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FACTIONS IN NONDEMOCRACIES: THEORY AND EVIDENCE FROM THE CHINESE COMMUNIST PARTY

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ABSTRACT

This paper investigates theoretically and empirically the factional arrangements and dynamics within the Chinese Communist Party (CCP), the governing political party of the People's Republic of China. Our empirical analysis ranges from the end of the Deng Xiaoping era to the current Xi Jinping presidency and covers the appointments of both national and provincial officials. We present a set of new empirical regularities within the CCP and a theoretical framework suited to model factional politics within single-party regimes.

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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 second largest economy and the most populous country in the world today[1]. This motivates the interest of political economists in the CCP.

The nontransparent and often informal nature of elite interaction within a country lacking competitive elections and with a rich history of informal political jousting among factional leaders raises formidable obstacles to a rigorous politico-economic analysis. The economic literature on the internal organization (and, we will see, factional competition) at the highest levels of the Chinese government is limited[2]. Political scientists focused on China studies have been more attentive, but also often more qualitative and descriptive, at least until recently[3].

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)[4]. 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). As reported in Nathan (2016): "*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.*"

Within this context, intra-elite competition is extremely hard to assess. The CCP officially rejects factional elite politics[5], but scholars since Nathan (1973)

[1] And plays a crucial role in steering economic activity in the country. See Bai, Hsieh, and Song (2016).

[2] The 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) focuses on the promotion profiles of provincial leaders and so does Jia, Kudamatsu, and Seim (2015). Work by Lau, Qian, and Roland (2000) models the process of reform under Deng Xiaoping and the reform era.

[3] Descriptive 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).

[4] At the time of writing. By 2016 the CCP membership has grown to 88.76 million.

[5] BBC, 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

have emphasized how the faction –intended as patron-client clusters of mutually linked officials– represents the correct unit of analysis of elite politics in China. Since Nathan (1973), evidence supporting this interpretation has also steadily accumulated (Pye, 1981; Dittmer and Wu, 1995; Nathan and Gilley, 2003; Shih, 2004; Li, 2012; Li, 2013; Shih, 2016; Meyer, Shih, and Lee 2016). The present paper follows this line of inquiry, but with special attention paid to individual incentives, supplying an inherently economic model of behavior, where "*lower-level officials [...] join factions in order to secure promotions and other regime goods from powerful patrons*" (Shih, 2016, p.1) and where promotion dynamics throughout the party hierarchy are microfounded and characterized. A theoretical contribution of this paper is in the formal model of factional interaction that we present.

In our model factions operate within a given party hierarchy. On the one hand, the advantage of factions is that they provide support to their members in obtaining promotions up the pyramid. On the other, factions allow the allocation of that support to be decided by senior affiliates, with the possibility of junior members being blocked by higher ranked cofactionals keen to avoid promoting colleagues who will compete with them for future openings. A faction member, though potentially benefiting from cofactional support, has to bide his time and wait for the seniors in his faction to allow that support to materialize. The seniors make this decision based on their own career objectives, so that a junior member's ascendancy through the hierarchy is tethered to the rise of the relevant seniors above him. Unaffiliated (neutral) politicians face no such restrictions, and this is why neutrals can also emerge in equilibrium. Though they do not enjoy factional support, they are also not restricted in their capacity to contest openings higher up. The analysis of the costs and benefits of joining factions is complicated by the dependence of promotion opportunities on the factional composition of every level of the hierarchy at any point in time. This determines what kind of openings may arise and who is in a position to block advancement at any level, a problem that we study in detail.

Our theoretical results are important in matching empirical moments in terms of factional composition, promotion rates, and the effects of changes in the factional identity of the top leadership in China. Absent hard and verifiable information, we rely on the extant discussion of Chinese elite politics to identify a minimal set of factions within the CCP. Factions have historically emerged

people.'" http://www.bbc.com/news/blogs-china-blog-30685782

within the CCP through close personal connections with prominent patrons (e.g. in the cases of former General Secretary Jiang Zemin and his successor, Hu Jintao) to mutually foster the career prospects of affiliated cadres, and do not necessarily represent specific territorial or economic interest groups (Dittmer, 1995). As we discuss in Sections 2 and 3, this paper will lever only the most obvious factional links identified within the CCP, links based on affiliation to the Communist Youth League of China (related to General Secretary Hu Jintao) or to the so-called Shanghai Gang (affiliated most prominently with Jiang Zemin and levering on the special status of Shanghai in Chinese politics).

Scholars such as Shih, Shan, and Liu (2010), Shih, Adolph, and Liu (2012), Jia et al. (2015) have explored methodologies for the imputation of factional linkages based on place of birth, university ties, and shared career profiles[6]. 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 will be evident in our statistical analysis. Based on our factional definitions and within a proximate set of party officials of almost equivalent rank in the same office and area (e.g. the number 1 and number 2 highest ranked party members in a province), we show that members of a faction (let us call it B) are virtually never paired with members of the same faction B at the same office. On the contrary, they are paired with members of a rival faction (R) beyond what would be predicted by random chance alone. For instance, if a province has a B faction Party Secretary (ranked number 1), the Governor (his number 2) is likely to be an R, possibly a neutral official, but most definitely not a B faction member. Thus simply sharing part of their career paths may not be informative of factional affiliation for CCP elite officials, in fact our evidence shows it may mislead completely.

The statistical analysis of these systematic factional cross-patterns in top CCP positions is new to the literature and will be discussed in Section 4. In addition to studying these cross-factional patterns, Section 4 reports statistically significant premia in terms of promotion rates and post allocations to a leader's cofactionals. That factions may deliver advantages to their members is a necessary condition for our model's coherence. But the existence of precisely estimated leadership premia points also in the direction of factions both being

[6] Shih (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.*"

reasonably identified within our analysis and of operative relevance within the CCP.

We formally explore and test for the presence of additional factions. This is possible within our setting thanks to the structural econometric approach we follow. We directly bring our model to the data, obtain estimates of the primitive parameters (such as leadership premia and parameters governing the contest functions for promotion) and formally test our mechanism against alternatives, including mechanisms based on pure seniority or meritocracy. Our factional model displays excellent in-sample and out-of-sample fit. We show how the estimated leadership premia in the CCP are quantitatively substantial, but quite far from winner-take-all levels, and that the intra-faction competition among faction members operates as a de facto endogenous dampening mechanism in slowing factional growth.

Our analysis includes several counterfactuals. We model possible institutional changes within the CCP, including the effect of increased leadership premia, which may indicate a break away from the "*collective leadership*" design envisioned by Deng. We also study the role of the identity of the top leadership, the factional role of princelings, and assess General Secretary Xi Jinping's factional affiliation.

Besides the politico-economic literature on Chinese elite politics mentioned above, this paper speaks to the literature on the internal organization of autocratic regimes. Francois, Rainer, and Trebbi (2015, 2016) discuss at length the importance of its connection to the expanding literature on the political economy of development. Most related to our work (and one of the first rigorous analyses of factional politics within the economic literature) is Persico, Rodriguez-Pueblita, and Silverman (2011), who present a theoretical model of endogenous factional growth and link it qualitatively to evidence from factional local politics in Mexico within the Institutional Revolutionary Party.[7]

From a theoretical perspective, Dewan and Squintani (2015) model endogenous faction formation (an issue we address in our setting as well, when characterizing the decision of party members to join a faction). The authors develop a model where incentives for faction formation are ideological rather than eco-

[7] See also Belloni and Beller (1978). Persico et al. (2011) also point out 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 Mershon, 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).

nomic (as in our setting and in Persico, Rodriguez-Pueblita and Silverman, 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.

The remainder of this paper is organized as follows. In Section 2 we provide a brief institutional overview of the CCP. In Section 3 we discuss our data, operationalize factions, and provide a descriptive analysis of our samples. Section 4 produces a set of stylized facts, some novel, useful to frame and guide the theoretical analysis. In Section 5 we discuss our theoretical setup and Section 6 develops our estimator. Our main empirical results are reported in Section 7. Section 8 presents our counterfactual exercises. Section 9 concludes.

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[8].

In 2016 the Chinese Communist Party, with its 88.8 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 figures of the General Secretary of the CCP and the second ranked member of the CCP, which 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 (PBSC), formed by the other 5 members and which represents the set of the highest ranked politicians in China. The PBSC 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

[8] See 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).

CCP and the interim plenary sessions fill retirements or deaths, granting promotions (and occasionally administer demotions). Typically, CC members include ministerial-level officials and provincial ranking officials, including Provincial Party Secretaries (the highest CCP post in a Province) and Governor (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 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.

Membership of the Communist Youth League of China (CYLC), an ancillary organization to the CCP responsible for the youth (members are typically between 4 and 28 years of age), has traditionally operated as an entry point in 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 the less prosperous ("red") regions[11]. Li (2012) associates with the CYLC "populist"

[9] See 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 chariman), 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.

[10] The 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% of the applications were accepted. http://news.xinhuanet.com/english/2016-06/30/c_135478976.htm

[11] Prominent members include current Premier Li Keqiang and former General Secretary

policies close to 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 been often employed to identify the patronage cluster close to Jiang and to the economic interests of the coastal (blue) provinces (Li, 2002).

Whether additional factional groups besides the CYLC and the Shanghai Gang may be present within the CCP is unclear and disputed even among scholars of Chinese elite politics. For instance, some observers point at the anomaly of the exceptionally rapid careers of sons and daughters of prominent party officials and revolutionary veterans under Mao, often referred to as "princelings". The analysis below will discuss this specific group of CCP members in detail.

3 Data

We combine two biographical databases of Chinese politicians. The first data source is China Vitae, which collects biographical information on more than 4,494 Chinese elites in government, politics, the military, education, business, and the media since 1992. Information provided by China Vitae includes gender, year of birth, place of birth, ethnicity, colleges attended, and career trajectory. Information in China Vitae comes from Chinese and English language web sites in China that are supported by or affiliated with the Chinese government.

Our second data source is a biographical database of CC members developed by Shih, Shan, and Liu (2008), and further updated by Lu and Ma (2015). This database contains all CC and AC members from the first Party Congress in 1921 to the eighteenth Party Congress in 2012. This data also provides biographical information and career trajectories similar to China Vitae. We focus our analysis on the period of 1956 to 2014, which starts from the first Party Congress since the founding of People's Republic of China (8th Party Congress in 1956) and ends with the most recent Central Committee (18th Party Congress in 2012), covering a total number of 1,853 individuals.

We combine these two data sources to construct our estimation samples. Whenever there is inconsistency between the two data sources, (e.g. multiple

and President of the PRC Hu Jintao.

politicians in the same position in the same year), we manually check with a third source, typically official websites affiliated with the Chinese government (e.g. www.xinhuanet.com; cpc.people.com.cn). We also collect provincial population and GDP data from China Data Online. The anti-corruption data originates from ChinaFile and China's Central Commission for Discipline Inspection (CCDI) website.

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, but also 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 exceptionality 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 has participated in the volunteer armies to Korea or Vietnam, or served as military personnel for more than half of its career after the founding of People's Republic of China. The restriction on the minimum time of military experience is to rule out civilian officials who work as the party secretary of a military region for a short period of time (e.g. Hu Jintao as the First Secretary of Guizhou Military District from 1985 to 1988), or civilian officials chair 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" (prominent examples include General Secretary Xi Jinping and disgraced former governor of Liaoning Bo Xilai). These four affiliations are not mutually exclusive (for example, Xi Jinping is both a princeling and an affiliated of the Shanghai Gang according to our definition) and not all party members in our sample are affiliated. In fact, we allow for politicians in our sample to also be unaffiliated (neutral, indicated as N).

Theoretically one could consider CYLC, Shanghai Gang, military, and princelings alternative political factions. In Section 4 we show however than only two of these groups, CYLC and Shanghai Gang, truly exhibit the features of political factions within the CCP. Formal statistical tests will be also developed and brought in support of this thesis. To distinguish, we will refer to princelings and military as "groups" and CYLC and Shanghai Gang as "factions".

The military is virtually a parallel structure with limited political control, while the princelings as a group are extremely heterogeneous and appear to operate as a set of neutral and independently powerful actors (in fact, often times in deep rivalry among themselves, such is the case of Bo Xilai and Xi Jinping). While we will keep track of all types of affiliations in the analysis that follows, we emphasize here that our theoretical and empirical design will separate CYLC and Shanghai Gang faction members from all other political actors, including the military and princelings, which we will deem "neutral". Because of the traditional coloring associated with these two established factions, we will also occasionally refer to the CYLC as the Red faction, R, and to the Shanghai Gang as the Blue faction, B.

Table 1 provides summary statistics of demographics and careers of $4,494$ politicians who held important positions in government, politics, the military, education, business, and the media in China since 1992. The unit of observation is a position-individual pair. We classify the organizations into 12 categories: party apparatus, government, military, People's Congress, Chinese People's Political Consultative Conference (CPPCC), court, procuratorate, CYLC, business, media, education, and an unclassified category. The average duration of each position is about 4 years, and the age of starting each position varies from the early 30s (CYLC) to the late 50s (People's Congress). Individuals who hold these positions are predominately male, which reflects the large gender imbalance at the top levels of government and business in China[12]. Ethnicity is predominately Han, reflective of the ethnic composition in the Chinese population. The last four columns provide the frequency of the various affiliations in each type of organization. CYLC members tend to work in the party apparatus and media instead of the government system.[13] The Shanghai Gang is more evenly distributed across all types of organizations. Princelings are more likely to have experience in the military, but are less likely to work in the legal system (court and procuratorate), potentially due to the fact that the power of the judiciary is relatively muted in China.

We then turn our focus to a subset of elites, the members of Central Committees of the CCP. This is a group of around 400 people who comprise the CCP top leaders. Table 2 provides the demographics and the factional affilia-

[12] 25.1% of CCP members were women in 2016.

[13] This is consistent with the anecdotal discussion of Hoffmann and Enright (2008) that CYLC leaders often have experience in non-economic fields, such as party organization and propaganda

tion by sessions of the Central Committees. Similarly to the larger sample of elites, the 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, illustrating the importance of personal ties in Chinese politics. Conditioning on entering the Central Committee, around 20 percent of them are promoted into higher level in the four levels of the Central Committee, and around 50 percent will retire in next CC session. In terms of factional affiliation, CYLC, Shanghai Gang, and princelings each account for around 5 percent to 10 percent of members. The military has experienced a large downward trend, dropping from 56 percent in the 8th Central Committee to less than 20 percent in recent years.

4 CCP Factional Politics: Reduced Form Results

This section presents a set of facts on factional politics in China, the most important of which are novel to the best of our knowledge. These stylized facts are going to inform and motivate the theoretical analysis that follows.

i) National Political Actors. We begin by arguing qualitatively that the factional affiliations we posit (CYLC and Shanghai Gang) share properties that make them bona fide large national players within the CCP and are not merely political actors representing local constituencies.

In Figure 1 and Table 3 we describe the geographic distribution of members affiliated with the CYLC and the Shanghai Gang in provincial roles. As is evident, the representation across provinces is fairly broad and not limited to a particular local area, despite a small positive correlation between the presence of Shanghai Gang and the average GDP per capita of the province. On the other hand, individuals associated with princelings and the military group are distributed more unevenly: princelings are more likely to hold positions in rich costal areas – possibly due to their privileged status — while military members are more concentrated in poorer western provinces and places with strategic importance (e.g. Fujian, which neighbors Taiwan).

ii) Cross-Factional Mix. Useful to the understanding of factional dynamics within the CCP is the study of the peculiar factional mix which we observe when

sampling the diarchic nodes pervading Chinese institutional design. These are pairs of positions of similar rank and operating in close institutional vicinity to each other. Table 4 reports formal statistical tests of the factional composition of virtually all top two leadership posts in post-Deng China. In particular, 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.

Table 4 shows panel regressions of the factional affiliation of the number 1 official on the number 2 official's affiliation at the same node. The variables $CYLC1$ and $Shanghai1$ (respectively, $CYLC2$ and $Shanghai2$) are dummies which equal 1 if the number 1 official (respectively, number 2) is from that faction and 0 otherwise. We will also refer to such factions through the abbreviations R, B. The sample period is from 1992 to 2014. Columns 1-4 include all positions, and Columns 5-6 break down to provincial and national level positions. The provincial positions include 31 provincial and municipal units (secretary and governor)[14]. The national positions include 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).

Taking the top two leadership positions in any CCP (or PRC) organ, position 2 being filled by a R (respectively, a B) politician predicts negatively and significantly the likelihood of position 1 being filled by an R (respectively, a B) politician. The estimated negative coefficients indicate a statistically robust lower likelihood of same-faction pairs (R, R) or (B, B) relative to what would happen in case of pairings forming randomly between B, R, N. Interestingly, the evidence for princelings is much weaker, in line with further evidence below showing their lack of behavior as an organized faction. In Table 5 we further show that there is also a statistically precise excess likelihood of matching pairs in the form (R, B) and (B, R) relative to possible pairings with neutrals, N.

The presence of cross-factional pairs exceeds significantly what would emerge by random chance alone. To the best of our knowledge these facts on systematic

[14] Shanghai Municipality is excluded in the regression sample of Shanghai Gang.

cross-matching within Chinese elite politics are new. An implication of this evidence is that methodologies imputing factional affiliation based solely on shared professional paths may be highly deceptive, as discussed in the Introduction.

iii) Leadership Premia. A crucial feature of any theoretical model of factional politics is the ability of factions to deliver resources to their members. This seems a necessary condition that our factional definition should satisfy, a conceptual underpinning that we must be able to verify in the CCP data in order to justify our approach.

We will do this in what is possibly the starkest way: estimating premia in factional seat assignment and promotion rates of cofactionals of the country leader (i.e. the PRC President and General Secretary of the CCP). Again, we are not aware of any systematic analysis of this type for the CYLC and Shanghai Gang.

Table 6 shows a panel regression of promotion and retirement dummies on the factional affiliation of Central Committee members interacted with the faction of the General Secretary. The sample includes all members of the 8th to the 18th Central Committees (Politburo Standing Committee members are excluded from the promotion regression). Promotion is equal to 1 if a Central Committee member moves up in the rank defined by the four levels of Central Committee (1 PBSC, 2 PB, 3 CC, and 4 AC).

As is clear from the reduced form regressions, an R (respectively, a B) politician has substantially higher likelihood of promotion when an R (respectively, a B) leader is in power. On average CYLC and Shanghai Gang members exhibit promotion rates higher by 10 percentage points relative to neutral members (excluding military and princelings), as reported in Appendix Table 3. However, this result masks substantial heterogeneity. While promotion rates hover around 4 percentage points higher in times where the leadership is not from an individual faction, having a cofactional leader adds 20.6 percentage points to CYLC and 19.3 to Shanghai Gang, inducing a substantial, highly significant, leadership premium in the speed at which leader's cofactionals are promoted. Figure 2 provides a vivid visualization of the leadership premia in promotion rates.

We also perform an analysis looking at allocations of crucial posts to factional members. The dependent variables include: the share of official positions allocated to a faction constructed following the scheme of Bo (2010) and weighted by value (we will refer to it as "power score"); the share of seats of Alternative Central Committee members (AC); of the full Central Committee (CC); of the

Politburo members (PB); and of the Politburo Standing Committee members (PBSC). These effects are reported in Table 7. Leadership premia are statistically significant, between 4 percentage points higher in terms of power score shares for the CYLC and around 2 percentage points for the Shanghai Gang. These estimates are not trivial, but quite far from winner-take-all levels. The leadership premia in the power score can be easily observed in the simple time series plots of Figure 3.

iv) Anti-Corruption Campaign. As in the allocation of rewards to cofactionals through leadership premia, we would also expect evidence of factional bias in the administration of punishment. We have limited systematic evidence in this respect, but it interestingly points in a direction consistent with the limited leadership premia discussed at point iii).

