which the support weight for the supreme leader is set to 100 percent. We find that efficiency decreases by 11.19 percent. The 95 percent confidence interval of this estimate ranges from -12.73 to -9.69 percent. Two related mechanisms result in the reduction in efficiency: (i) more pairs of the supreme leader’s cofactionals appear at the same node within the hierarchy due to a lack of checks and balances from other factions, limiting public good provision; and (ii) the top leader is able to promote more of his/her faction members, who do not necessarily all have high ability. The first mechanism explains around 90 percent of the decline in efficiency based on our estimated parameters, suggesting that providing the right incentives to local leaders through checks and balances may matter more than selecting high-ability politicians.

Interestingly, an increase in leadership premia does not necessarily increase malapportionment. Instead, we find the Central Committee and the Politburo experience slight reductions in malapportionment of 1.67 percent and 3.53 percent, respectively. This result appears surprising, as cofactional members of the supreme leader occupy a disproportionate number of seats, which should increase malapportionment. However, as power concentrates in the supreme leader, other cohesive factions effectively lose their power to obtain disproportionate shares of seats, which lowers the overall malapportionment. The confidence intervals of these estimates are also tight.

The effect of an increase in leadership premium on instability is ambiguous because of two counter-vailing effects. On the one hand, promotions become predictably biased towards the supreme leader’s faction, which tends to reduce instability. On the other hand, whenever the supreme leader retires and a new leader from a different faction takes control, the party hierarchy experiences dramatic shifts, which tend to increase instability.

³²“*During the Maoist era, factions were ideologically as well as personally defined, and remained fiercely loyal in what could become a winner-take-all game.*” Dittmer (2004, p.18)

8.3 Restricted private benefits

Finally, we conduct a counterfactual on the private benefits of providing public goods. We find that a 50% reduction in the private benefits lowers efficiency by 2.84 percent because politicians have lower incentives to provide public goods. Furthermore, a lower private benefit reduces the opposition from rival factions for cofactional pairs increasing malapportionment and instability. As a result, more cofactional pairs emerge, which lower efficiency further. Our results here are consistent with Chen and Zhong (2017) who document that visits by Provincial Committees of Discipline Inspection have significant negative effects on local new business entry. The discussion in Bai et al. (2019) concerning the role of rents within the Chinese economic system before 2012 also appears in line with these findings.

Notice, however, that our result captures only one possible channel of the anti-corruption campaign, that is, decreasing the private benefits of public good provision. In reality, the anti-corruption campaign could enhance the formal incentive mechanism for politicians, which may lead to a more public good provision in the long run.

9 Conclusion

We present an economic model of the internal organization of the Chinese single-party regime, where explicit factional dynamics within the party hierarchy enrich a problem of career concerns of political cadres. Our model offers a series of novel insights on the role of factions within the regime in a microfounded setting. We validate our mechanisms empirically by employing a rich data set on the career profiles of top CCP members in post-Mao China. A set of previously unexplored empirical regularities within Chinese elite politics is probed and discussed. We structurally estimate the model and explore counterfactuals pertinent to the Chinese historical case and useful to answer a series of questions relevant to the future political economy of the Chinese system.

At the time of writing, the CCP appears to be in a state of flux. The 20th National Party Congress concluded with the appointment of Xi Jinping to an unprecedented third five year term as CCP General Secretary. This coincided with the removal of all CYLC and Shanghai Gang faction members from the Politburo Standing Committee. Xi's probable third term was signalled well in advance of the 20th Congress and led many commentators to posit the end of the Deng initiated period of collective leadership, and to the termination or lessening of factional influence within the CCP (Shirk 2018). As the system in China continues to evolve, new data will become available, which will in turn allow some of these conjectures to be assessed through the lenses of our quantitative model or of competing alternatives.

The development of such alternatives and improvements in the ability of quantitative political economy models to fit empirical moments beyond what is presented in this article is a fruitful area of future research in the study of autocracy and China.

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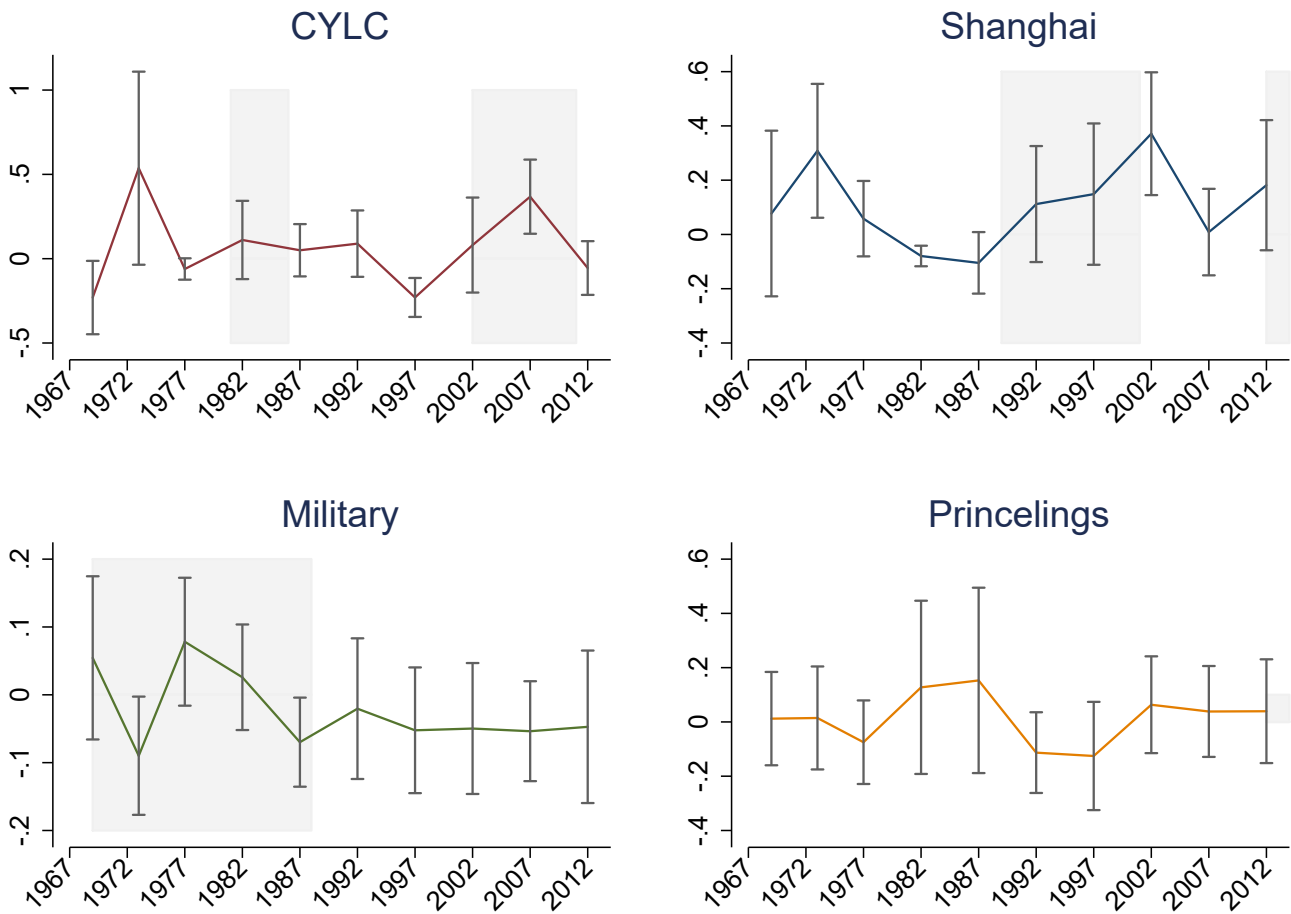


Figure 1: Leadership Premium in Promotion Rates of Each Faction

This graph shows the leadership premium in promotion rates of each faction in the Central Committee over time. The leadership premium in promotion rates is defined as the regression coefficients of promotion dummy on faction affiliation. The regression is repeated for each session of the Central Committee. The capped spikes indicate the 95 percent confidence intervals of the estimates. The shaded area indicates that the General Secretary of CCP is from the same faction.