This novel evidence comes from the factional analysis of the CCP members hit by President Xi Jinping's anti-corruption campaign (initiated in 2012 and still ongoing as of 2016). A remarkable factional balance seems to be present in the administration of punishment, when looking at the detailed resumes of the so-called "tigers", a code name for high-ranking party members affected by the purge[15]. Table 8 shows that both CYLC[16] and Shanghai Gang cadres appear represented in the purged sample[17] and, importantly, both factions are represented in shares proportional to their overall representation in the upper echelons of the CCP, and not statistically significantly higher or lower. The reader may however notice a lower, but not significant, representation of Shanghai Gang members, the faction most likely to be associated with Xi (if at all –see Section 8).

v) Post-Deng era. Finally, we provide brief empirical justification for our focus on the post-Deng era. Mao Zedong and Deng Xiaoping have been often characterized as political "strong men" by many observers, as their legendary careers in the revolutionary era won them ultimate control over the military. In

[15] As opposed to low-level politicians, "flies", involved in petty corruption. Tigers directly hit by the anti-corruption purge have included retired PBSC member Zhou Yongkang and retired PB member Xu Caiou.

[16] Links to the CYLC were evident in official news releases by The People's Daily which explicitly singled out specific subsets of this faction, particularly "The Shanxi Gang", officials linked to Ling Jihua, a disgraced protegé of Hu Jintao. http://www.bbc.com/news/blogs-china-blog-30685782

[17] We build a corruption dummy indicator for whether a political/military official is listed in the public anticorruption database of the Central Commission for Discipline Inspection and from ChinaFile. Table 8 shows the cross-section regression of corruption dummy on faction affiliation of an official. The sample includes all the individuals covered by China Vitae who have not retired in the year of 2007, the year of 17th party Congress. We dropped military personnel from the sample as the coverage of this group is relatively limited in China Vitae.

contrast, subsequent leaders, Jiang Zemin, Hu Jintao, and Xi Jinping, appear categorically different: civilian officers who rose through the party hierarchy relying on their ability and connections. This structural break is evident in the data.

Underlying the symbolic retirement of Deng in 1989, we document structural changes in the whole spectrum of political elites. Figure 4 shows the share of power score by factions or groups in the Central Committees of the CCP. Post-Deng China witnesses a significant decline in the influence of the military group, and a rise in factions such as CYLC and Shanghai Gang. Figure 5 breaks down the power score by four constituencies of the Central Committee: state organs, party apparatus, military, and regional governments. The pre-Deng era was ridden with volatile shifts across constituencies, with the most salient example being the Cultural Revolution between 1966 and 1976, during which state organs and party apparatus were virtually paralyzed. In contrast, the post-Deng era witnessed the stabilization of power shares for each constituency. Despite the lack of political reform often alleged by outside observers, the above evidence suggests that Chinese politics evolved to a new phase in which political strongmen became replaced by factional politics after Deng[18]. This is the period we focus on.

5 Model

Having produced a series of statistical regularities pointing in the direction of a systematic role for factional affiliation in the organization of the CCP (and the Chinese state more in general), we now proceed with the construction of a formal theory useful to understanding the incentive structure driving the data in the post-Deng era.

5.1 The Hierarchy of Positions

There is a L level hierarchy of leadership positions, ordered from the highest level 1, to the bottom, L. Each level, ℓ, of the hierarchy has a $M(\ell)/2$ leadership nodes. Each leadership node has a pair of leadership positions. The two positions at each node are ordered (position 1 and position 2). The hierarchy

[18] Appendix Figure 3 shows additional evidence that age limits on Politburo members are strictly and systematically enforced in the post-Deng era, again another sign of break toward institutional regularization.

is broken up into regions, each of which nests a higher number of smaller regions below it. Level 1, the top level, has one node and hence two positions; $M(1) = 2$. It is the paramount leadership node for the country as a whole (currently, President Xi Jinping and Premier Li Keqiang). Level 2, the second layer in the hierarchy, has $M(2) > M(1)$ positions divided up into $M(2)/2$, and so on, with the number of positions strictly increasing down to level L. The nodes at the lowest level are the "entry" leadership positions, corresponding to the first step in a political life that we model.

Time is continuous. Each individual politician "dies" (or exogenously retires) with an instantaneous probability, δ, which also acts as the instantaneous discount rate. Upon a politician's demise, his or her position opens up for replacement. A politician's position also opens up when promoted to a position above, freeing the current spot. We assume that the flow utility from being in office is increasing in the position within the hierarchy. Denote by $u(\ell)$ the instantaneous utility generated at any position at level ℓ, with $\ell \in \{1, \ldots, L\}$, so that $u(\ell) > u(\ell + 1)$. Positions within a level are ranked, but the utility flow difference is small. Position 1 at a node at any level ℓ is preferred to position 2, but to reduce complexity, simply refer to each as identically generating a flow of $u(\ell)$.[19]

Politicians cannot leapfrog levels of the hierarchy. An opening for either leadership position at a node in level ℓ is filled by applicants from that level, or the level immediately below, level $\ell + 1$. The only exception is positions at entry L (where there is no lower position). Though levels cannot be jumped, positions within a level can. Leaders can move from one level in the hierarchy to the next without having to progress through all the positions at their level. For example, a leader at position 2 in level $\ell + 1$ can be promoted to position 1 in level ℓ without having to first go to through the intervening positions.

All eligible leaders from lower positions can apply for openings. It costs an arbitrarily small amount to do so. So, if there is an opening at position 1 in any node of level ℓ, then all position 2 leaders in level ℓ will apply, as well as all leaders from position $\ell + 1$. If a position opens up at position 2 at a node in level ℓ, then all leaders from $\ell + 1$ will apply. The winning applicant is said to be promoted up a step in the hierarchy.

[19] Formally: position 1 generates $\epsilon \to 0^+$ extra utility relative to a position 2 at all ℓ in the same node.

5.2 Factions

There are two factions, denoted B (Blue) and R (Red), and the remaining individuals are neutrals, denoted N.[20] Factions exist to create promotion opportunities for their members and are organized in a hierarchy. A faction can support one and only one member applying for a single position. A faction member not supported by his faction for an opening cannot win promotion against a supported member.[21] For the time being, let us assume factions randomly choose whom to support amongst their eligible candidates.[22]

When a faction holds the paramount position, the effect of promotion support is enhanced, thus increasing the chances of the paramount leader's faction's candidate winning promotion vis-à-vis the other faction candidate and neutrals.

Factions write binding "contracts" with their members determining and restricting how factional support will be allocated. One can never quit a faction and the contract is a quid-pro-quo. On the way up the leadership hierarchy, the faction member will be helped in obtaining positions through the support from the faction infrastructure. If the paramount leader is from his faction, he will receive additional support. If he eventually becomes the paramount leader, the faction member will then offer the same support to the juniors that will follow him in return. This specific characterization of a faction aims at capturing in a stylized fashion the essential patron-client nature of such an organization, as strongly emphasized in Nathan (1973).

Factions are organized geographically (for the sake of exposition and, to a certain extent, realism), in a way that mimics the allocation of power positions within the country. The most senior faction member is the individual with the highest leadership position in the hierarchy. Any faction member occupying a leadership position at level ℓ is senior to a faction member at level $\ell' > \ell$. Faction members are designated by their region. A member who has a position at the top of the government is in the region of the whole country, but a member holding a position at the top of a provincial government is a member of that province and is parallel in faction seniority to a member holding a similar position in another province. This person has factional seniority over all individuals below him in

[20] The presence of more than two factions is easily incorporated. Here, we maintain this assumption only for expositional purposes and in line with the empirical analysis that follows.

[21] Or against a neutral.

[22] We will relax this assumption below when we introduce a role for meritocracy and seniority in promotions. If a faction does not support a member, he could, in principle, quit the faction and contest positions as a neutral. We do not allow this, implicitly assuming that the costs of doing this are prohibitive – factions are like the mafia: able to severely punish people who do not fulfil commitments.

the leadership hierarchy within his province. So, if a member of faction B is the provincial leader in province a, he has factional seniority over any member of faction B who is a village leader in province a. He does not have factional precedence over a village leader in province c, or any other B member who is not in a.

5.2.1 Vetoes

Factions exist to facilitate their members' rise through the leadership hierarchy. This requires having both as many members as possible and ensuring that members attain promotions. Each of these dimensions increases the probability of the faction being "powerful", i.e. attaining the paramount leadership. But given that factional support for a contested position can only be given to a single faction member, an individual may have personal incentives that run counter to his faction's objectives. For instance, a member may have an incentive to block the rise of cofactionals who could dilute his own factional support in future competitions for promotion. Factions guard against this by allowing for a seniority veto in allocating support for promotions. Support can be given if, and only if, no faction member *within the region* of the opening and senior to the candidate requesting support blocks it. Thus, when an opening arises in a region, each cofactional at equivalent or higher levels of seniority to the opening in that region can veto the provision of support. Vetoes importantly allow for individuals to block the rise of a member from the same faction who would directly compete with them for factional support in a future opening[23].

Such localized blocking of cofactional members will be very important in determining the shape of factional allocations throughout the hierarchy and the distribution of individuals across factions. The veto ensures that a faction member never has to support someone in his region from his own faction that will directly compete with him for subsequent promotions. At the same time, since the veto is regional, it does not provide so much blocking power that

[23] Vetoes can be exercised for a promotion anywhere below in the hierarchy - as long as within one's region of pertinence. However, a politician at ℓ has no interest in vetoing any co-faction member below $\ell + 1$. He can always veto them if, and when, they get to $\ell + 1$. If vetoes cost even an arbitrarily small amount, they will not be exercised for promotions up to any level lower than ℓ, else they may be wasted (a politician may be promoted to $\ell - 1$, potential rivals may retire, etc.). The single exception is where all politicians below are cofaction members. According to the model, a politician above would never let this happen and would have vetoed the rise of one of these cofactionals to avoid such a situation and ensure there is at least one individual below who can be promoted to his accompanying position not from his faction. Reassuringly, this is observed at all levels and for all periods in the data.

a high up faction member can freeze the advancement of anyone below him anywhere in the country. Providing these limited vetoes is the faction's way of balancing career incentives while lessening the costs of intra-faction rivalry, so that sufficient faction members in the hierarchy have a good chance of attaining the paramount leadership.

5.3 The State Variable

In principle, promotion probabilities at each point in time for each politician in the hierarchy will depend on their faction and the distribution of faction members across all other positions in the hierarchy. Hence, we will need to define the full distribution of positions by faction as the state variable of the system. Denote this by $\boldsymbol{S}^t$ at instant t. The state space is thus a $\sum_{\ell=1}^{L} M(\ell)\ell$ dimensional space, with each dimension taking one of three values B, R, N. The state does not change if no position opens up. However, each time an opening happens at a level ℓ, then one individual will be promoted from $\ell+1$ to ℓ to fill the open position, creating an opening at $\ell+1$ leading to one promotion from $\ell+2$, and so on, until the bottom of the hierarchy L, where a new politician enters and chooses his faction. Thus a single opening will lead to a cascade or, what we call, a "chain" of promotions. We assume that these chains occur instantaneously, and if at least one individual moving in a chain replaces an individual from a different faction, then $\boldsymbol{S}^t$ changes.

5.4 Paramount Leadership and Contests

In a competition for promotion with one member supported from each faction and one neutral politician, the probability of winning promotion, for a I faction member is given by the following contest function, $W(I)$:

$$\begin{aligned} W(I) &= \frac{i}{\beta+\rho+\eta}, \\ where\ i &= \beta,\ if\ I=B; \\ i &= \rho,\ if\ I=R; \\ i &= \eta,\ if\ I=N. \end{aligned} \tag{1}$$

$\beta, \rho,$ and η are parameters determining the strength of faction members in the contest function. Since a faction can only support a single member, the relative value of faction membership for a single politician, compared with being a

neutral, depends on both the size of these parameters and the endogenous number of eligible candidates from that faction. Additionally, having the paramount leadership position in your faction helps getting a promotion for the faction's supported candidate. If the paramount leader comes from faction B, we allow $\beta^l > \beta$, and if from faction R we allow $\rho^l > \rho$, thus incorporating leadership premia in the model.[24]

Neutrals contesting a position operate as a somewhat disorganized faction. The overall likelihood of a position going to a neutral is unaffected by the number of neutrals contesting a position, provided there is at least one. Their total contest weight function is η. This treats neutrals symmetrically to factions and can be thought of as a proportional diluting of the neutral support in the same way a faction's support would be diluted were they to forward multiple candidates instead of one.

5.4.1 Promotions and Factional Distributions

The hierarchical structure of positions within the party is taken as given and constant over time.

Promotions arise to fill openings occasioned by a death/retirement or other promotions. As already explained, a single death can have many knock-on effects. At level 1, the instantaneous probability of an opening arising at any position is δ. Since this is the highest level we observe, only death/retirement removes the top leader. However, the instantaneous probability of an opening arising at a post at level 2 comprises the death hazard δ, plus the probability that there was an opening at level 1 and the individual at that level 2 post ascended to level 1 to fill it. This probability of promotion can, in principle, depend on both the factional affiliation of the individual at the post at level 2 and the faction of the individual at the post partnering the opening at level 1. Similarly, the instantaneous probability of an opening at a post at level 3 is δ plus the probability that the individual at the post at level 3 ascended to an opening at level 2 in the hierarchy, and so on. In the estimation Section 6 that follows these knock on promotions, or promotion chains, will be explicitly computed.

Let $p_I^{J^t}(\ell)$ denote the probability that an I faction member at level ℓ gets

[24] We allow for the possibility of no factional advantage, which might be especially likely at low levels of the hierarchy where the reach of the paramount leader could be muted. Note that it is also the case that a neutral's ascension to the paramount position does not advantage neutrals down the hierarchy.

promoted to an opening paired with a J at level $\ell - 1$ at instant t, for $I, J = B, R,$ or N. Let $I^t(\ell)$ denote the number of positions held by faction I at level ℓ, at time t for $I = B, R,$ or N. By definition $M(\ell) = R^t(\ell) + B^t(\ell) + N^t(\ell)$. Since the instantaneous arrival rate of death is δ at any position, there are, in expectation, $I^t(\ell)\,\delta$ deaths arriving at a position paired with an I at level ℓ each t, and $M(\ell)\delta$ at level ℓ in general at each instant.

Let $\delta_I^t(\ell)$ denote the instantaneous arrival rate of promotions for an I politician at level ℓ. Consider first the simplest case, which is a promotion from level 2 to the top of the hierarchy $\ell = 1$. Since there are, in expectation, $I^t(1)\delta$ openings arriving for a position paired with an I due to a death, and since at level 1 there is no other way for an opening to arise, the instantaneous arrival of promotion for a I from level 2 is:[25]

$$\begin{aligned} & \delta_I^t(2) \\ = \;& R^t(1)\,\delta \times p_I^{R^t}(2) + N^t(1)\,\delta \times p_I^{N^t}(2) + B^t(1)\,\delta \times p_I^{B^t}(2). \end{aligned} \tag{2}$$

We can now similarly compute the arrival of promotions from level 3 to level 2. Intuitively, the possibility of these arises when either a leader at level 2 dies, or is himself promoted to level 1, which in turn depends on a death at level 1 as specified in equation (2). Using these, we can compute the instantaneous arrival of promotions for an I from level 3 at t as:

$$\begin{aligned} & \delta_I^t(3) \\ = \;& R^t(2)\left(\delta + \delta_R^t(2)\right) \times p_I^{R^t}(3) + N^t(2)\left(\delta + \delta_N^t(2)\right) \times p_I^{N^t}(3) \\ & + B^t(2)\left(\delta + \delta_B^t(2)\right) \times p_I^{B^t}(3). \end{aligned}$$

Similarly, continuing down the hierarchy, we have for any level $\ell > 2$:

$$\begin{aligned} & \delta_I^t(\ell) \\ = \;& R^t(\ell-1)\left(\delta + \delta_R^t(\ell-1)\right) \times p_I^{R^t}(\ell) + N^t(\ell-1)\left(\delta + \delta_N^t(\ell-1)\right) \times p_I^{N^t}(\ell) \\ & + B^t(\ell-1)\left(\delta + \delta_B^t(\ell-1)\right) \times p_I^{B^t}(\ell). \end{aligned} \tag{3}$$

(3) explicitly shows that the arrival rate of I promotions at level ℓ depends not only on the distribution at level $\ell - 1$, i.e. on $B^t(\ell-1), R^t(\ell-1), N^t(\ell-1)$,

[25] This expression uses the fact that in continuous time simultaneous hazards do not arrive. That is, we put zero weight on the probability of a death opening occurring at the same instant in two positions.

but also, through each of the $\delta_I^t(\ell-1)$, on $B^t(\ell-2), R^t(\ell-2), N^t(\ell-2)$. A convenient feature of our model specification is that higher levels of the hierarchy enter recursively, allowing the computation of arrival rates for all I factions all the way down the hierarchy.

Let us now consider the explicit form of the $p_I^{J^t}(\ell)$ using the contest function (1). We begin by assuming that the other faction $J \neq I$ will support one of its members for the position as well.

In this case $p_I^{J^t}(\ell)$ is determined as follows:

$$p_I^{J^t}(\ell) \equiv \frac{1}{I^t(\ell)} \times \begin{cases} \frac{i}{i+k+k'} & if\ K^t(\ell),\ K'^t(\ell) > 0, \\ \frac{i}{i+k} & if\ K^t(\ell) > 0,\ K'^t(\ell) = 0, \\ \frac{i}{i+k'} & if\ K^t(\ell) = 0,\ K'^t(\ell) > 0, \\ 1 & if\ K^t(\ell),\ K'^t(\ell) = 0, \end{cases} \tag{4}$$

$$\begin{aligned} where\ \{I^t, i\} &= \{B^t, \beta\}, \{R^t, \rho\}\ or\ \{N^t, \eta\}; \\ \{K^t, k\} &\neq \{I^t, i\}, \{K'^t, k'\}; \\ \{K'^t, k'\} &\neq \{I^t, i\}. \end{aligned}$$

Note that J (the faction of the politician that the opening at level $\ell-1$ is paired with) does not enter directly into the probability of winning a promotion contest. But this is because specification (4) assumes that if members of another faction are present, one of them will always be supported in the contest for the position. As we now demonstrate, this will not always be the case, which will in fact simplify the expression above considerably:

Proposition 1 *i) A politician from faction J at level ℓ will veto the support of a cofactional member ascending to his level from $\ell+1$ at t if there are members of both $I \neq J$ and neutrals, N, at level ℓ.*

ii) If there are no members of faction I at level ℓ, a politician from faction $J \neq I$ at level ℓ will veto a member of his own faction from $\ell+1$ at t if the number of cofactional members at level ℓ is such that $J^t(\ell) < \frac{j+\eta}{i}$ where $i = \beta$, $j = \rho$ if $J^t = R$ and $i = \rho$, $j = \beta$ if $J^t = B$.

Proof. All proofs are in Appendix. ■

If both R, B types are represented at a politician's level, he will gain by vetoing the ascension of a competitor from his own faction, as this increases the probability that his faction will support him for a subsequent opening at the

level above. However, if all other factions are not already present, then he faces a trade-off. By vetoing a cofactional's promotion the party member still improves his chances of gaining factional support. But he also increases the chance that a member of a rival faction, which was not already present, gains entry to the group of competitors. This lowers the chances of him winning promotion conditional upon receiving the support of his faction. The sufficient condition in the statement of Proposition 1 ensures that the former effect dominates the latter. From now on, we proceed under the assumption that the sufficient condition for vetoes holds, so that we continue to see them throughout our observations. We will verify that this is indeed the case in the data, so we do not dwell on weaker necessary conditions for vetoes to hold further.