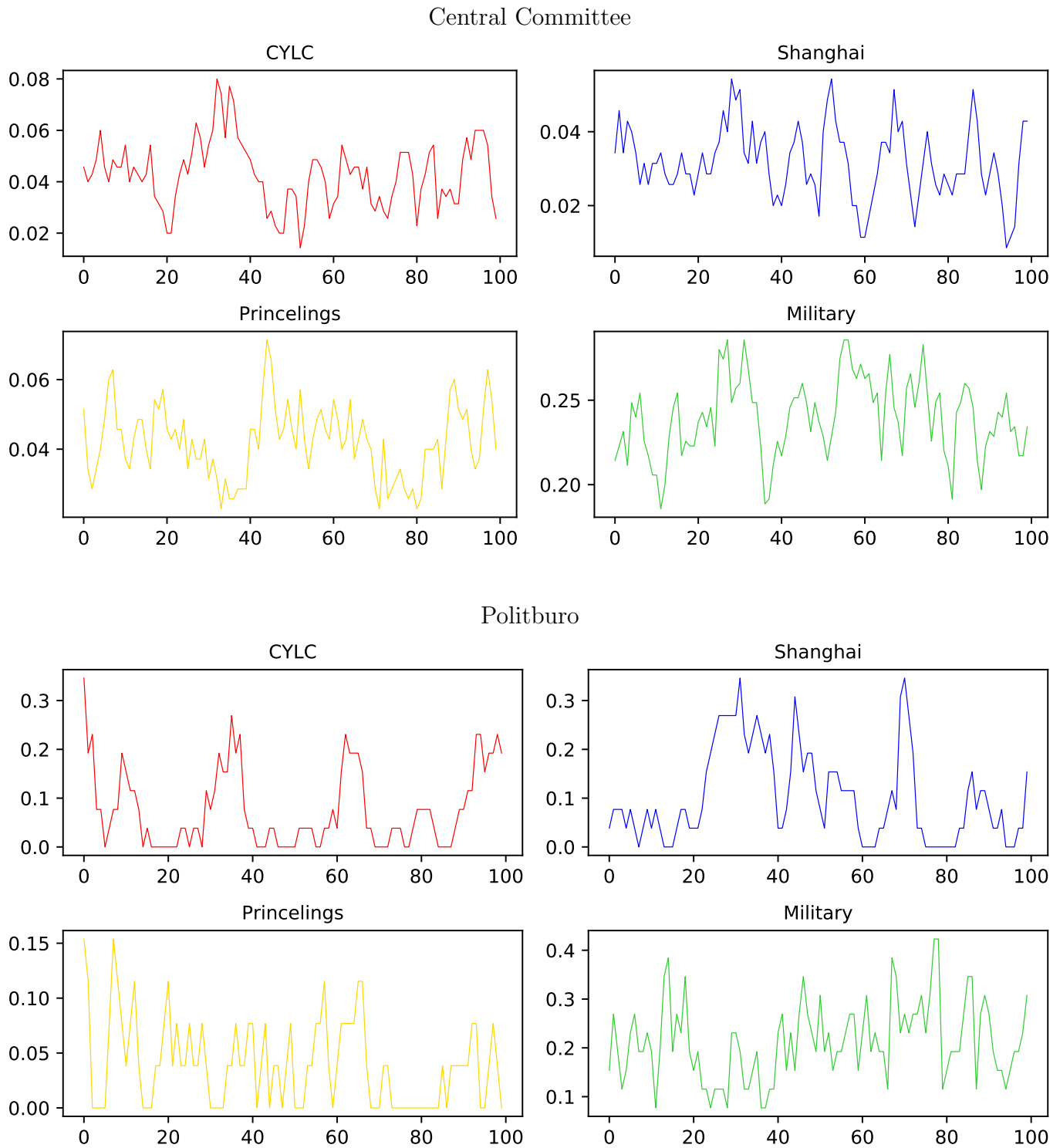


Figure 2: Simulated Path of Faction Shares

This graph shows a simulated path of faction seat shares in the Central Committee and the Politburo. The red, blue, yellow, and green lines represent the CYLC, Shanghai, Princlings, and Military, respectively. The upper panel represents the Central Committee (CC and AC) and the lower panel presents the Politburo (PB, SC, Top two leaders). The model is estimated using the 11th to 18th Central Committees.

Table 1: Summary Statistics of Central Committee Members

This table shows the summary statistics of the members of the 8th to 18th Central Committees (1956–2017). We report the mean and the standard deviation below in parentheses. Gender equals 1 if a member is male, 0 otherwise. College equals 1 if a member has a college degree, 0 otherwise. GradSchool equals 1 if a member has a post-graduate degree, 0 otherwise. Abroad equals 1 if a member has studied or worked abroad, 0 otherwise. Mishu equals 1 if a member has been worked as a personal secretary of prominent politicians, 0 otherwise. EthnicMinor equals 1 if a member is an ethnic minority, 0 otherwise. Promotion equals 1 if a member is promoted in the next session of Central Committee, 0 otherwise. Retirement equals 1 if a member retires after the current session of Central Committee, 0 otherwise. CYLC/Shanghai/Military/Princelings equals 1 if a member is from CYLC/Shanghai/Military/Princelings faction, 0 otherwise.

	Top leader	SC	PB	CC	AC