Following Proposition 1, vetoes generate a large amount of structure to the pattern of openings – meaning no two cofactional members will ever be paired at the same node. We have already verified in Section 4 that this is, in fact, a systematic feature of the data. Moreover, the prospects of promotion at any node depend not only on the distribution of openings immediately above, but also on the distribution of openings further up, as these determine the chances that a politician immediately above will himself be promoted. Promotion chances at all levels are affected by the full distribution of positions above. We can compute this explicitly using the recursive structure of the $\delta_I^t(\ell)$ terms and our results on vetoes.

Proposition 2 *The instantaneous arrival rate of promotions at each level of the hierarchy is as follows.*

Let $\mathtt{I}_B^t = 1$*, iff* $B^t(\ell) > 0$ *and* $\mathtt{I}_B^t = 0$*, otherwise;* $\mathtt{I}_R^t = 1$*, iff* $R^t(\ell) > 0$ *and* $\mathtt{I}_R^t = 0$*, otherwise;* $\mathtt{I}_N^t = 1$*, iff* $N^t(\ell) > 0$ *and* $\mathtt{I}_N^t = 0$*, otherwise.*

For an N member:

$$\delta_N^t(\ell) = \frac{\eta}{N^t(\ell)} \times \left(R^t(\ell-1)\frac{\left(\delta + \delta_R^t(\ell-1)\right)}{\mathtt{I}_B^t\beta + \eta} + N(\ell-1)\frac{\left(\delta + \delta_N^t(\ell-1)\right)}{\mathtt{I}_B^t\beta + \mathtt{I}_R^t\rho + \eta} + B(\ell-1)\frac{\left(\delta + \delta_B^t(\ell-1)\right)}{\mathtt{I}_R^t\rho + \eta} \right).$$

For a B member:

$$\delta_B^t(\ell) = \frac{\beta}{B^t(\ell)} \times \left(R^t(\ell-1)\frac{\left(\delta + \delta_R^t(\ell-1)\right)}{\beta + \mathtt{I}_N^t\eta} + N^t(\ell-1)\frac{\left(\delta + \delta_N^t(\ell-1)\right)}{\beta + \mathtt{I}_R^t\rho + \mathtt{I}_N^t\eta} \right).$$

For an R member:

$$\delta_R^t(\ell) = \frac{\rho}{R^t(\ell)} \times \left(B^t(\ell-1)\frac{\left(\delta + \delta_B^t(\ell-1)\right)}{\rho + \mathtt{I}_N^t\eta} + N^t(\ell-1)\frac{\left(\delta + \delta_N^t(\ell-1)\right)}{\mathtt{I}_B^t\beta + \rho + \mathtt{I}_N^t\eta} \right).$$

For each one of these expressions we can see the negative dependence on the prevalence of one's own faction members. Take for example the last expression for R. The greater the number of other R's at level ℓ at t, the more diluted is an R's support (i.e. the lower the probability that any given R member will be chosen by the faction as the one to be supported), as per $R^t(\ell)$ in the denominator. Further, the more frequent the R's at level $\ell - 1$ the harder it is to get an opening for which an R at ℓ will not be vetoed (e.g. at the extreme if $R^t(\ell-1) = M^t(\ell-1)$, then $\delta_R^t(\ell) = 0$). This is true for all levels of the hierarchy from the recursion of these equations.

The proposition highlights the possible down side of factional affiliation. Though factions have the potential to provide support for promotions such support is decided by cofaction members sitting above one in the hierarchy. They will never let a junior member contest with them for their own future promotions so, in a sense, the rise of the junior is tethered to, and thus depends upon, the rise of the cofactional seniors. If they do not rise then not only do they not generate the extra support that comes from the paramount leadership, they actively block their own juniors from ascending in their place.

Finally, note that each statement of δ_I^t in Proposition 2 ignores the effect of a faction's holding of the paramount leadership on promotion (i.e. i^l). Effectively δ_I^t is written for the case of an N in paramount leadership. In the Appendix we state the full set of δ_I^t conditional upon paramount leadership affiliation.

5.5 Entry

Entry into the hierarchy of political positions occurs only at the lowest level, L. An entering politician at instant t decides which faction to join when starting his politician career, or to contest as a neutral, and bases this decision on the discounted expected utility he will receive via each one of the options. He maximizes his discounted expected utility stream:

$$V^t = \int_t^\infty e^{-\delta s} v^s ds$$

where v^t is the instantaneous utility at t. We formally consider this decision here. Recall that $u(\ell)$ denotes the politician per instant payoff to holding a position at level $\ell \in \{1, L\}$ in the hierarchy. So that if a politician holds a position at ℓ at instant t then $v^t = u(\ell)$. Define the corresponding value function for a politician of type $I = B, R, N$ at level ℓ at instant t by, $V_I^t(\ell)$. This is related to the promotion probabilities, $\delta_I^t(\ell)$, via the Bellman equation:

$$\delta \mathbb{E}^t V_I^t(\ell) = u(\ell) + \delta_I^t(\ell) \mathbb{E}^t \left[V_I^t(\ell - 1) - V_I^t(\ell) \right] \tag{5}$$

The expectations operator appears in the expression because the value of being a type I politician at ℓ depends on the instantaneous probability of being promoted to level $V_I^t(\ell - 1)$. Though this is known at instant t, via $\delta_I^t(\ell)$, the value of being at this higher level in turn depends on the evolution of $\delta_I^t(\ell)$. The evolution of these $\delta_I^t(\ell)$ promotion probabilities themselves depend on the state of the system, $\boldsymbol{S}^t$, which is changing continuously in a stochastic manner due to deaths, openings, and promotions occurring through time via the contest function (1).

The entering politician at t chooses the faction with the highest expected utility stream:

$$\sup_{I \in \{B,R,N\}} \left\{ \mathbb{E}^t V_B^t(L), \mathbb{E}^t V_R^t(L), \mathbb{E}^t V_N^t(L) \right\}. \tag{6}$$

After entry, since a politician is fixed in his faction from then on, his choices are simple. He will apply for all promotions to which he is eligible, and he will veto according to Proposition 1. We consider the more difficult problem of the initial entry decision (6) now.

5.6 Equilibrium Behavior

Entering politicians will choose to enter the faction (or remain neutral) yielding the highest expected utility, which implies choosing the faction guaranteeing the fastest progression through the hierarchy in expectation. The most immediately relevant information for the agent will be the arrival of promotions if he/she registers as a I politician from level L to $L-1$, but one cannot specify, a priori, the relative weight an entering politician puts on the chances of being promoted at higher levels of the hierarchy compared to lower levels. Perhaps politicians care little about regional promotions, that occur early in their career, but greatly about promotions from the province to the central government. Conversely,

politicians may put substantial value on their immediate entry prospects. Note that, indirectly at least, the relative performance of factions at higher levels already enters into a politician's evaluation of promotion at the lowest level, L, since openings immediately above depend negatively on the frequency of cofactional politicians all the way up the hierarchy; as discussed above after proposition 2. At any point in time this valuation will depend on the full distribution of positions higher than the politician, that is on $\boldsymbol{S}^t$, the high-dimensionality state space of the system. Without mapping the full form of expected hierarchy evolution, it is not possible to compute the value function $V_I^t(\ell)$ analytically. However, it is possible to establish a sufficient condition under which optimal entry ensures that along any time path all factional types and neutrals will be observed in equilibrium:

Proposition 3 *With $M(\ell)$ large enough for all ℓ, any equilibrium necessarily involves politicians in factions B, R, and N.*

Intuitively, with sufficiently many openings at all levels of the hierarchy, the value of entering via a faction (or as a neutral) that is not already present will eventually outweigh even the largest parametric disadvantages of that faction (or being a neutral). That is, for example, even if $\beta \ll \rho$ (so ceteris paribus it is better to enter as an R than a B), if there are sufficiently many positions in the hierarchy, a large number of R members and proposition 1 will imply that the expected promotion rate will be faster if entering as a (rare) B member over entering as (one of the many) R. Thus, though we are not able to fully characterize optimal entry in an equilibrium, the sufficient condition of the proposition ensures that *any* equilibrium distribution of positions that we do observe will feature both factions and neutrals.

5.7 From Model to Data

Openings in the hierarchy occur at any point in time via the functions in Proposition 2. Other than through the effect of time on the changing distribution of factions across the hierarchy $\mathbf{S}^t$, which the model explicitly accounts for, the process leading to openings occurs independently of time (conditional on $\mathbf{S}^t$)[26].

Treating openings this way amounts to assuming that openings are independent events caused by exogenous factors, each triggering a chain of knock on effects. This assumption may be violated at the time of Chinese Communist

[26] In what follows below we will dispense with the time index t for the empirical analysis.

Party Congresses, when there appear to be a large number of shuffles at different levels of the hierarchy observed in a way that appears simultaneous, not sequential. Indeed, for the most part, the data is observed at low frequency, i.e. at each CCP Congress $T, T+1, ...$ This implies that the promotion chains that our model postulates are not fully observable, so simulation methods will be necessary to link two subsequent $\mathbf{S}^T$,$\mathbf{S}^{T+1}$.

To operationalize the model in our specific empirical setting, we will assume that the simultaneity observed in exits and promotions reflects a particular structure, as follows.

First, we purge all individuals from all positions that we observe leaving the data in between snapshots $T, T+1, ...$ That is, all individuals who are no longer present between times T and $T+1$ are assumed to have retired at some point between two Congresses.

Second, openings are filled through a sequence of promotion chains. Each chain starts with the highest ranked exit in the sample and selects politicians to fill in the knock-on openings sequentially. This continues until all the exits and promotions between $\mathbf{S}^T$ and $\mathbf{S}^{T+1}$ are accounted for and all positions have been filled. Because there are many sets of promotion chains that can rationalize the observed openings in the data, Section 6 shows how simulation methods can be used to transparently address this issue in practice.

Third, for positions for which there is no explicit dyadic structure in the data, we draw at random a paired politician from the set of potential matches at the level at which the promotion occurs.

5.8 Discussion of the Model

Before moving to the estimation of the model, we offer here a brief discussion of an alternative modeling choice and justify our specific line of reasoning empirically.

Perhaps the best alternative to our individual career concerns model is a model that views the allocation of positions as the outcome of factional bargaining. In such a model the faction, as opposed to the individual politician, is the decision maker, and factions negotiate with each other over the allocation of positions in the hierarchy. Negotiations would favour the faction holding the paramount leadership position, and could thus easily exhibit the patterns of increased representation at all levels with leadership of a faction. The relative overall balancing could also be supported as an equilibrium outcome that en-

sures peace. If a leader comes from faction B he is not willing to completely expropriate faction R because he fears dissent from R. Dissent in extreme cases could take the form of revolt that would destabilize not just his own position but, in the limit, the overall hold of the party. So positions could be still allocated to the other faction, as a price for peace. Reciprocally, the other faction might show similar restraint if it ascended to the paramount position. Anticipating this, the current leader would have further incentives to be moderate and inclusive in allocating positions.

Problems arise for this alternative story when the actual distribution of positions — and not just their overall number — is scrutinized further, as done in Section 4. We saw that a pronounced pattern in the data was the omission of (B, B) and (R, R) pairs at leadership nodes. R members are more likely to be accompanied by B members than by N members and much less likely to be accompanied by another R — which is extremely rare. Why? One explanation consistent with factional negotiations is that each faction fears that the other faction may gain control of the node. If a B is in place, placing an R alongside him ensures that the B members do not gain permanent control of the node. But this sort of concern does not seem likely as there does not appear to be evidence of such permanent nodal control in the data. We observe shuffling of cadres occurring regularly for Provinces for instance. There does not seem to be lock in of factions to posts. B members are replaced by R members at a node with the R subsequently replaced by another B. This evidence is available upon request.

But shuffling could itself be the strategy that factions employ to ensure that control does not get held too strongly. We may see B members replaced by R members in order to ensure that the B members do not hold the position at the node too strongly. But if this is the case, a further puzzle arises. A process of shuffling — though able to easily explain (B, R) nodes — would not especially favour these. We should also regularly see (B, B) nodes and (R, R) nodes, which are then replaced by (R, R) and (B, B) nodes immediately after. If shuffling is used to avoid entrenchment, then there is no reason that intertemporal sharing of the nodes should not be sufficient to achieve this. There should be no particular reason to see the proliferation of (B, R) nodes that we observe in the data.

This seems to be the single most difficult fact to explain with a factional balancing model. Our individual career-concerns model explains this directly. In our view, the model we develop has a further advantage relative to a model that treats the factions as bargaining parties in that it treats the decision maker

as the individual, in a microfounded way.

6 Maximum Simulated Likelihood Estimation

This Section describes our estimation methodology. Define Y the observed data on career outcomes (i.e. promotions, exits, etc.) between two Congresses T and $T+1$ and X the observed data on the hierarchy plus a set of individual characteristics (i.e. X includes factions and position within the hierarchy/level $\mathbf{S}^T$, plus individual covariates).

We define $\mathtt{k}$ as a set of promotion chains, so that $\mathtt{k} = \{\mathtt{k}(1), \mathtt{k}(2), ...\}$, where each chain $\mathtt{k}(c)$ of politicians (say, s^0, s, s',and s'') is simply a set of politicians each belonging to different, but adjacent hierarchical levels ℓ, whose promotions were triggered by the exit of the highest ranking one of the chain (e.g. when s^0 dies or retires, s is promoted from $\ell = 2$ to $\ell = 1$, then s' replaces s at level $\ell = 2$, and then s'' replaces s' at $\ell = 3$).

A chain starts from an opening at level $\ell - 1$ and involves promotions from ℓ all the way down to L.[27]

We impose that each politician promoted in the data belongs to exactly one chain and that each change between $\mathbf{S}^T$ and $\mathbf{S}^{T+1}$ is part of at least one chain $\mathtt{k}(c)$. (A politician promoted by two levels between T and $T+1$ will need to belong to two separate promotion chains.) Let $C = \#(\mathtt{k})$ be the number of promotion chains in set $\mathtt{k}$.

The unconditional likelihood of observing Y given X is:

$$f(Y|X) = \mathbb{E}_{\mathtt{k}}\left[f(Y|X, \mathtt{k})\right].$$

Define $Y_{\mathtt{k}(c)}$ as the set of career outcomes pertinent to the individuals involved in promotion chain number c of $\mathtt{k}$. Because the structure of the political hierarchy will change once a promotion chain is realized, i.e. the interim $\mathbf{S}$ will change, positions within the hierarchy/level and factional affiliations at all levels $X_{\mathtt{k}(c)}$ need to be modified after each chain $\mathtt{k}(c)$ is realized.

The conditional likelihood upon the realization of a set of promotion chains $\mathtt{k}$ happening over time is given by:

[27] Plus a new entry at the lowest level, which we do not model, as per our discussion of Proposition 3. The entry choice is not necessary for estimation and all parameters are identified without its addition.

$$f(Y|X,\mathtt{k}) = \prod_{c=1}^{C} f(Y_{\mathtt{k}(c)}|X_{\mathtt{k}(c)},\mathtt{k}).$$

The likelihood contribution $f(Y_{\mathtt{k}(c)}|X_{\mathtt{k}(c)},\mathtt{k})$ of a chain $\mathtt{k}(c)$ of promotions initiated at $\ell-1$ involves computing the promotion probabilities of all individuals involved in $\mathtt{k}(c)$ at the various levels, down to L. A promotion from level ℓ to level $\ell-1$ to be paired to a politician $K = R, B, N$ is a random event distributed over a discrete support formed of $M(\ell)$ points (individual politicians), $B(\ell)$ of which occurring with probability $p_B^K(\ell)$, $R(\ell)$ occurring with probability $p_R^K(\ell)$, and $N(\ell)$ occurring with probability $p_N^K(\ell)$. (We omit time indexes as they are unnecessary here.)

Given the independence of the promotion events across levels, the construction of this likelihood is straightforward. Let I^ℓ be the faction of the individual belonging to $\mathtt{k}(c)$ at level ℓ and $J^{\ell-1}$ be the faction of the individual with which s/he is paired when promoted to level $\ell-1$:

$$f(Y_{\mathtt{k}(c)}|X_{\mathtt{k}(c)},\mathtt{k}) = \delta \prod_{l=\ell}^{L} p_{I^l}^{J^{l-1}}(l).$$

Going back to the example above of a chain of politicians s^0, s, s',and s'' belonging to factions N, R, and B respectively, and assuming they all happen to get paired with N-type politicians, the likelihood contribution of this chain is:

$$f(Y_{\mathtt{k}(c)}|X_{\mathtt{k}(c)},\mathtt{k}) = \delta \times p_N^N(2) \times p_R^N(3) \times p_B^N(4)$$

where each probability $p_{I^\ell}^{J^{\ell-1}}(\ell)$ is computed based on $X_{\mathtt{k}(c)}$, ordered from the top promotion to the level L promotion, as imposed by the sequential nature of the promotions comprised in each chain.

The Maximum Simulated Likelihood (MSL), for given number of simulated sets of promotion chains R_K,[28] is:

$$f(Y|X) = \frac{1}{R_K}\sum_{r=1}^{R_K}\prod_{c=1}^{C} f(Y_{\mathtt{k}_r(c)}|X_{\mathtt{k}_r(c)},\mathtt{k}_r).$$

This is the estimator that we employ.

[28] We employ 100 simulated chains sets for each CCP National Party Congress.

7 CCP Factional Politics: Structural Results

This section presents MSL estimates of the model and sample fit assessments. The sample includes all the members of the 14th-18th Central Committees in the post-Deng era. The simulation procedure in Section 6 was first implemented in a series of Montecarlo simulations and successfully probed for: i) identification of the structural parameters; ii) sensitivity to misspecification in the number of factions; and iii) sensitivity to misspecification in the contest function we use[29].

We begin our analysis with the most parametrically parsimonious model possible, one where we normalize $\eta = 1$ and the two faction parameters $\{\beta, \rho\}$ are estimated on top of a single leadership premium λ, defined as $\lambda = \beta^l/\beta = \rho^l/\rho$. The MSL results for this model are reported in Column 1 of Table 9. The estimated contest function parameters are 0.045 and 0.029 for CYLC and Shanghai Gang respectively, which are close to the average share of seats in the Central Committee. The estimated leadership premium λ is 2.553, implying that a faction candidate is more than twice as likely to be promoted when the paramount leader is from the same faction. The magnitude of the leadership premium is consistent with the reduced form evidence in Table 6. All parameters driving the promotion process across factions are precisely estimated.

Because it may seem restrictive to assume a common contest function across all levels of the CCP top echelons (which include heterogeneous layers in both size and jurisdiction, such as the top CCP positions and the PBSC, PB, CC, AC), Column 2 in Table 9 allows for level-specific parameters $\{\beta_k, \rho_k\}_{k=H,L}$ for the PB and higher versus CC and lower. The parameter estimates show that faction affiliation helps significantly more at higher levels than that at lower levels within the CCP: the estimated contest function parameters reach 0.162 and 0.193 at the PB and higher for CYLC and Shanghai Gang relative to CC and AC levels of 0.041 and 0.022.

One may also wonder whether the leadership premium differs across factions. Column 3 explores this possibility by allowing for faction-specific leadership premia $\{\lambda_R, \lambda_B\}$. The parameter estimates show that two factions have very similar premia (both are between 2 and 3). The improvement of log-likelihood is negligible, indicating that the two factions operate in a similar fashion. This result is also consistent with the reduced-form evidence in Table 6.

Column 4 in Table 9 combines both level-specific parameters $\{\beta_k, \rho_k\}_{k=H,L}$ and faction-specific leadership premia $\{\lambda_R, \lambda_B\}$. We conduct Likelihood Ratio

[29] All simulation results are available upon request.

(LR) tests for model 1, 2 and 3 against model 4 (numbering indicates the Column of reference). LR tests reject model 1 and 3, which impose a constant contest function across levels, against model 4, but do not reject model 2, which imposes a constant leadership premium across factions. In the following analysis, we will thus use the more parsimonious model 2 as our benchmark and refer to it as the baseline faction model.

Figure 6 provides a visual representation of the factions' seat shares by level as predicted by the model. The five bars represent the five levels of the Central Committee (the top two CCP positions, PBSC, PB, CC, and AC). The blue, white, and red parts represent the seat shares of the Shanghai Gang, Neutral, and CYLC respectively. The left panel is the data, while the right are the predictions of our baseline faction model. Our baseline faction model successfully replicates the distribution of factions across different levels of the hierarchy: faction members are relatively scarce in the lower levels, but become increasingly concentrated in the higher ones. This is related to the increasing contest function parameters estimated above, which imply an increasing advantage of factional affiliation as one progresses up the hierarchy. Notice that our model also captures the inertia of the factional composition of the various levels over time evident in the data thanks to the slow percolation of factional members up the hierarchy. The intuition is that promotions and retirements occur gradually over time. It takes time for a faction leader to grow his inner circle from the bottom of the hierarchy up. Interestingly, such dynamics can function as checks and balances on an incoming paramount leader. When a new leader first assumes power, he is likely to be surrounded by members from rival factions. There is also anecdotal evidence in line with this finding: Jiang himself once described his first few years as the General Secretary "*as standing on the brink of a deep ravine, or walking on thin ice*"[30]. Bo (2004) also suggests that the Shanghai Gang continued to exert strong influence in the first term of Hu Jintao. This finding will be particularly useful in understanding the upcoming (in the Fall of 2017) second term of Xi, expected by many observers to gain greater clout relative to his first term in office.

Our faction model also provides insights for the dynamics of power transition between factions. Figure 7 plots the aggregate share of promotions of each faction over time[31]. The share of promotions is defined as the ratio between the number of promotions for a faction and the total number of promotions. Again,

[30] See Kuhn (2005).

[31] A more detailed breakdown by level of the Central Committee can be found in Table 11.

the fit of the model is good. Figure 7 points also to a more subtle implication of our model: there are no discontinuous drops in the share of promotions of the paramount leader's faction right after he retires. When Jiang Zemin retired after the 15th Party Congress, a large share of the Shanghai Gang continued to be promoted to the 16th Central Committee. The pattern was repeated at Hu Jintao's transition to Xi Jinping at the 18th Party Congress. In reality there is uncertainty over the precise point at which the influence of the incoming paramount leader eclipses that of the departing incumbent and this influences promotion rates. Scholars have suggested that Deng retained considerable influence well after formal retirement in 1989; Jiang maintained informal and formal military oversight after stepping down as General Secretary. A retiring paramount leader may continue to shape the composition of the next Central Committee. Such intricate dynamics are captured by our simulation approach that draws different paramount leader transition dates across multiple simulations, smoothing out sharp discontinuities around the official power transition date.

7.1 Adding Individual Covariates

So far we have assumed that faction members are selected to challenge a post randomly within a faction and level; modulo vetoes of course. We can easily add individual characteristics, Z, to the within-faction selection process as well. Consider each row of the matrix Z_s to be a vector of characteristics for politician s. Define $q_{I,s}(\ell)$ as the probability that s of faction I is selected as the candidate of this faction at level ℓ, also define $\mathcal{A}_I(\ell)$ as the set of the members of faction I at level ℓ. We assume a within-faction selection probability of the logistic form[32]:

$$q_{I,s}(\ell) \equiv \frac{\exp(\gamma Z_s)}{\sum_{s' \in \mathcal{A}_I(\ell)} \exp(\gamma Z_{s'})}.$$

Therefore, the probability of winning promotion can be rewritten as $q_{I,s}(\ell) \times W(I)$. Notice that our baseline faction model is nested in this formula by setting coefficients of individual characteristics, γ, to 0. In this case we get back our random within-faction selection probability, $q_{I,s}(\ell) \equiv \frac{1}{I(\ell)}$. We refer to the

[32] Since our data only includes the top 5 levels of the party hierarchy (President/Premier, PBSC, PB, CC, AC), individual characteristics of the potential candidates eligible for promotion to AC are not always observable to us. As a result, we assume within-faction selection is random below the AC level.

above model as the faction model with individual characteristics.

The parameter estimates are reported in the Column 2 of Table 10. Comparing with the baseline faction model in Column 1, we see a reasonable improvement in model fit measured by log-likelihood. At the same time, however, we observe little change in the estimates of the parameters for the contest function and the leadership premium, suggesting that these parameters are indeed more related to the technology of factions than to individual covariates omitted in the baseline model. Examining the estimated coefficients of individual characteristics, we find that being a princeling or a male increases the probability of promotion, while having a graduate degree or being an ethnic minority hurts. The effect of age is non-linear: it has a positive effect at first, but eventually negatively affects promotion chances, in line with previously observed hard age limits enforced within the CCP.

7.2 Alternative Models

Given our main specifications, we are equipped for both in-sample and out-of-sample fit analysis of our structural model. It is useful in this respect also to present some alternative benchmarks to which we can compare our model's performance. First, we can use as the simplest alternative a model based on random promotion. This is done by setting:

$$p(\ell) \equiv \frac{1}{M(\ell)}.$$

Second, we implement a pure seniority-based promotion mechanism, setting for politician s:

$$p_s(\ell) \equiv \frac{\varphi(age_s)}{M(\ell)},$$

with $\varphi(.)$ a (third order) polynomial in age[33].

Figure 8 provides the scatter plots of model predicted shares of promotions by Party Congress and by level of the CCP against the data[34]. Our models (baseline faction and faction with individual characteristics) handily outperform both the random and the seniority models: the predicted shares by the faction models line up with the data nicely along the 45 degree line, whereas the shares predicted by random and pure seniority-based promotion models appear

[33] For the seniority and random model, we calibrate the probability of entering AC using the average share of each faction in the Central Committee.

[34] We combine level 1, 2 and 3 because there are two few observations in the first two levels.

completely flat. This result is independent of which Party Congress we consider. More concretely, with only five structural parameters our baseline faction model reduces the mean squared errors of the predicted shares of promotion by more than 80 percent comparing to the random model, and more than 70 comparing to the seniority model. The right panel of Table 10 conducts formal specification tests. The Vuong statistics reject the random and the pure seniority-based promotion models against the faction model with individual characteristics[35].

What about political meritocracy? Because the CCP promotion model is by many referred to as a strictly meritocratic mechanism (Li and Zhou, 2005; Bell, 2015) and there is substantial debate as to whether systematic assessment of cadres based on economic performance plays a role in the CCP, we test our model against this third "purely meritocratic" mechanism. First, in order to find a suitable measure of performance, we need to restrict our analysis of promotions to provincial leaders in the Central Committee. We associate these prominent provincial CCP cadres with the economic performance (in terms of real GDP growth over their tenure) of their Province of service –precisely as in Li and Zhou (2005) and Jia et al. (2015)– and use this as a (admittedly rough) proxy for overall performance. Graphical evidence of the performance of our model is reported in Figure 9[36]. In the appropriate subset of promotions (i.e. those for which performance metrics are available), our model performs better than the purely meritocratic model in terms of sum of mean squared errors, which is reduced by 35 percent.

We further examine the out-of-sample fit of our model. Specifically, we re-estimate the model using only the 14th-17th Central Committees and predict the shares of promotion of each faction at 18th Central Committee. We compare the model predicted share of promotion with the actual data in the scatter plot in Figure 10. Our faction model again outperforms random and seniority-based models in terms of out-of-sample fit. The reduction in mean squared errors is 77 percent and 69 percent comparing our baseline faction model to the random model and seniority model respectively, reassuring us of its robustness.

[35] The pure seniority-based model outperforms the baseline faction model in terms of log-likelihood. However, this is driven by the fact that only 10% of the politicians have factional affiliation. After we include individual characteristics in the factional model, the pure seniority-based model is easily rejected by the Vuong test.

[36] In this scatter plot, we do not break down the share of promotion by level because of the small number of observations in the subset of provincial leaders.

8 Counterfactuals and Model Analysis

Within our econometric framework we can explore a set of counterfactual exercises and present an additional quantitative analysis of several questions relevant to the study of Chinese political economy.

8.1 Forgoing Collective Leadership

We begin by exploring an historical counterfactual on leadership premia in the post-Deng era. Our model explicitly recognizes such premia, but a wealth of anecdotal discussion in Chinese politics (and the empirical evidence of Section 4) suggests them to have been curtailed in the post-Deng era. This peculiarity of the post-Deng Chinese system, 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[37] and the paramount leadership of Deng Xiaoping (Tsou, 1995; Fewsmith, 2001; Shambaugh, 2008). This exercise is also useful in perspective of the current changes as 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*".

Here, we will ramp up the limited role played by leadership premia in factional representation in China and present a counterfactual of what would have happened under heightened winner-take-all type factional competition. We run the model with twice as high a leadership premium λ.

Results are reported in Figure 11. A more detailed breakdown by level can be found in the third panel of Table 11. The counterfactual is implemented by simulating for each Congress T the share of promotion of each faction to the following Congress $T+1$. Under the Jiang Zemin (Shanghai Gang) presidency, openings in the Politburo and the Central Committee are filled with more of the top leader's cofactionals. Under the CYLC leadership of Hu Jintao, numbers would have been comparable, swinging in the opposite direction with more *tuanpai* members promoted. The magnitude of the increase in the shares of promotions, however, is less than the increase in the leadership premium. The dampening effect emerges from the factional veto mechanism detailed in

[37] "*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)

Proposition 1. As members of a faction become crowded at a certain level ℓ, new promotions from the same faction are more likely to be blocked by their cofactionals out of their own career concerns. Indeed, as shown in Table 11, the dampening effect is stronger in higher levels of the hierarchy where faction members are more concentrated (Figure 6). Therefore, individual incentives in intra-faction competition surprisingly limit the ability of a paramount leader to grow his own faction.

8.2 Li Keqiang Presidency

A second counterfactual we perform involves the choice of leadership ratified by the 2012 18th Party Congress. This is the event that brought Xi Jinping to the PRC Presidency. Nathan and Gilley (2003) present compelling documentary evidence that already ten years before the formal power transition Xi Jinping and Li Keqiang belonged to a select few with potential accreditation to the paramount post. Bo Xilai was also part of this highly selected group.

It is possible for us to study a counterfactual Li presidency. Figure 12 reports the aggregate share of promotion, and a more detailed breakdown by level can be found in the fourth panel of Table 11. Interestingly, given the estimated leadership premia, the promotion at PB level would have had a very limited increase in CYLC representation (Li's faction). More radical shifts would have been recorded in the promotion at the CC and AC though. Again this is a result of the slow percolation of factional representation induced by our model, compounded with the already high CYLC representation at the upper levels of the CCP at the end of Hu's last term in office.

8.3 Are Princelings a Faction?

The reader will notice that the analysis above posits factional affiliation of president Xi Jinping as a member of Shanghai Gang. This is in itself a matter of debate among scholars interested in Chinese elite politics. For instance, Li (2013) in his bi-factional representation of the Chinese top tiers defines Xi as a princeling associated with Jiang's camp (Shanghai Gang). In fact, Xi spent only seven months in any official role in Shanghai, but Jiang's substantial influence on Xi has been noted by many. Other researchers have pointed to President Xi as the leader of a new faction of his own, mostly with roots in Shaanxi, where Xi was born, and in Zhejiang Province, where he served as Party Secretary from

2002 to 2007[38]. Our model allows a formal statistical analysis of some of these questions.

We begin by investigating whether our postulate of the princelings not behaving as a unified faction is warranted by the data. To assess this formally we implement Vuong specification tests between our baseline model and one where princeling status is coded as membership in faction P, with a specific parameter π regulating an expanded contest function of the type (1):

$$W(P) = \frac{\pi}{\beta + \pi + \rho + \eta}.$$

We also specify a faction-specific leadership premium, $\lambda_p = \pi^l/\pi$, which regulates the differential promotion probability when the paramount leader is from the princelings (e.g. Xi in the 18th Party Congress).

Results are reported in Table 12. The Vuong test indicates that the model where princelings are considered to be neutrals is preferred over one where princelings are treated as a separate faction. More importantly, the estimated leadership premium within the model imposing princelings as a faction, λ_p, is estimated to be less than 1. This means that, as princeling Xi reached the paramount position, other princelings did not appear to enjoy a higher premium in promotions. This finding prima facie violates one of the crucial features of factional politics – delivering resources 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 $\lambda > 1$. In brief, the evidence rejects the hypothesis that princelings operate as a unified faction.

8.4 Is President Xi Jinping Affiliated to the Shanghai Gang?

Our structural approach allows also to produce formal tests for the analysis of factional affiliation of the top leadership. The case of Xi Jinping is emblematic because of both his strong ties to the CCP elite through family connections and

[38] Some recurring affiliated politicians include current PBSC member and anti-corruption czar Wang Qishan, and potential PBSC future members such as Li Zhanshu, director of the CC General Office, and Politburo member Zhao Leji. Shih (2016) estimates, based on shared career experience, that less than 6 percent of current CC members have past ties with President Xi. This should however not be confused with a truly factional organization of the President's inner circle for which hard evidence is not available.

his repeated rejection of intra-party factional politics (e.g. "cabals and cliques" mentioned in official transcripts on People's Daily, May 3rd, 2016[39]).

To this goal, we re-estimate the model assuming that Xi is an unaffiliated neutral, and compare the alternative model against our baseline specification where Xi is a Shanghai Gang member. The Vuong test shows that Xi is slightly more likely to be a Shanghai Gang member, although the statistical evidence is inconclusive. Our tests do not have enough power in this specific instance. Fortunately, such ambiguity is likely to be resolved after the 2017 19th Party Congress, which will unveil a wealth of data on new promotions within the CCP.

8.5 An Out-of-sample Forecast for the 2017 19th Party Congress

To conclude our quantitative exercises we employ our model to forecast the 19th Party Congress in 2017. Although admittedly speculative, to the best of our knowledge this is probably one of the very few rigorous quantitative environments allowing for exercises of this kind. The model incorporates individual characteristics in this analysis to obtain more accurate forecasts[40].

The top panel of Table 13 shows that share of promotions by level of the Central Committee. Under the assumption that Xi is in fact a Shanghai Gang member, the Shanghai faction is expected to enjoy a higher share of promotions in the Politburo than the CYLC faction due to leadership premia. In contrast, promotions at lower levels are expected to be more comparable between the two factions due to the dampening effects stemming from vetoes. Since there is still unresolved ambiguity regarding Xi's factional affiliation, we also conduct a forecast assuming Xi is a neutral in the bottom panel of Table 13. In this case, the Shanghai Gang would appear to lose its advantage in promotion for all the levels of the Central Committee.

9 Conclusions

This paper contributes to an emerging literature on the political economy of economic development by focusing on elite organization in a nondemocracy. We specifically focus on modern China and on the internal organization of the

[39] Available at http://en.people.cn/n3/2016/0503/c90000-9052676.html

[40] For individuals who newly enter AC at the 19th Party Congress whose characteristics are not readily available, we randomly draw the characteristics from the sample of the new entries of 18th Party Congress.

Chinese Communist Party. The CCP, much like historical Leninist parties in Socialist countries, represents the linchpin of national politics and understanding its inner workings is central to any political economic analysis of the PRC.

We present a model of internal organization of this single-party regime, where explicit factional dynamics within the party enrich a problem of career concerns of political cadres. The model offers a series of novel insights on the role of factions in these regimes in a fully microfounded setting. Alternative modeling choices are also discussed.

The model is validated empirically employing a rich data set on the career profiles of top CCP members. In reduced form, a set of previously unexplored systematic empirical regularities in Chinese elite politics are probed and discussed. The extent of the 2012-2016 anti-corruption purge in shaping Chinese factional politics is also analyzed. In our structural estimation, we explore important counterfactuals pertinent to the Chinese historical case and use the model to answer a series of questions relevant to the political economy of the CCP. We hope that this framework may also prove useful to the understanding of the latent institutional shifts occurring within the CCP under Xi.

In future research we hope to extend our analysis to the 2017 19th Party Congress. This will allow precision on all dimensions concerning the Xi Presidency. Besides our application to Chinese politics, we plan to focus on similarly complex nondemocratic environments –the example of Russia comes to mind– where our model of hierarchical party organization may be to a certain extent transposable.

REFERENCES

Bell, Daniel A. 2015. *The China Model: Political Meritocracy and the Limits of Democracy.* Princeton, NJ: Princeton University Press

Bai, Chong-En, Chang-Tai Hsieh, Zheng Michael Song. 2016. Crony capitalism with Chinese characteristics. *Mimeo* Chicago Booth.

Belloni, Frank P., and Beller, Dennis C. 1978. *Faction Politics: Political Parties and Factionalism in Comparative Perspective.* Santa Barbara, Clio Press.

Bo, Zhiyue. 2004. The 16th Central Committee of the Chinese Communist Party: formal institutions and factional groups. *Journal of Contemporary China*, 13(39), 233-256.

Bo, Zhiyue. 2007. *China's Elite Politics: Political Transition and Power Balancing.* Hackensack, NJ: World Scientific Publishing

Ceron, Andrea. 2015. The Politics of Fission: An Analysis of Faction Breakaways Among Italian Parties (1946-2011). *British Journal of Political Science*, 45(1), 121-39.

Chen, Ye, Hongbin Li, and Li-An Zhou. 2005. Relative Performance Evaluation and the Turnover of Provincial Leaders in China. *Economics Letters*, 88, 421-425.

Cox, Gary W.; Frances McCall Rosenbluth; Michael F. Thies. 1999. Electoral Reform and the Fate of Factions: The Case of Japan's Liberal Democratic Party. *British Journal of Political Science*, Vol. 29, No. 1. (Jan., 1999), pp. 33-56

Cox, Gary W.; Frances M. Rosenbluth; Michael F. Thies. 2000. Electoral Rules, Career Ambitions, and Party Structure: Comparing Factions in Japan's Upper and Lower Houses. *American Journal of Political Science*, Vol. 44, No. 1. (Jan., 2000), pp. 115-122

Dewan, Turun, Francesco Squintani. 2015. In Defense of Factions. American Journal of Political Science, in press.

Dittmer, Lowell. 1995. Chinese informal Politics. *The China Journal* 34: 1-34.

Dittmer, Lowell, 2004. Leadership Change and Chinese Political Development. in *The New Chinese Leadership: Challenges and opportunities after the 16th Party Congress. The China Quarterly Special Issues* No. 4 Cambridge University Press.

Fewsmith, Joseph. 2001. The New Shape of Elite Politics, *The China Journal*, 45: 83-93

Francois, Patrick, Ilia Rainer, Francesco Trebbi. 2015. How Is Power Shared in Africa?, *Econometrica*, March 2015, 83(2): pp.465-503.

Francois, Patrick, Ilia Rainer, Francesco Trebbi. 2016. The Dictator's Inner Circle, *mimeo UBC*.

Huang, Jing. 2000. *Factionalism in Chinese Communist Politics*. Cambridge University Press.

Jia, Ruixue, Masayuki Kudamatsu and David Seim. 2015. Political Selection in China: Complementary Roles of Connections and Performance. *Journal of the European Economics Association*, 13 (4): 631–668.

Kato, Junko and Carol Mershon, 2006. Internal party organization in the Italian Christian democrats and Japanese liberal democrats: factional competition for office, clienteles, and corrupt exchange. In *Comparing Political Corruption and Clientelism*, J. Kawata, ed., Ashgate Publishing Company, Burlington VT.