CYLC	0.292 (0.464)	0.097 (0.301)	0.109 (0.312)	0.054 (0.226)	0.040 (0.196)
Shanghai	0.250 (0.442)	0.161 (0.374)	0.130 (0.338)	0.046 (0.210)	0.034 (0.181)
Military	0.250 (0.442)	0.129 (0.341)	0.283 (0.452)	0.282 (0.450)	0.180 (0.385)
Princelings	0.208 (0.415)	0.097 (0.301)	0.109 (0.312)	0.044 (0.205)	0.029 (0.167)
Male	1.000 (0.000)	1.000 (0.000)	0.942 (0.235)	0.949 (0.220)	0.875 (0.331)
Age	64.750 (9.143)	64.935 (4.082)	62.920 (7.061)	59.276 (5.907)	52.839 (6.330)
College	0.750 (0.442)	0.935 (0.250)	0.804 (0.398)	0.755 (0.430)	0.828 (0.378)
GradSchool	0.167 (0.381)	0.097 (0.301)	0.152 (0.360)	0.191 (0.393)	0.346 (0.476)
Abroad	0.417 (0.504)	0.129 (0.341)	0.181 (0.387)	0.088 (0.283)	0.128 (0.335)
Mishu	0.000 (0.000)	0.097 (0.301)	0.101 (0.303)	0.066 (0.249)	0.040 (0.196)
EthnicMinor	0.000 (0.000)	0.000 (0.000)	0.051 (0.220)	0.077 (0.267)	0.139 (0.346)

Table 2: Faction Affiliation and Promotion

This table shows panel regressions of promotion on the faction affiliation. The sample includes all the members of the 11th to 18th Central Committees (1977-2017). Promotion is a dummy that equals 1 if a Central Committee member moves up in the levels of Central Committee, 0 otherwise. Control variables include gender, college degree, graduate degree, mishu dummy, ethnic minority, abroad experience dummy, age, age square, and age cube. Robust standard errors are reported in brackets. ***, **, * indicates 1 percent, 5 percent, and 10 percent significance level, respectively.

	(1)	(2)	(3)
	Promotion	Promotion	Promotion
CYLC	0.121*** [0.0348]	0.171** [0.0770]	0.134*** [0.0315]
Shanghai	0.0839** [0.0347]	0.0879 [0.0778]	0.0542* [0.0318]
Princelings	0.0643* [0.0370]	0.0482 [0.0853]	0.104*** [0.0331]
Military	-0.0352* [0.0183]	-0.0525 [0.0395]	-0.00566 [0.0159]
Sample	All	AC	CC
Individual Attributes	Yes	Yes	Yes
Level F.E.	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes
Observations	2296	983	1193
Adj. R-squared	0.14	0.10	0.04

Table 3: Faction Affiliation, Supreme Leader Faction, and Promotion

This table shows panel regressions of promotion on the faction affiliation of Central Committee members interacting with the affiliation of the General Secretary. The sample includes all the members of the 11th to 18th Central Committees (1977-2017). Promotion is a dummy that equals 1 if a Central Committee member moves up in the levels of Central Committee, 0 otherwise. Control variables include gender, college degree, graduate degree, mishu dummy, ethnic minority, abroad experience dummy, age, age square, and age cube. Robust standard errors are reported in brackets. ***, **, * indicates 1 percent, 5 percent, and 10 percent significance level, respectively.

	(1)	(2)	(3)
	Promotion	Promotion	Promotion
CYLC*CYLC leader	0.252** [0.0987]	0.243** [0.0959]	0.286*** [0.0977]
CYLC*CYLC SC share	0.636 [0.538]	0.556 [0.523]	0.516 [0.530]
Shanghai*Shanghai leader	0.148** [0.0708]	0.129* [0.0689]	0.108 [0.0702]
Shanghai*Shanghai SC share	0.666*** [0.217]	0.599*** [0.211]	0.634*** [0.215]
Princelings*Princelings leader	0.0679 [0.0895]	0.0667 [0.0871]	0.0334 [0.0888]
Princelings*Princelings SC share	-1.731** [0.676]	-1.347** [0.658]	-1.353** [0.671]
Military*Military leader	0.122* [0.0724]	0.0820 [0.0705]	0.177* [0.0911]
Military*Military SC share	-0.0987 [0.110]	-0.0939 [0.107]	-0.244* [0.135]
Sample	All	All	All
Individual Attributes	Yes	Yes	Yes
Level F.E.	No	Yes	Yes
Year F.E.	No	No	Yes
Observations	2296	2296	2296
Adj. R-squared	0.10	0.15	0.15

Table 4: Frequency of Factional Mix

This table shows the frequency of the factional mix of the top 2 officials in the same political office. The provincial positions include 31 provincial and municipal units (Secretary and Governor). The national positions include Politburo Standing Committee (two highest-ranking members), PRC presidency (President and Vice President), the State Council (Premier and Executive Vice Premier), Central Military Committee (Chairman and Executive Vice Chairman), CCP Secretariat (two-highest ranking secretaries), NPC (Chairman and Executive Vice Chairman), CPPCC (Chairman and Executive Vice Chairman), the Supreme People’s Court (President and Executive Vice President). The sample period is from 1992 to 2015.

Empirical frequency						
	CYLC	Shanghai	Princelings	Military	Others	Total
CYLC	2.20	1.29	3.49	1.03	14.23	22.25
Shanghai	2.46	0.00	1.16	0.65	1.16	5.43
Princelings	2.59	1.03	0.39	0.39	5.17	9.57
Military	0.91	0.00	0.00	0.00	0.91	1.81
Others	10.35	2.07	2.72	0.65	45.15	60.93
Total	18.50	4.40	7.76	2.72	66.62	100.00
Counterfactual frequency under a random matching						
	CYLC	Shanghai	Princelings	Military	Others	Total
CYLC	4.12	.98	1.73	.61	14.82	22.25
Shanghai	1.00	.24	.42	.15	3.62	5.43
Princelings	1.77	.42	.74	.26	6.38	9.57
Military	.33	.08	.14	.05	1.21	1.81
Others	11.27	2.68	4.73	1.66	40.59	60.93
Total	18.50	4.40	7.76	2.72	66.62	100.00
Ratio between empirical frequency and counterfactual frequency						
	CYLC	Shanghai	Princelings	Military	Others	Total
CYLC	.53	1.32	2.02	1.70	.96	22.25
Shanghai	2.45	.00	2.75	4.40	.32	5.43
Princelings	1.46	2.45	.53	1.50	.81	9.57
Military	2.72	.00	.00	.00	.75	1.81
Others	.92	.77	.58	.39	1.11	60.93
Total	18.50	4.40	7.76	2.72	66.62	100.00