Kuhn, Robert Lawrence. 2005. *The Man Who Changed China: The Life and Legacy of Jiang Zemin*. Random House.

Laver, Michael, Daniela Giannetti. 2004. Party cohesion, party discipline, party factions in Italy, in Intra-party politics and coalition governments, ed. by K. Benoit, and D. Giannetti, pp. 146-168. Routledge, London.

Li, Cheng. 2002. The Shanghai Gang: Force for Stability or Cause for Conflict? *China Leadership Monitor* 2: 1-18.

Li, Cheng. 2012. The Battle for China's Top Nine Leadership Posts. *The Washington Quarterly* 35:1, 131-145

Li, Cheng. 2013. A Biographical and Factional Analysis of the Post-2012 Politburo. *China Leadership Monitor* 41: 1-17.

Li, Hongbin, and Li-An Zhou. 2005. Political Turnover and Economic Performance: the Incentive Role of Personnel Control in China. *Journal of Public Economics* 89 (9): 1743-62.

McAllister Ian. 1991. Party Adaptation and Factionalism within the Australian Party System. American Journal of Political Science, 35(3), 206-27.

Myers, Gustavus. 1917. *The History of Tammany Hall*. Boni & Liverlight, NY

Nathan, Andrew. 1973. A Factionalism Model of CCP Politics. *China Quarterly* 53 (January), 34–66.

Nathan, Andrew and Bruce Gilley. 2003. *China's New Rulers: The Secret Files.* New York, NY: The New York Review Books

Nathan, Andrew. 2016. Who Is Xi? *The New York Review of Books,* May 12th Issue.

Persico, Nicola, José C. Rodriguez-Pueblita, and Dan Silverman. 2011.Factions and Political Competition. *Journal of Political Economy*, 119 (2): 242-288.

Pye, Lucian. 1980. The Dynamics of Factions and Consensus in Chinese Politics: A Model and Some Propositions. *RAND Air Force Report.* R-2566-AF

Shambaugh, David L. 2008. *China's Communist Party: Atrophy and Adaptation.* UC Press.

Shih, Victor. 2004. Factions Matter: Personal Networks and Distribution of Bank Loans in China. *Journal of Contemporary China* 13: 3-19.

Shih, Victor. 2007. *Factions and Finance in China: Elite Conflict and Inflation.* Cambridge University Press

Shih, Victor, Christopher Adolph, and Mingxing Liu. 2012. Getting Ahead in the Communist Party: Explaining the Advancement of Central Committee Members in China. *American Political Science Review* 106 (1): 166–87

Shih, Victor. 2016. Efforts at exterminating factionalism under Xi Jinping: Will Xi Jinping dominate Chinese politics after the 19th Party Congress? *Mercator Institute for China Studies Papers*, 1 (June): 18-21.

Tsou, Tang. 1995. Chinese Politics at the Top: Factionalism or Informal Politics? Balance-of-Power Politics or a Game to Win All? *The China Journal* 34: 95–156

Zhengxu Wang, Jinghan Zeng. 2016. Xi Jinping: the game changer of Chinese elite politics? *Contemporary Politics* 1, 1-18

Zuckerman, Alan. 1975. *Political Clienteles in Power: Party Factions and Cabinet Coalitions in Italy.* Sage Professional Papers in Comparative Politics, 1-55, Beverly Hills and London: Sage Publications

10 Appendix

Proof of Proposition 1. Part (i). Suppose that, $I(\ell) > 0$, where $I \neq J$, and $N(\ell) > 0$. Consider the decision by a faction-J politician in a node at ℓ of whether to veto a cofactional's support for promotion to his node. With the promotion of a same-faction member from J to the politician's node, let $J^*(\ell)$ denote the total number of faction J members that would be present at level ℓ. Then, using equation (3) and (4), the promotion hazard parameter for this J politician at level ℓ (if the other faction K also vetoes co-faction members) if he does not veto becomes:

$$\delta_J(\ell) = \frac{j}{J^*(\ell)} \left(I(\ell-1)\frac{(\delta + \delta_I(\ell-1))}{j+\eta} + N(\ell-1)\frac{(\delta + \delta_N(\ell-1))}{j+i+\eta} \right),$$

with $j = \beta$ and $i = \rho$ or viceversa. If instead, the politician vetoes his cofactional, and a member of the other faction (or a neutral) ascends to his node, his promotion hazard becomes:

$$\delta_J(\ell) = \frac{j}{J^*(\ell)-1} \left(I(\ell-1)\frac{(\delta + \delta_I(\ell-1))}{j+\eta} + N(\ell-1)\frac{(\delta + \delta_N(\ell-1))}{j+i+\eta} \right),$$

which is strictly greater.

If the other faction does not veto its members the respective expressions become:

$$\delta_J(\ell) = \frac{j}{J^*(\ell)} \left(I(\ell-1)\frac{(\delta + \delta_I(\ell-1))}{j+i+\eta} + N(\ell-1)\frac{(\delta + \delta_N(\ell-1))}{j+i+\eta} \right)$$

and

$$\delta_J(\ell) = \frac{j}{J^*(\ell)-1} \left(I(\ell-1)\frac{(\delta + \delta_I(\ell-1))}{j+i+\eta} + N(\ell-1)\frac{(\delta + \delta_N(\ell-1))}{j+i+\eta} \right).$$

And the latter hazard is clearly higher again. This proves part a).

Part (ii). Suppose that, $I(\ell) = 0$, and $N(\ell) > 0$. Suppose further that, with the promotion of a co-faction member to J's node there will be $J^*(\ell)$ members of J's faction at level ℓ, then the hazard parameter for promotion of this J

politician is:

$$\delta_J(\ell) = \frac{j}{J^*(\ell)}\left(I(\ell-1)\frac{(\delta+\delta_I(\ell-1))}{j+\eta} + N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{j+\eta}\right). \quad (7)$$

If an N member instead ascends to his node, then the J member's promotion hazard is:

$$\delta_J(\ell) = \frac{j}{J^*(\ell)-1}\left(I(\ell-1)\frac{(\delta+\delta_I(\ell-1))}{j+\eta} + N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{j+\eta}\right),$$

which exceeds (7), so he is clearly better off vetoing his own faction member.

However, if an $I \neq J, N$ ascends to his node, then the J member's promotion hazard becomes:[41]

$$\delta_J(\ell) = \frac{j}{J^*(\ell)-1}\left(I(\ell-1)\frac{(\delta+\delta_I(\ell-1))}{j+\eta} + N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{i+j+\eta}\right). \quad (8)$$

Since this I will contest $\ell-1$ level openings (the second expression above), this lowers the chances of the J begin promoted to one of those. Assuming I factionals also veto, an I ascending to J's node lowers the chances of a J promotion the most if $N(\ell-1) = M(\ell-1)$. So a sufficient condition for J to exercise a veto assumes all higher positions are filled by members that are neutral, N. Under this assumption expression (8) becomes:

$$\delta_J(\ell) = \frac{j}{J^*(\ell)-1}\left(M(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{i+j+\eta}\right),$$

and expression (7) becomes:

$$\delta_J(\ell) = \frac{j}{J^*(\ell)}\left(M(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{j+\eta}\right).$$

So J will veto a J coming from level $\ell+1$ provided that:

$$\begin{aligned}\frac{j}{J^*(\ell)}\left(M(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{j+\eta}\right) &< \frac{j}{J^*(\ell)-1}\left(M(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{i+j+\eta}\right)\\ &\Rightarrow \frac{J^*(\ell)-1}{J^*(\ell)} < \frac{j+\eta}{i+j+\eta}\\ &\Rightarrow J(\ell) < \frac{j+\eta}{i}\end{aligned}$$

[41] Assuming that I's also veto. If they don't the sufficient condition is slightly altered, but qualitatively identical.

where we use that $J^*(\ell) - 1 = J(\ell)$. ■

Proof of Proposition 2. Let us define the indicator functions $\mathtt{I}_B = 1$, iff $B(\ell) > 0$ and $\mathtt{I}_B = 0$, otherwise; $\mathtt{I}_N = 1$, iff $N(\ell) > 0$ and $\mathtt{I}_N = 0$, otherwise; $\mathtt{I}_R = 1$, iff $R(\ell) > 0$ and $\mathtt{I}_R = 0$, otherwise.

Start with a neutral (N), who is at level ℓ in the hierarchy. $\delta_I(\ell - 1)$ is determined from the hierarchy above:

$$\begin{aligned}\delta_N(\ell) = & R(\ell-1)\left(\delta + \delta_R(\ell-1)\right) p_N^R(\ell) \\ & + N(\ell-1)\left(\delta + \delta_N(\ell-1)\right) p_N^N(\ell) \\ & + B(\ell-1)\left(\delta + \delta_B(\ell-1)\right) p_N^B(\ell).\end{aligned}$$

Consider further that, differently from (4) where $p_N^R(\ell) = \eta/(\mathtt{I}_B\beta + \eta + \mathtt{I}_R\rho)$, now $p_N^R(\ell) = \eta/(\mathtt{I}_B\beta + \eta)$ because in Proposition 1 each $R(\ell - 1)$ is proven to veto any R possibly competing against N. For a similar reason, it holds that $p_N^B(\ell) = \eta/\left(\mathtt{I}_R\rho + \eta\right)$.

We then have:

$$\begin{aligned}& \delta_N(\ell) \\ = \quad & \frac{\eta}{N(\ell)}\left(R(\ell-1)\frac{\left(\delta + \delta_R(\ell-1)\right)}{\mathtt{I}_B\beta + \eta} + N(\ell-1)\frac{\left(\delta + \delta_N(\ell-1)\right)}{\mathtt{I}_B\beta + \mathtt{I}_R\rho + \eta} + B(\ell-1)\frac{\left(\delta + \delta_B(\ell-1)\right)}{\mathtt{I}_R\rho + \eta}\right).\end{aligned}$$

Similarly, for a faction B member this is given by:

$$\begin{aligned}\delta_B(\ell) = & R(\ell-1)\left(\delta + \delta_R(\ell-1)\right) p_B^R(\ell) \\ & + N(\ell-1)\left(\delta + \delta_N(\ell-1)\right) p_B^N(\ell) \\ & + B(\ell-1)\left(\delta + \delta_B(\ell-1)\right) p_B^B(\ell) \\ & = \frac{\beta}{B(\ell)}\left(R(\ell-1)\frac{\left(\delta + \delta_R(\ell-1)\right)}{\beta + \mathtt{I}_N\eta} + N(\ell-1)\frac{\left(\delta + \delta_N(\ell-1)\right)}{\beta + \mathtt{I}_R\rho + \mathtt{I}_N\eta}\right),\end{aligned}$$

where the last line uses the fact that vetoing from Proposition 1 implies $p_B^B(\ell) = 0$, while $p_B^R(\ell) = \beta/\left(\beta + I_N\eta\right)$ and $p_B^N(\ell) = \beta/\left(\beta + \mathtt{I}_R\rho + \mathtt{I}_N\eta\right)$.

Finally, for a faction R member this is:

$$\begin{aligned}\delta_R(\ell) &= R(\ell-1)\left(\delta+\delta_R(\ell-1)\right)p_R^R(\ell)\\ &+ N(\ell-1)\left(\delta+\delta_N(\ell-1)\right)p_R^N(\ell)\\ &+ B(\ell-1)\left(\delta+\delta_B(\ell-1)\right)p_R^B(\ell)\\ &= \frac{\rho}{R(\ell)}\left(B(\ell-1)\frac{(\delta+\delta_B(\ell-1))}{\rho+\mathtt{I}_N\eta}+N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{\mathtt{I}_B\beta+\rho+\mathtt{I}_N\eta}\right),\end{aligned}$$

where the last line uses the fact that our vetoing results in Proposition 1 imply $p_R^R(\ell)=0$, while $p_R^B(\ell)=\rho/\left(\rho+\mathtt{I}_N\eta\right)$ and $p_R^N(\ell)=\rho/\left(\rho+\mathtt{I}_B\beta+\mathtt{I}_N\eta\right)$. ■

Full Listing of $\delta_I(\ell)$ conditional on paramount leadership

For an N. If an N is paramount leader:

$$\delta_N(\ell)=\frac{\eta}{N(\ell)}\left(R(\ell-1)\frac{(\delta+\delta_R(\ell-1))}{\mathtt{I}_B\beta+\eta}+N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{\mathtt{I}_B\beta+\mathtt{I}_R\rho+\eta}+B(\ell-1)\frac{(\delta+\delta_B(\ell-1))}{\mathtt{I}_R\rho+\eta}\right).$$

If an R is paramount leader:

$$\delta_N(\ell)=\frac{\eta}{N(\ell)}\left(R(\ell-1)\frac{(\delta+\delta_R(\ell-1))}{\mathtt{I}_B\beta+\eta}+N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{\mathtt{I}_B\beta+\mathtt{I}_R\rho^l+\eta}+B(\ell-1)\frac{(\delta+\delta_B(\ell-1))}{\mathtt{I}_R\rho^l+\eta}\right).$$

If a B is paramount leader:

$$\delta_N(\ell)=\frac{\eta}{N(\ell)}\left(R(\ell-1)\frac{(\delta+\delta_R(\ell-1))}{\mathtt{I}_B\beta^l+\eta}+N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{\mathtt{I}_B\beta^l+\mathtt{I}_R\rho+\eta}+B(\ell-1)\frac{(\delta+\delta_B(\ell-1))}{\mathtt{I}_R\rho+\eta}\right).$$

where $\mathtt{I}_B=1$, *iff* $B(\ell)>0$ *and* $\mathtt{I}_B=0$, *otherwise*; $\mathtt{I}_R=1$, *iff* $R(\ell)>0$ *and* $\mathtt{I}_R=0$, *otherwise.*

For faction B member. If an N is paramount leader:

$$\delta_B(\ell)=\frac{\beta}{B(\ell)}\left(R(\ell-1)\frac{(\delta+\delta_R(\ell-1))}{\beta+\mathtt{I}_N\eta}+N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{\beta+\mathtt{I}_R\rho+\mathtt{I}_N\eta}\right).$$

If an R is paramount leader:

$$\delta_B(\ell)=\frac{\beta}{B(\ell)}\left(R(\ell-1)\frac{(\delta+\delta_R(\ell-1))}{\beta+\mathtt{I}_N\eta}+N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{\beta+\mathtt{I}_R\rho^l+\mathtt{I}_N\eta}\right).$$

If a B is paramount leader:

$$\delta_B(\ell)=\frac{\beta^l}{B(\ell)}\left(R(\ell-1)\frac{(\delta+\delta_R(\ell-1))}{\beta^l+\mathtt{I}_N\eta}+N(\ell-1)\frac{(\delta+\delta_N(\ell-1))}{\beta^l+\mathtt{I}_R\rho+\mathtt{I}_N\eta}\right).$$

where $\mathtt{I}_N = 1$, *iff* $N(\ell) > 0$ *and* $\mathtt{I}_N = 0$, *otherwise*; $\mathtt{I}_R = 1$, *iff* $R(\ell) > 0$ *and* $\mathtt{I}_R = 0$, *otherwise*.

For a faction R member. If an N is paramount leader:

$$\delta_R(\ell) = \frac{\rho}{R(\ell)} \left(B(\ell-1) \frac{(\delta + \delta_B(\ell-1))}{\rho + \mathtt{I}_N \eta} + N(\ell-1) \frac{(\delta + \delta_N(\ell-1))}{\mathtt{I}_B \beta + \rho + \mathtt{I}_N \eta} \right).$$

If an R is paramount leader:

$$\delta_R(\ell) = \frac{\rho^l}{R(\ell)} \left(B(\ell-1) \frac{(\delta + \delta_B(\ell-1))}{\rho^l + \mathtt{I}_N \eta} + N(\ell-1) \frac{(\delta + \delta_N(\ell-1))}{\mathtt{I}_B \beta + \rho^l + \mathtt{I}_N \eta} \right).$$

If a B is paramount leader:

$$\delta_R(\ell) = \frac{\rho}{R(\ell)} \left(B(\ell-1) \frac{(\delta + \delta_B(\ell-1))}{\rho + \mathtt{I}_N \eta} + N(\ell-1) \frac{(\delta + \delta_N(\ell-1))}{\mathtt{I}_B \beta^l + \rho + \mathtt{I}_N \eta} \right).$$

where $\mathtt{I}_N = 1$, *iff* $N(\ell) > 0$ *and* $\mathtt{I}_N = 0$, *otherwise*; $\mathtt{I}_B = 1$, *iff* $B(\ell) > 0$ *and* $\mathtt{I}_B = 0$, *otherwise*.

■

Proof of Proposition 3. We first demonstrate that, if the system is stationary, so that $V_I^t(\ell) = V_I(\ell)$ and $\delta_I^t(\ell) = \delta_I(\ell)$ $\forall I, \ell$, then $\delta_I(\ell) > \delta_J(\ell)$ implies $V_I(\ell) > V_J(\ell)$. So, (6) is solved by the I such that $\delta_I(\ell)$ is $\sup\{\delta_B(\ell), \delta_R(\ell), \delta_N(\ell)\}$.

The stationary analog of equation (5) where $V_I^t(\ell) = V_I(\ell)$ and $\delta_I^t(\ell) = \delta_I(\ell)$ $\forall I, \ell$ is:

$$\delta V_I(\ell) = u(\ell) + \delta_I(\ell)\left[V_I(\ell-1) - V_I(\ell)\right],$$

which implies:

$$V_I(\ell) = \frac{u(\ell) + \delta_I(\ell) V_I(\ell-1)}{\delta + \delta_I(\ell)}$$

and

$$V_I(\ell-1) = \frac{u(\ell-1) + \delta_I(\ell-1) V_I(\ell-2)}{\delta + \delta_I(\ell-1)}.$$

By repeated substitution:

$$\begin{aligned} V_I(\ell) &= \frac{u(\ell)}{\delta + \delta_I(\ell)} + \\ &\quad \frac{\delta_I(\ell)\, u(\ell-1)}{(\delta + \delta_I(\ell))(\delta + \delta_I(\ell-1))} + \\ &\quad \frac{\delta_I(\ell)\, \delta_I(\ell-1)\, u(\ell-2)}{(\delta + \delta_I(\ell))(\delta + \delta_I(\ell-1))(\delta + \delta_I(\ell-2))} + \\ &\quad \ldots + \frac{\delta_I(\ell)\, \delta_I(\ell-1) \cdots \delta_I(2)\, u(1)}{(\delta + \delta_I(\ell))(\delta + \delta_I(\ell-1)) \cdots (\delta + \delta_I(1))}. \end{aligned}$$

This reduces to:

$$V_I(\ell) = \frac{u(\ell)}{\delta + \delta_I(\ell)} + \sum_{j=1}^{\ell-1} u(j) \times \frac{\prod_{k=j}^{k=\ell-1} \delta_I(k+1)}{\prod_{k=j}^{k=\ell} (\delta + \delta_I(k))}.$$

Since flow payoffs are higher the higher the politician is in the hierarchy, i.e. $u(\ell-1) > u(\ell)\ \forall \ell$, then necessarily increasing the rate of promotion improves valuations, $\frac{dV_I(\ell)}{d\delta_I(\ell)} > 0\ \forall \ell$. This implies that $\delta_I(\ell) > \delta_J(\ell)$ ensures $V_I(\ell) > V_J(\ell)$.

The proof proceeds next by establishing sufficient conditions for three parts. (i) The existence of neutrals given factions exist; (ii). The existence of a single faction given neutrals exist; (iii) The existence of a second faction, given neutrals and a first faction already exist.