Table 5: Factional Mix: Regression Evidence

This table shows panel regressions of the factional affiliation of the number 1 official on the number 2 official in the same political office. Variable CYLC1 (CYLC2) is a dummy which equals 1 if number 1 (2) official is from the CYLC faction. Shanghai1, Shanghai2, Princlings1 Princlings2, Military1, and Military2 are defined similarly. Standard errors are clustered at the year level. ***, **, * indicates 1 percent, 5 percent, and 10 percent significance level, respectively. The sample period is from 1992 to 2015.

	(1)	(2)	(3)
	CYLC1	CYLC1	CYLC1
CYLC2	-0.132** [0.0534]	-0.0752 [0.0565]	-0.388*** [0.103]
Sample	All	Provincial	National
Observations	773	627	146
Adj. R-squared	0.014	0.003	0.124

	(1)	(2)	(3)
	Shanghai1	Shanghai1	Shanghai1
Shanghai2	-0.105*** [0.0317]	-0.0314** [0.0150]	-0.471*** [0.110]
Sample	All	Provincial	National
Observations	773	627	146
Adj. R-squared	0.006	-0.000	0.126

	(1)	(2)	(3)
	Princlings1	Princlings1	Princlings1
Princlings2	-0.0496 [0.0500]	-0.0785*** [0.0231]	-0.117 [0.0988]
Sample	All	Provincial	National
Observations	773	627	146
Adj. R-squared	0.001	0.002	0.009

	(1)	(2)	(3)
	Military1	Military1	Military1
Military2	0.228* [0.133]	-0.0289* [0.0166]	0.145 [0.186]
Sample	All	Provincial	National
Observations	773	627	146
Adj. R-squared	0.028	-0.001	0.009

Table 6: Time series correlations in faction power scores

This table shows the time series correlation in faction power scores. The sample is the 11th to 18th Central Committees (1977–2017). The dependent variable is the power score of a faction. The column title indicates the faction of interest. Robust standard errors are reported in brackets. ***, **, * indicates 1 percent, 5 percent, and 10 percent significance level, respectively. The coefficients on past power scores of competing factions should be positive according to the faction-balancing story.

	(1) CYLC	(2) Shanghai	(3) CYLC	(4) Shanghai	(5) Princelings	(6) Military
L.CYLC score	0.875*** [0.0939]	-0.0543 [0.0533]	0.833*** [0.110]	-0.118* [0.0590]	0.0841 [0.0541]	-0.416* [0.231]
L.Shanghai score	-0.0147 [0.319]	0.416** [0.160]	0.0829 [0.297]	0.483*** [0.151]	-0.0375 [0.151]	0.224 [0.649]
L.Princelings score			0.472* [0.269]	0.238 [0.148]	0.845*** [0.131]	0.935 [0.559]
L.Military score			0.112** [0.0486]	0.0308 [0.0274]	-0.0135 [0.0234]	1.036*** [0.0995]
Observations	35	35	35	35	35	35
Adj. R-squared	0.75	0.20	0.83	0.40	0.95	0.96

Table 7: Faction imbalance and promotion

This table shows panel regressions of promotion on the faction affiliation of Central Committee members interacting with faction imbalance. The sample includes all the members of the 11th to 18th Central Committees (1977–2017). The dependent variable, Promotion, is a dummy that equals 1 if a Central Committee member moves up in the levels of Central Committee, 0 otherwise. Faction imbalance is defined as the difference between current power score and the 10-year moving average. Control variables include gender, college degree, graduate degree, mishu dummy, ethnic minority, abroad experience dummy, age, age square, and age cube. Robust standard errors are reported in brackets. ***, **, * indicates 1 percent, 5 percent, and 10 percent significance level, respectively.