In each part, a sufficient condition is provided for $\delta_I(\ell) > \delta_{J \neq I}(\ell)$ and $\delta_{K \neq I}(\ell)$ at a single level, ℓ. The sufficient condition established in each case is thus required to hold at all ℓ in order to ensure that an entering politician prefers entry as a type I.

Part (i). We establish a sufficient condition for there to be neutrals. Suppose, on the contrary, that there exist no N members. Necessarily, due to Proposition 1, without N's, all nodes will be filled by both a B and an R. Thus, under the supposition, the hierarchy remains stationary, so that, from the result above, it is sufficient to compute only the stationary $\delta_I(\ell)$ for each ℓ to determine the optimal I.

Assume, without loss of generality, that the paramount leadership position is held by a B. Consider level ℓ in the hierarchy. Necessarily the promotion

hazard for an N at level ℓ is given by:

$$\delta_N(\ell) = \eta \left(R(\ell-1) \frac{(\delta + \delta_R(\ell-1))}{\mathtt{I}_B \beta^l + \eta} + B(\ell-1) \frac{(\delta + \delta_B(\ell-1))}{\mathtt{I}_R \rho + \eta} \right).$$

Due to optimal vetoes at each node, it must be that $R(\ell-1) = B(\ell-1) = M(\ell-1)/2$ and $\mathtt{I}_B = \mathtt{I}_R = 1$. The relationship between $\delta_R(\ell-1)$ and $\delta_B(\ell-1)$ is ambiguous. So consider both cases separately. First, assume that $\delta_R(\ell-1) \leq \delta_B(\ell-1)$, which will imply, due to the symmetry of the posited hierarchy, that $\delta_R(\ell) \leq \delta_B(\ell)$ too. Then, substituting for $\mathtt{I}_B, \mathtt{I}_R$, $R(\ell-1)$ and $B(\ell-1)$ yields:

$$\delta_N(\ell) = \eta \left(M(\ell-1)/2 \times \frac{(\delta + \delta_R(\ell-1))}{\beta^l + \eta} + M(\ell-1)/2 \times \frac{(\delta + \delta_B(\ell-1))}{\rho + \eta} \right).$$

Since $\delta_R(\ell-1) \leq \delta_B(\ell-1)$ then:

$$\delta_N(\ell) \geq \eta M(\ell-1)/2 \times (\delta + \delta_R(\ell-1)) \left(\frac{1}{\beta^l + \eta} + \frac{1}{\rho + \eta} \right),$$

and assuming, for now, that $\beta^l > \rho$ implies:

$$\delta_N(\ell) \geq \eta M(\ell-1) \times (\delta + \delta_R(\ell-1)) \left(\frac{1}{\beta^l + \eta} \right). \tag{9}$$

Now consider $\delta_B(\ell)$:

$$\begin{aligned} \delta_B(\ell) &= \frac{2\beta^l}{M(\ell)} \left(M(\ell-1)/2 \times \frac{(\delta + \delta_R(\ell-1))}{\beta^l} \right) \\ &= \frac{1}{M(\ell)} \left(M(\ell-1) \times (\delta + \delta_R(\ell-1)) \right). \end{aligned}$$

Then $\delta_N(\ell) > \delta_B(\ell)$ if:

$$\eta M(\ell-1) \times (\delta + \delta_R(\ell-1)) \left(\frac{1}{\beta^L + \eta} \right) > \frac{1}{M(\ell)} \left(M(\ell-1) \left(\delta + \delta_R(\ell-1) \right) \right),$$

which rearranges to:

$$\frac{\eta}{\beta^l + \eta} > \frac{1}{M(\ell)}. \tag{10}$$

By supposition $\delta_R(\ell) \leq \delta_B(\ell)$, so this condition, which clearly holds for $M(\ell)$ large enough at all ℓ, is sufficient for neutrals to be the preferred entering type, thus contradicting the maintained assumption that neutrals are not in the hi-

erarchy. Assuming, alternatively, that $\beta^l \leq \rho$, instead of using the inequality in (9) we now have:

$$\delta_N(\ell) \geq \eta M(\ell-1) \times (\delta + \delta_R(\ell-1)) \left(\frac{1}{\rho+\eta}\right),$$

which, by following the same procedure as above, yields the analog to (10) as a sufficient condition for $\delta_N(\ell) > \delta_B(\ell)$, namely:

$$\frac{\eta}{\rho+\eta} > \frac{1}{M(\ell)}. \tag{11}$$

This again holds for sufficiently high $M(\ell)$, and again, since it continues to be the case that $\delta_R(\ell-1) \leq \delta_B(\ell-1)$, this implies that entering politicians will choose to be neutral.

Now suppose the alternative relationship between $\delta_R(\ell-1)$ and $\delta_B(\ell-1)$, that is: $\delta_R(\ell-1) > \delta_B(\ell-1)$, and again first posit that $\beta^l > \rho$. Then let us use these two inequalities and substitute for $\mathtt{I}_B, \mathtt{I}_R$, $R(\ell-1)$ and $B(\ell-1)$ exactly as we did above. Equation (9) now yields:

$$\begin{aligned}
\delta_N(\ell) &= \eta \left(M(\ell-1)/2 \times \frac{(\delta + \delta_R(\ell-1))}{\beta^l + \eta} + M(\ell-1)/2 \times \frac{(\delta + \delta_B(\ell-1))}{\rho+\eta} \right) \\
&> \eta M(\ell-1)/2 \times (\delta + \delta_B(\ell-1)) \left(\frac{1}{\beta^l+\eta} + \frac{1}{\rho+\eta} \right) \\
&> \eta M(\ell-1) \times (\delta + \delta_B(\ell-1)) \left(\frac{1}{\beta^l+\eta} \right).
\end{aligned}$$

Now $\delta_R(\ell)$ is given by:

$$\begin{aligned}
\delta_R(\ell) &= \frac{2\rho}{M(\ell)} \left(M(\ell-1)/2 \times \frac{(\delta + \delta_B(\ell-1))}{\rho} \right) \\
&= \frac{1}{M(\ell)} \left(M(\ell-1) \times (\delta + \delta_B(\ell-1)) \right).
\end{aligned}$$

Then $\delta_N(\ell) > \delta_R(\ell)$ if:

$$\eta M(\ell-1) \times (\delta + \delta_B(\ell-1)) \left(\frac{1}{\beta^L + \eta} \right) > \frac{1}{M(\ell)} \left(M(\ell-1) \left(\delta + \delta_B(\ell-1) \right) \right).$$

A sufficient condition for this is:

$$\frac{\eta}{\beta^l + \eta} > \frac{1}{M(\ell)}.$$

This again holds for $M(\ell)$ high enough. Since $\delta_R(\ell) > \delta_B(\ell)$, This implies also that $\delta_N(\ell) > \delta_B(\ell)$. The analogous procedure under the alternative assumption $\beta^l \leq \rho$ yields a sufficient condition exactly as in (11):

$$\frac{\eta}{\rho + \eta} > \frac{1}{M(\ell)}.$$

Part (ii). We now establish a sufficient condition for there to exist at least a single faction. Suppose that all positions in the hierarchy are held by a neutral. Consider an entrant choosing to also be a neutral. In that case under the supposition, the system is again stationary and we have:

$$\delta_N(\ell) = \frac{N(\ell-1)}{M(\ell)} \left(\delta + \delta_N(\ell-1)\right).$$

But by entering as a B member the entrant would have:

$$\delta_B(\ell) = \beta N(\ell-1) \left(\frac{\delta + \delta_N(\ell-1)}{\beta + \eta}\right).$$

These rearrange to imply that $\delta_B(\ell) > \delta_N(\ell)$ provided that $M(\ell) > \frac{\beta+\eta}{\beta}$. The analogous sufficient condition for an R entrant is $M(\ell) > \frac{\rho+\eta}{\rho}$. This establishes this part.

Part (iii). We establish a sufficient condition for two factions to exist. We proceed as above, by demonstrating a contradiction. If there is only one faction present, without loss of generality let it be B, and the other politicians are N, for sufficiently high $M(\ell)$, $\delta_R(\ell) > \delta_B(\ell)$ or $\delta_N(\ell)$, so that an entering politician will choose to enter as an R.

As previously, with only N and B in the hierarchy we have:

$$\delta_N(\ell) = \frac{\eta}{M(\ell) - B(\ell)} \left(N(\ell-1)\frac{(\delta + \delta_N(\ell-1))}{\beta + \eta} + B(\ell-1)\frac{(\delta + \delta_B(\ell-1))}{\eta}\right),$$

$$\delta_B(\ell) = \frac{\beta}{B(\ell)} \left(N(\ell-1)\frac{(\delta + \delta_N(\ell-1))}{\beta + \eta}\right).$$

Either $\delta_N(\ell) > \delta_B(\ell)$, so that a new entrant would prefer to enter as an N over

a B, or the converse, in which case he would choose to enter as a B over an N. Suppose first that $\delta_N(\ell) > \delta_B(\ell)$ and consider the promotion hazard for a single entering R:

$$\delta_R(\ell) = \rho \left(B(\ell-1) \frac{(\delta + \delta_B(\ell-1))}{\rho + \eta} + N(\ell-1) \frac{(\delta + \delta_N(\ell-1))}{\rho + \beta + \eta} \right).$$

If $\delta_N(\ell) > \delta_B(\ell)$ for an increase in $M(\ell)$, then necessarily the term $M(\ell) - B(\ell)$ increases with $M(\ell)$, since an extra politician would enter as an N instead of a B. But since $\delta_R(\ell)$ above is independent of $M(\ell)$, there exists an $M(\ell)$ sufficiently high so that $\delta_R(\ell) > \delta_N(\ell)$, and an entering politician would instead choose to be an R over being an N, contradicting the posited non-existence of R members in equilibrium.

Alternatively, suppose that $\delta_N(\ell) \leq \delta_B(\ell)$, then, for an increase in $M(\ell)$ necessarily the term $M(\ell) - N(\ell)$ increases with $M(\ell)$, as a politician would choose to enter as a B over being an N. Now consider the promotion hazard for a B:

$$\delta_B(\ell) = \frac{\beta}{M(\ell) - N(\ell)} \left(N(\ell-1) \frac{(\delta + \delta_N(\ell-1))}{\beta + \eta} \right).$$

Again, since $\delta_R(\ell)$ is independent of $M(\ell)$, there exists an $M(\ell)$ high enough so that $\delta_R(\ell) > \delta_B(\ell)$, which implies that a new entrant will choose to enter as an R member, again contradicting the posited non-existence of R members. ■

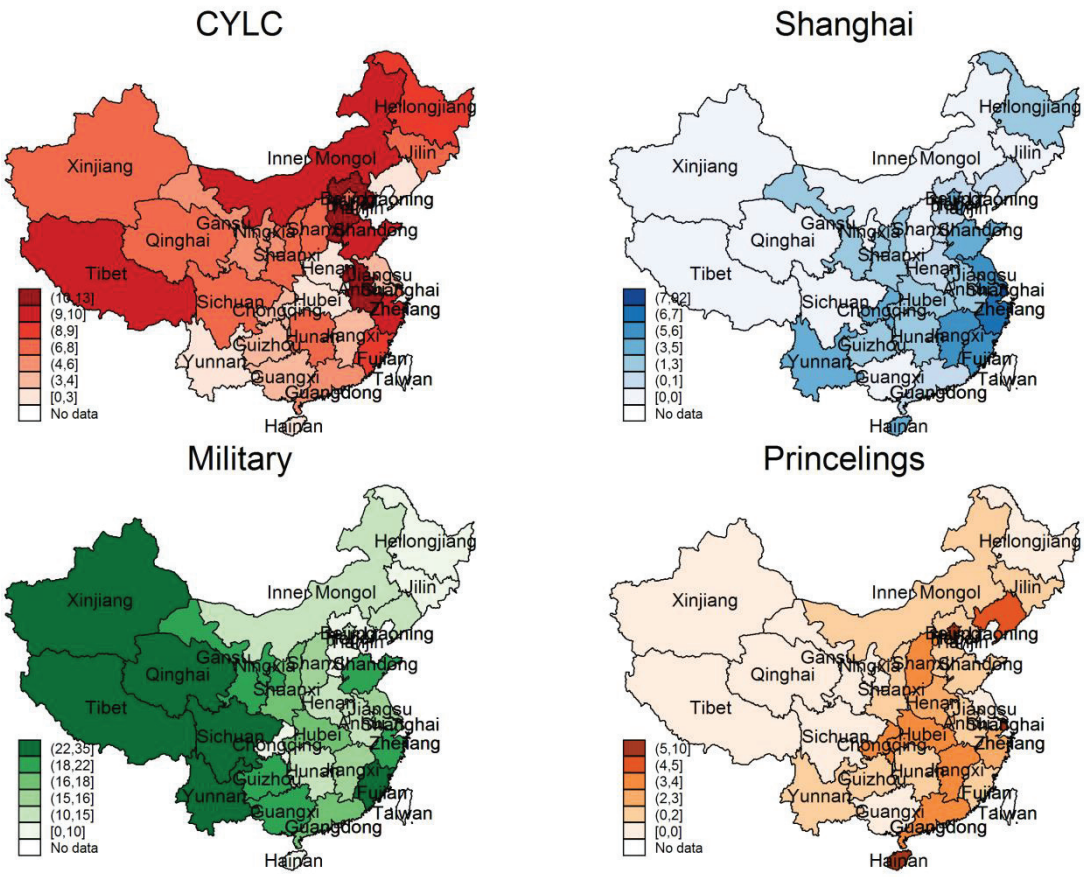


Figure 1: Geographic Distribution of Factions or Groups (1956-2014)

Notes: This graph shows the geographic distribution of factions or groups across provinces (municipalities) over the period of 1956 to 2014. The color scale represents the average share of faction or group in a province (municipality).

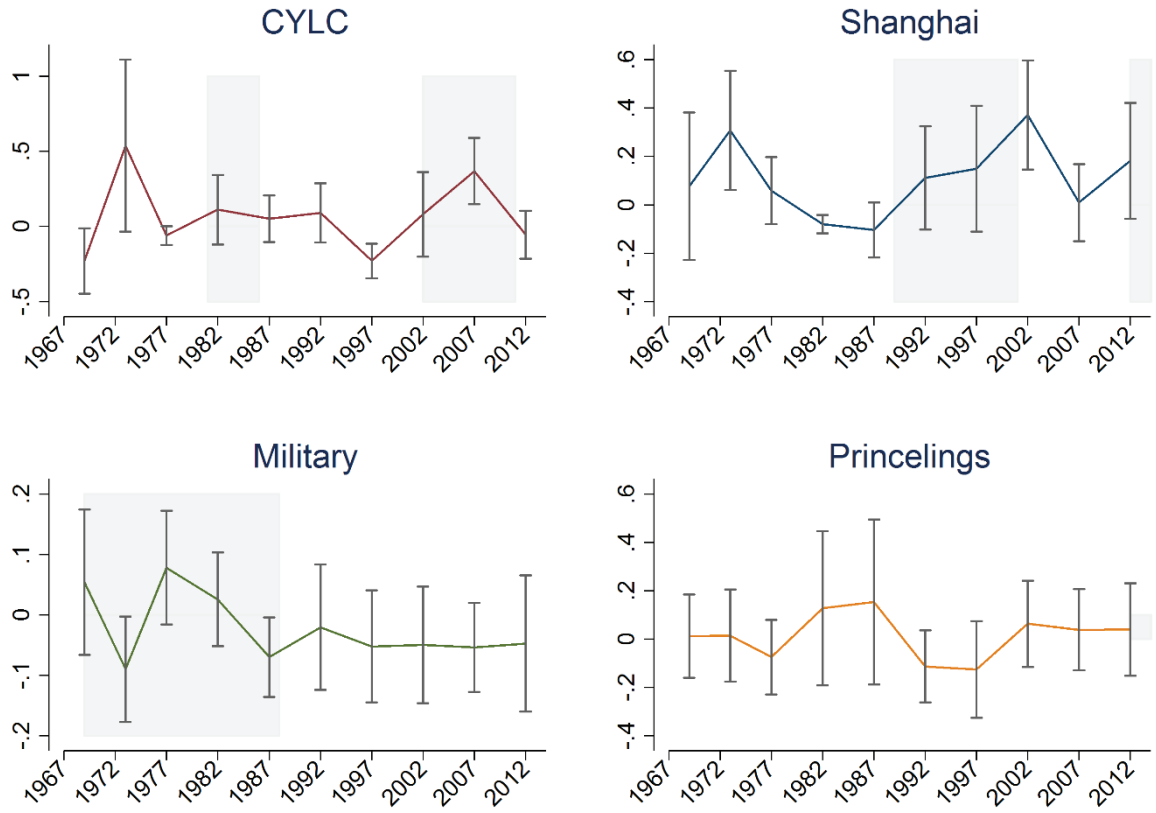


Figure 2: Leadership Premium in Promotion Rates of Each Faction or Group

Notes: This graph shows the leadership premium in promotion rates of each faction over the rest of members in the Central Committee over time. The leadership premium in promotion rates is defined as the regression coefficients of promotion dummy on faction or group affiliation. The regression is repeated for each session of Central Committee. The capped spikes indicate the standard errors of the estimates. The shaded area indicates that the General Secretary of CCP is from the same faction or group.

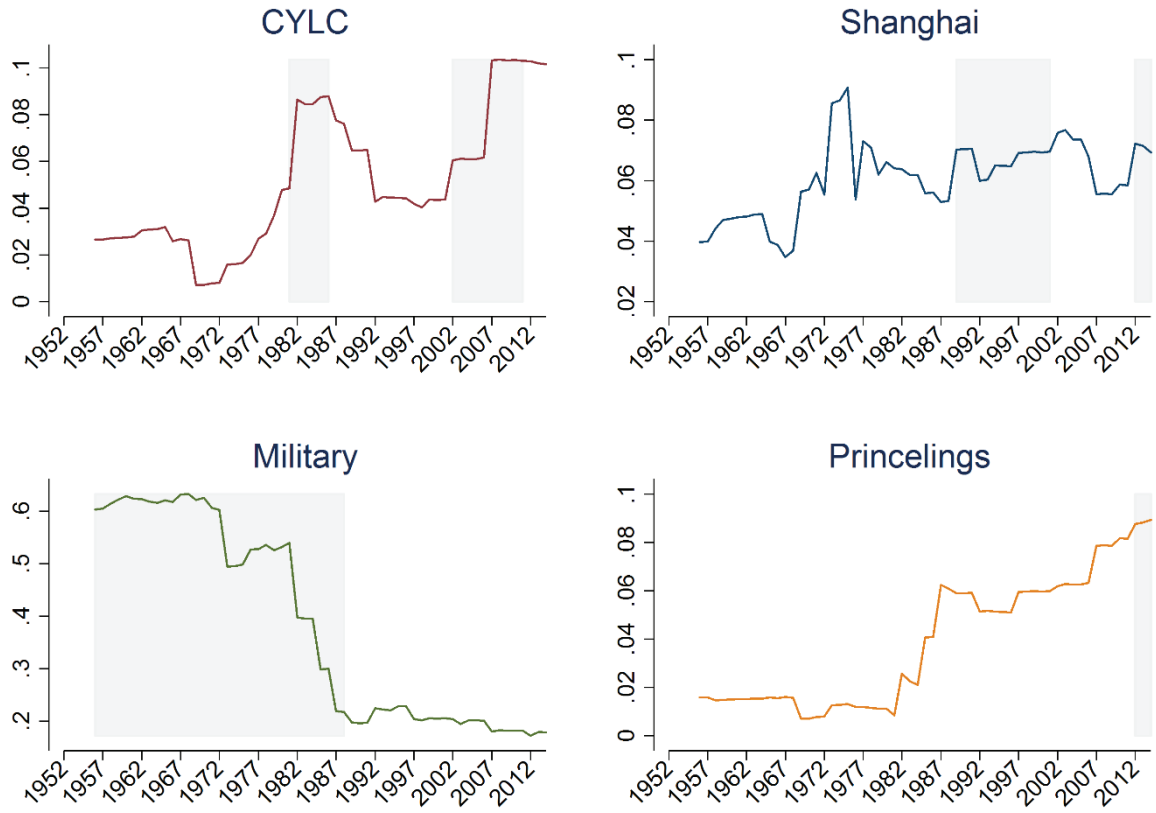


Figure 3: Leadership Premium in Power Score of Each Faction or Group

Notes: This graph shows the share of power score of each faction or group in the Central Committee over time. The power score is constructed following the scheme of Bo (2010). The shaded area indicates that the General Secretary of CCP is from the same faction or group.