	(1) Promotion	(2) Promotion	(3) Promotion
CYLC*CYLC leader	0.281** [0.122]	0.273** [0.119]	0.308** [0.121]
CYLC*CYLC SC share	0.547 [0.679]	0.454 [0.685]	0.395 [0.695]
CYLC*CYLC imbalance	-1.345 [1.247]	-1.418 [1.228]	-1.308 [1.253]
Shanghai*Shanghai leader	0.0373 [0.111]	0.0208 [0.109]	0.0356 [0.111]
Shanghai*Shanghai SC share	0.790*** [0.255]	0.715*** [0.242]	0.694*** [0.243]
Shanghai*Shanghai imbalance	7.217 [4.418]	7.073 [4.526]	4.953 [4.608]
Princelings*Princelings leader	0.0683 [0.104]	0.0702 [0.102]	0.0411 [0.104]
Princelings*Princelings SC share	-1.622 [1.105]	-1.153 [1.084]	-1.124 [1.080]
Princelings*Princelings imbalance	0.576 [4.024]	1.158 [3.977]	1.298 [4.027]
Military*Military leader	0.199** [0.0820]	0.149* [0.0806]	0.295*** [0.107]
Military*Military SC share	-0.239* [0.132]	-0.216* [0.130]	-0.454*** [0.172]
Military*Military imbalance	0.328 [0.322]	0.280 [0.305]	0.508 [0.351]
Sample	All	All	All
Individual Attributes	Yes	Yes	Yes
Level F.E.	No	Yes	Yes
Year F.E.	No	No	Yes
Observations	2296	2296	2296
Adj. R-squared	0.10	0.15	0.15

Table 8: Moments for Structural Estimation

This table shows moments used in the SMM estimation. “Faction premia: leader” are defined as the coefficients of the interaction between the faction of the candidate and the faction of the supreme leader, which are estimated in Table 3. “Faction premia: SC share” are defined as the coefficients of the interaction between the faction of the candidate and the share of seats in the Politburo Standing Committee, which are estimated in Table 3. “Faction premia: intercept” are defined as the coefficients of the faction of the candidate, which are estimated in Table 3. “Faction premia: CC/AC ratio” is defined as the ratio between promotion probability for a faction member in CC and a faction member in AC, normalized by the same ratio for the unclassified politicians, which are estimated in Table 2. “Same-faction discounts” are constructed as the ratio between the predicted probability of the No.1 politician being a member of faction f conditional on the No.2 politician is from the same faction over the predicted probability of the No.1 politician being a member of faction f conditional on the No.2 politician is from a different faction using the estimates in Table 5. “Ability R-squared” is estimated in Table 3.

Moments	Actual	Simulated
Faction premia: leader, CYLC	0.286	0.090
Faction premia: leader, Shanghai	0.108	0.106
Faction premia: leader, Military	0.177	0.009
Faction premia: leader, Princlings	0.033	0.011
Faction premia: SC share, CYLC	0.516	0.351
Faction premia: SC share, Shanghai	0.634	0.420
Faction premia: SC share, Princlings	-1.353	0.038
Faction premia: SC share, Military	-0.244	0.037
Faction premia: CC/AC ratio, CYLC	3.232	3.545
Faction premia: CC/AC ratio, Shanghai	2.206	2.409
Same-faction discount: national, CYLC	0.776	0.527
Same-faction discount: national, Shanghai	0.829	0.501
Same-faction discount: provincial, CYLC	0.936	1.003
Same-faction discount: provincial, Shanghai	0.946	0.974
Ability R-squared, total	0.020	0.024

Table 9: Parameter Estimates

This table shows the estimated parameters of the SMM estimation. The data moments used by SMM estimation are described in Table 8.