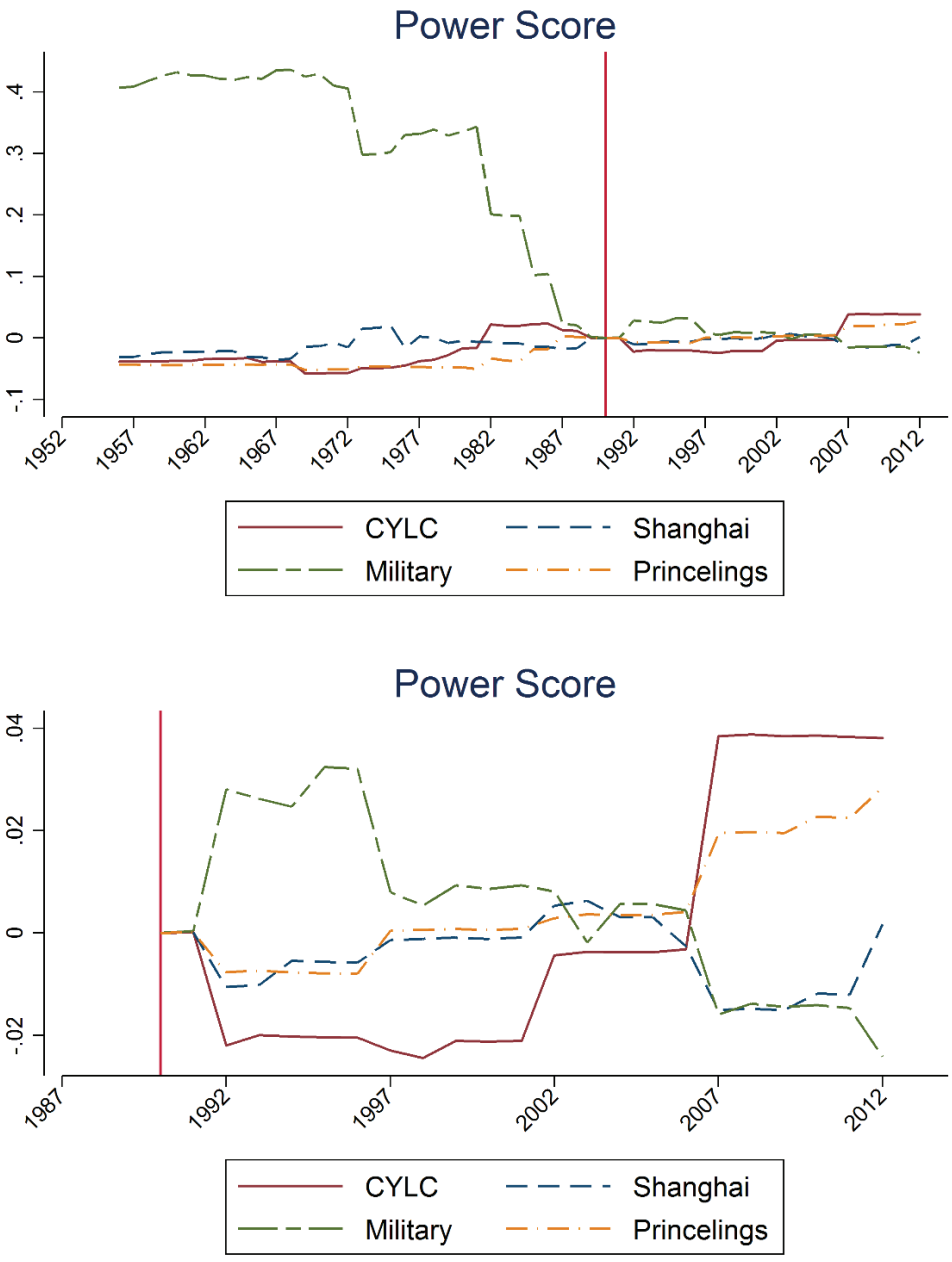


Figure 4: Power Score of Each Faction or Group in the Central Committee

Notes: This graph shows the share of power score of each faction or group in the Central Committee over time. The power score is constructed following the scheme of Bo (2010). The vertical line indicates the year of 1990, the first time when a civilian, Jiang Zemin, took over the Central Military Committee. The power score is normalized to zero in 1990. The upper panel shows the whole sample period from 1956 to 2012, the lower panel shows the post-Deng period from 1990 to 2012.

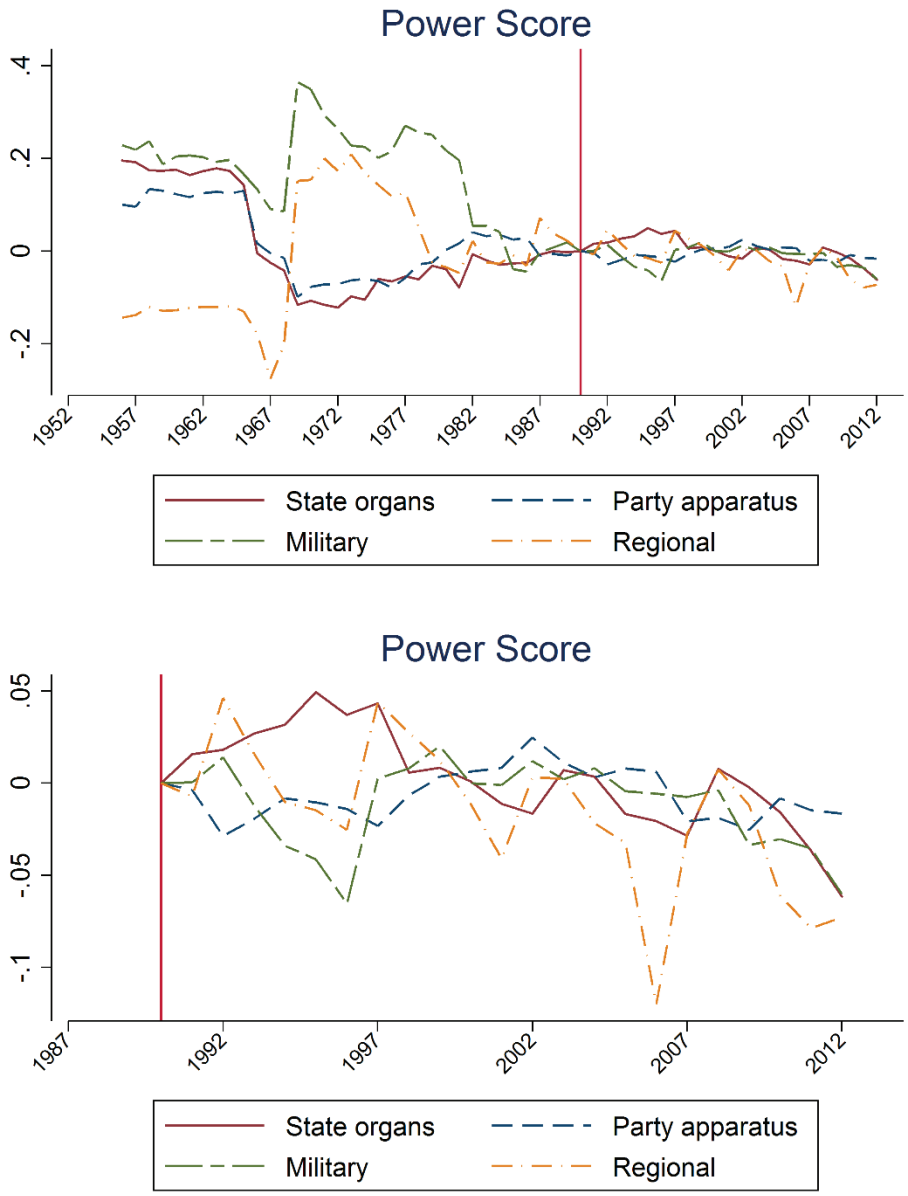


Figure 5: Power Score of Each Constituency in the Central Committee

Notes: This graph shows the share of power score for each constituency in the Central Committee over time. The power score is constructed following the scheme of Bo (2010). The vertical line indicates the year of 1990, the first time when a civilian, Jiang Zemin, took over the Central Military Committee. The power score is normalized to zero in 1990. The upper panel shows the whole sample period from 1956 to 2012, the lower panel shows the post-Deng period from 1990 to 2012.

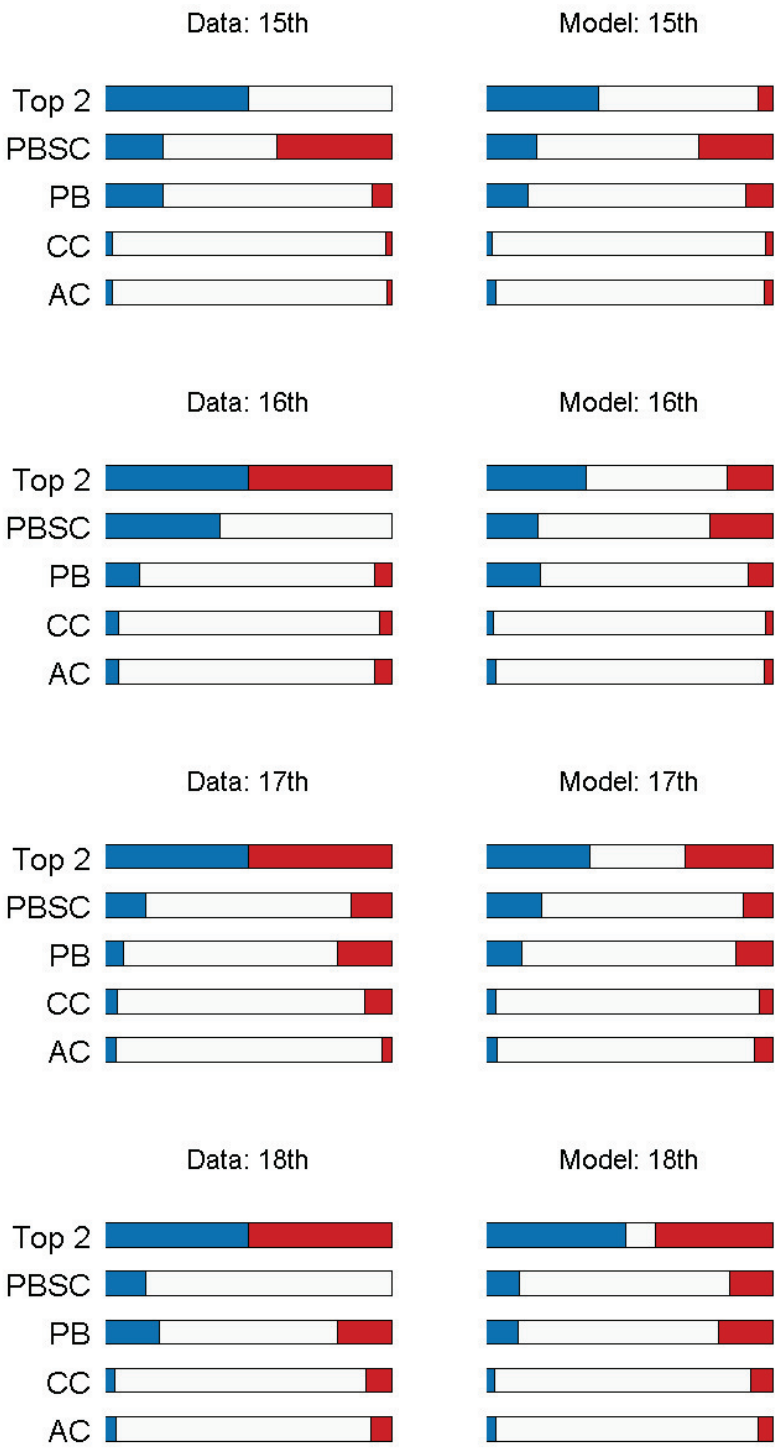


Figure 6: Seat Shares at Each Level of the Central Committee

Notes: This graph shows seat shares at each level of the Central Committee predicted by the baseline faction model and in the data. Each of the five bars represents the top two CCP positions, PBSC, PB, CC, and AC, from the top down, respectively. The blue/white/red bar represents the Shanghai Gang/Neutral/CYCL. The model is estimated using the 14^{th} to 18^{th} Central Committees and the results are averaged over 100 simulations for each Party Congress.

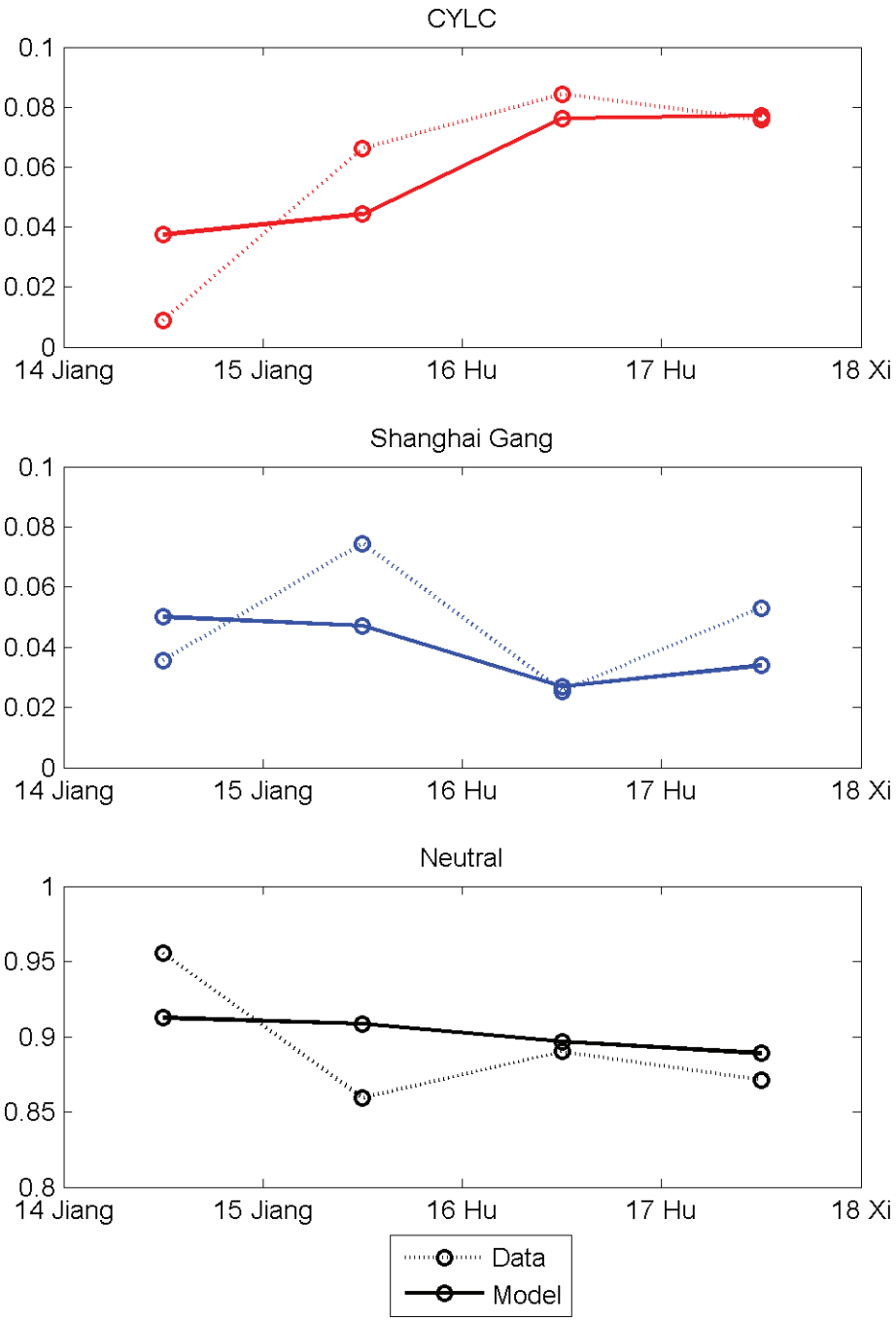


Figure 7: Aggregate Share of Promotions over Time

Notes: This graph shows the time series plot of the share of promotions of each faction over time. The share of promotions is defined as the ratio between the number of promotions of a faction and the total number of promotions to this level. The share of promotions is predicted by the baseline faction model estimated using the 14^{th} to 18^{th} Central Committees and the results are averaged over 100 simulations for each Party Congress.

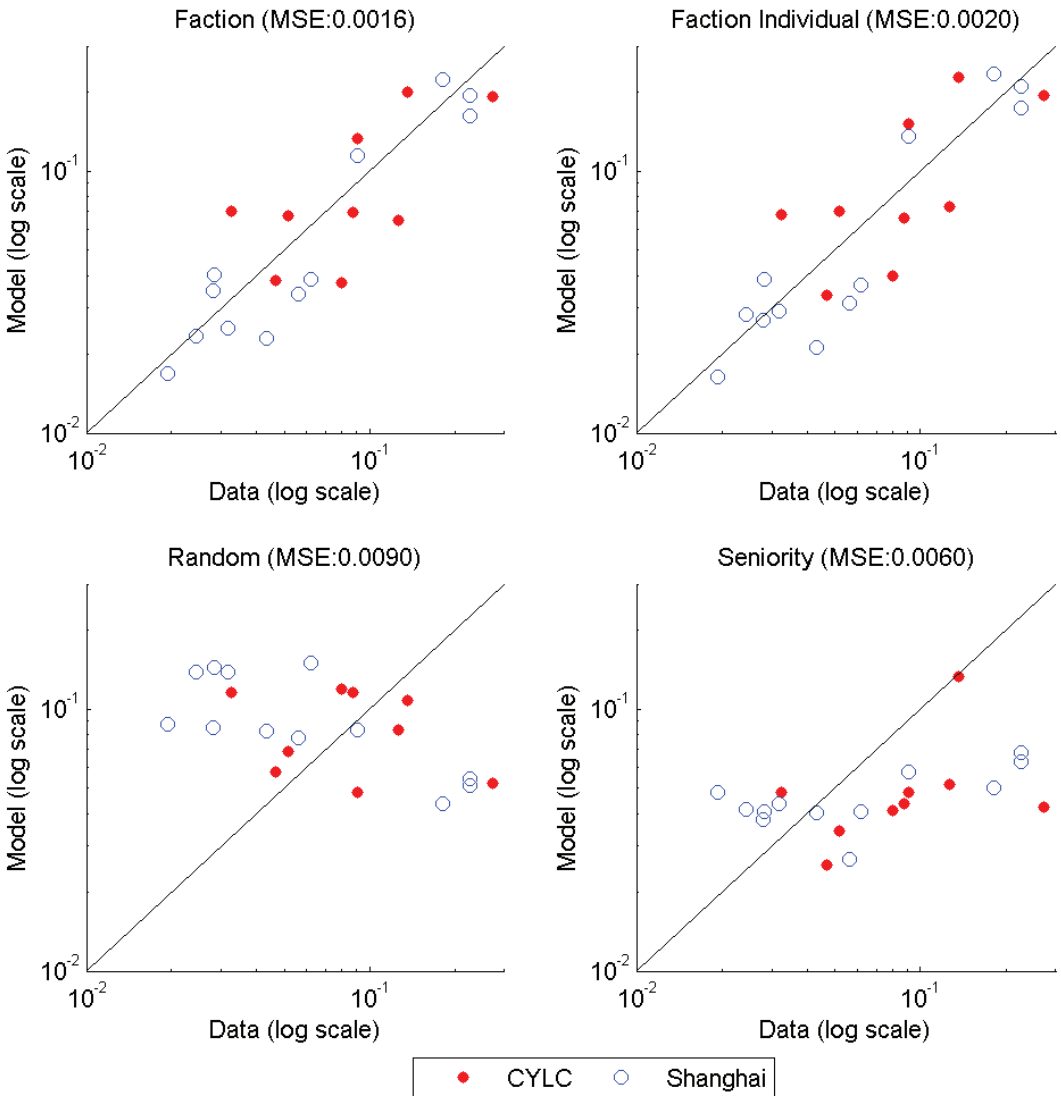


Figure 8: Model Fit (In Sample)

Notes: This graph shows the scatter plot of the model predicted share of promotions of each faction against the data. The share of promotions is defined as the ratio between the number of promotions of a faction and the total number of promotions to this level. The blue/red dot represents Shanghai Gang/CYLC. Each dot is a share of a faction at a given level of a given Party Congress. The estimation sample includes the 14^{th} to 18^{th} Central Committees and the results are averaged over 100 simulations for each Party Congress.