Symbol	Parameters	Value	S.E.
θ_1	Faction cohesion, CYLC	0.820	0.035
θ_2	Faction cohesion, Shanghai	0.850	0.039
θ_3	Faction cohesion, Princelings	0.000	0.040
θ_4	Faction cohesion, Military	0.038	0.047
ω_1	Support, SC members	0.080	0.007
ω_2	Support, top leader	0.165	0.003
δ_0	Utility gain, intercept	0.112	0.003
δ_1	Utility gain, slope	0.005	0.000
v_0	Private benefits, intercept	0.595	0.262
v_1	Private benefits, slope	13.360	4.350

Table 10: Faction Shares by Level of Hierarchy

This table shows the simulated faction shares by level of the party hierarchy. The parameter values are described in Table 9.

Baseline faction model				
	CYLC	Shanghai	Princelings	Military
Top leader	0.233	0.117	0.029	0.183
SC	0.188	0.094	0.032	0.199
PB	0.099	0.056	0.038	0.227
CC	0.037	0.030	0.042	0.240
AC	0.037	0.029	0.043	0.234

Faction cohesion = 0				
	CYLC	Shanghai	Princelings	Military
Top leader	0.044	0.035	0.043	0.231
SC	0.044	0.035	0.042	0.231
PB	0.044	0.035	0.042	0.232
CC	0.045	0.035	0.042	0.232
AC	0.045	0.035	0.042	0.232

Table 11: Out-of-sample Forecasting of 19th Party Congress

This table shows the out-of-sample forecast of the composition of the 19th Party Congress. The upper panel shows the actual composition in the data. The lower panel shows the predicted composition.

Data				
	CYLC	Shanghai	Princelings	Military
Top leader	0.500	0.500	0.000	0.000
SC	0.000	0.400	0.000	0.000
PB	0.053	0.158	0.053	0.105
CC	0.101	0.067	0.011	0.191
AC	0.047	0.052	0.006	0.145
Predicted				
	CYLC	Shanghai	Princelings	Military
Top leader	0.500	0.500	0.000	0.000
SC	0.277	0.138	0.261	0.016
PB	0.263	0.138	0.088	0.119
CC	0.075	0.042	0.034	0.166
AC	0.034	0.025	0.041	0.213

Table 12: Counterfactual Simulation

The upper panel shows the economic efficiency, malapportionment, and instability of the baseline scenario. The lower panel shows the percentage change in these measures from the baseline scenario to various counterfactual scenarios. Bootstrap 95 percent confidence intervals presented in brackets are constructed using 500 bootstrap samples.

Baseline	Efficiency	Malapportionment (CC)	Malapportionment (PB)	Instability (CC)	Instability (PB)
	1.000 [0.994, 1.003]	0.034 [0.033, 0.034]	0.014 [0.192, 0.199]	0.027 [0.027, 0.028]	0.119 [0.118, 0.120]
Counterfactuals	% change from the baseline				
All cohesion=0	6.881 [6.442, 7.305]	-3.523 [-4.547, -2.252]	-40.857 [-41.894, -39.633]	-0.713 [-1.582, 0.335]	-13.913 [-15.016, -12.827]
Faction 1 cohesion=1	-3.376 [-4.130, -2.681]	0.029 [-1.246, 1.248]	6.235 [3.667, 8.878]	-0.689 [-1.874, 0.530]	1.352 [0.081, 2.561]
All cohesion=1	-4.838 [-5.563, -4.114]	0.542 [-0.866, 2.040]	10.321 [7.375, 13.536]	-0.190 [-1.222, 0.974]	3.088 [1.734, 4.450]
Dominant leader premia	-11.189 [-12.732, -9.692]	-1.666 [-2.825, -0.337]	-3.525 [-6.967, -0.155]	0.925 [-0.098, 2.064]	-0.717 [-2.152, 0.555]
Half private benefits	-2.840 [-3.611, -2.186]	-0.446 [-1.642, 0.947]	5.529 [2.743, 9.088]	-0.306 [-1.372, 0.899]	2.430 [1.152, 3.704]