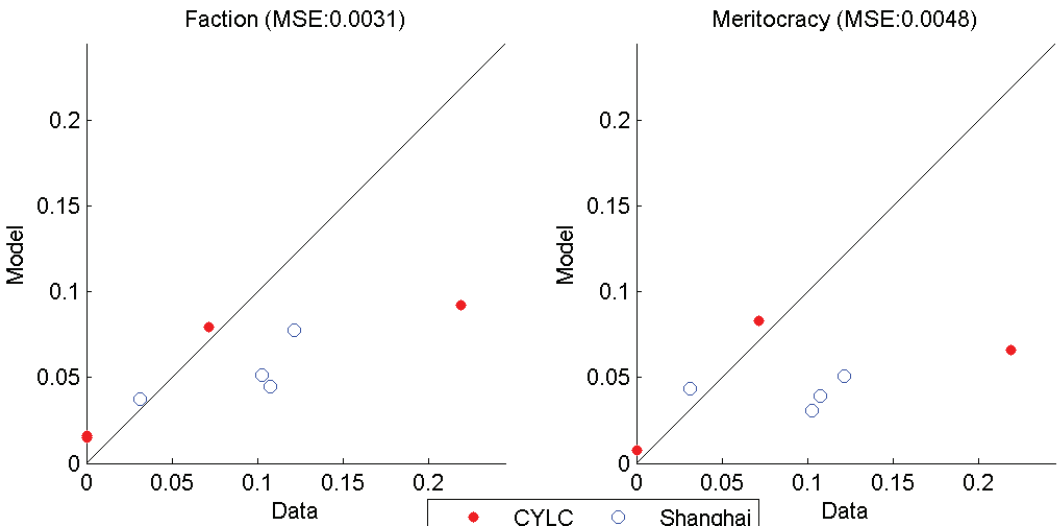


Figure 9: Meritocracy (In Sample)

Notes: This graph shows the scatter plot of the model predicted share of promotions of each faction against the data. The share of promotions is defined as the ratio between the number of promotions of a faction and the total number of promotions. The blue/red dot represents Shanghai Gang/CYLC. Each dot is a share of a faction at a given level of a given Party Congress. The estimation sample includes the 14^{th} to 18^{th} Central Committees and the results are averaged over 100 simulations for each Party Congress.

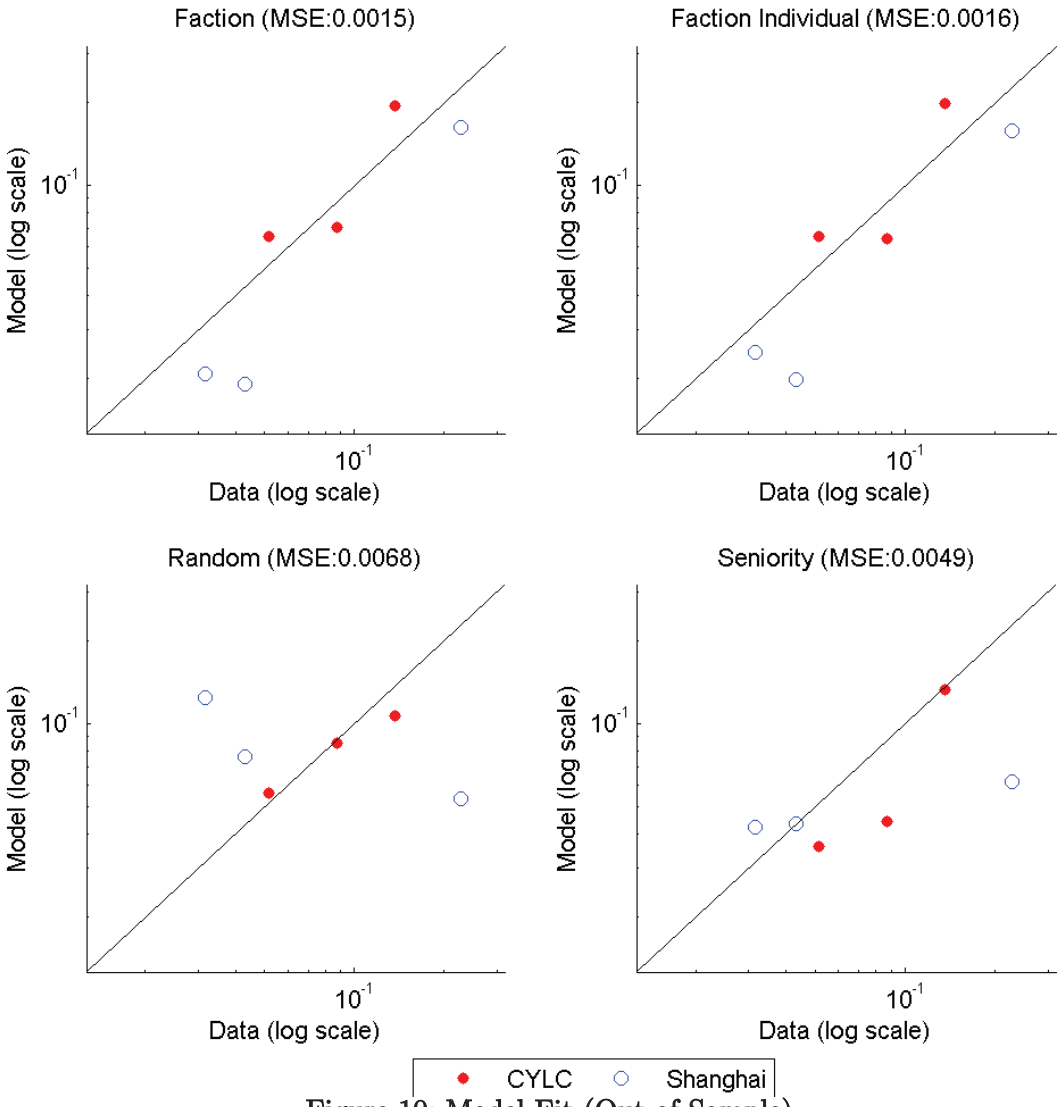


Figure 10: Model Fit (Out of Sample)

Notes: This graph shows the scatter plot of the model predicted share of promotions of each faction against the data. The share of promotions is defined as the ratio between the number of promotions of a faction and the total number of promotions to this level. The blue/red dot represents Shanghai Gang/CYLC. Each dot is a share of a faction at a given level of the 18^{th} party congress. The estimation sample includes the 14^{th} to 17^{th} Central Committees and the results are averaged over 100 simulations for each Party Congress.

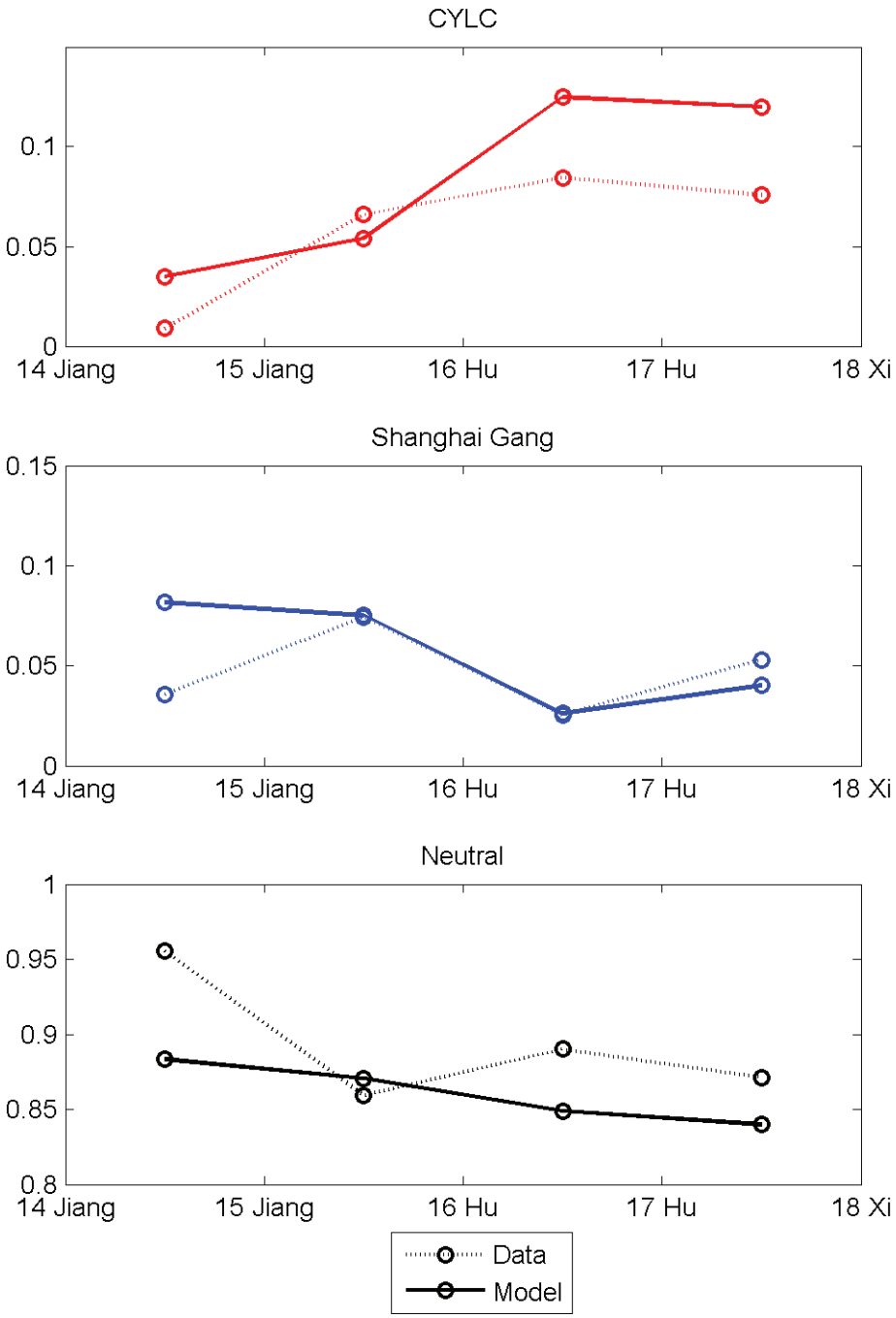


Figure 11: Counterfactual Aggregate Share of Promotions over Time (Leadership Premium × 2)

Notes: These graphs show the time series plot of the share of promotions of each faction over time. The share of promotions is defined as the ratio between the number of promotions of a faction and the total number of promotions to this level. The counterfactual simulations are conducted by doubling the leadership premium of the baseline faction model and the results are averaged over 100 simulations for each Party Congress.

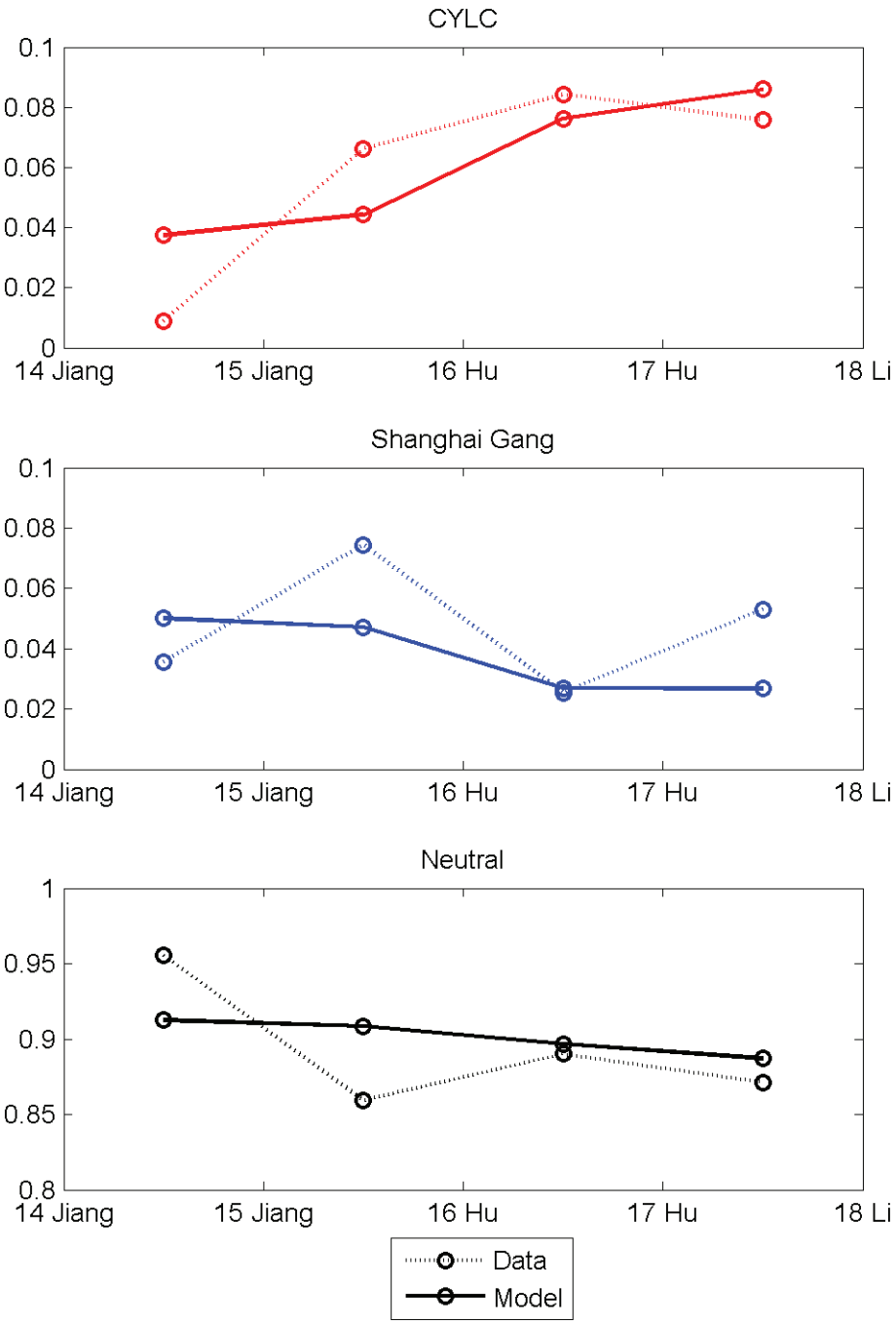


Figure 12: Counterfactual Aggregate Share of Promotions over Time (Li Keqiang Presidency)

Notes: These graphs show the time series plot of the share of promotions of each faction over time. The share of promotions is defined as the ratio between the number of promotions of a faction and the total number of promotions to this level. The counterfactual simulations are conducted by assuming Li Keqiang became the president in the 18th Party Congress and the results are averaged over 100 simulations for each Party Congress.

Table 1: Summary Statistics of Elites in China

Organizations	N	Duration	Age	Gender	Ethnicity	CYLC	Shanghai	Military	Princelings
Party Apparatus	10543	4.47	47.97	0.93	0.10	0.13	0.04	0.05	0.03
		(2.98)	(10.17)	(0.26)	(0.3)	(0.34)	(0.2)	(0.21)	(0.18)
Government	7099	3.98	46.88	0.93	0.05	0.07	0.03	0.01	0.04
		(12.54)	(9.71)	(0.25)	(0.22)	(0.25)	(0.17)	(0.09)	(0.19)
Military	2091	4.07	44.10	0.99	0.02	0.01	0.02	0.91	0.06
		(3.86)	(14.98)	(0.1)	(0.15)	(0.12)	(0.13)	(0.29)	(0.23)
People's Congress	1696	5.34	56.43	0.89	0.13	0.07	0.03	0.04	0.02
		(3.23)	(8.94)	(0.31)	(0.34)	(0.26)	(0.17)	(0.2)	(0.14)
CPPCC	1413	6.95	59.72	0.90	0.12	0.06	0.04	0.01	0.02
		(52.9)	(9.91)	(0.29)	(0.33)	(0.23)	(0.18)	(0.12)	(0.14)
Court	213	4.46	37.16	0.97	0.22	0.08	0.02	0.00	0.00
		(3.87)	(8.59)	(0.17)	(0.41)	(0.26)	(0.14)	(0)	(0)
Procuratorate	53	5.34	46.51	0.92	0.10	0.11	0.08	0.00	0.00
		(3.16)	(11.89)	(0.27)	(0.31)	(0.32)	(0.27)	(0)	(0)
CYLC	521	3.85	31.91	0.87	0.12	0.77	0.01	0.00	0.03
		(2.88)	(7.14)	(0.33)	(0.32)	(0.42)	(0.11)	(0.06)	(0.16)
Business	4590	4.27	42.99	0.93	0.04	0.04	0.04	0.01	0.02
		(4.62)	(13.66)	(0.25)	(0.2)	(0.19)	(0.19)	(0.09)	(0.14)
Media	500	4.72	40.74	0.98	0.06	0.10	0.04	0.01	0.03
		(4.61)	(11.73)	(0.15)	(0.24)	(0.3)	(0.2)	(0.12)	(0.18)
Education	3781	2.88	34.04	0.92	0.03	0.04	0.03	0.02	0.02
		(4.23)	(12.38)	(0.26)	(0.16)	(0.21)	(0.17)	(0.14)	(0.13)
Unclassified	3558	3.94	40.00	0.90	0.07	0.06	0.03	0.03	0.03
		(4.39)	(13.58)	(0.3)	(0.26)	(0.24)	(0.17)	(0.16)	(0.16)

Notes: This table shows summary statistics of demographics and career paths of 4,494 elites who hold import positions in government, politics, the military, education, business, and media in China since 1992. The unit of observation is position-individual pair. We report means and standard deviation, in parentheses below. N is the number of observations in each type of organization. Duration is the length of tenure in the position. Age is the age when an individual first started the job. Gender equals 1 if an individual is male, 0 otherwise. Ethnicity equals 1 if a member is from an ethnic minority, 0 otherwise. CYLC/Shanghai/Military/Princelings equals 1 if an individual is from CYLC/Shanghai/Military/Princelings faction/group, 0 otherwise. The data source for this table is China Vitae.

Table 2: Summary Statistics of Central Committee Members

C.C.	Year	N	Gender	Age	College	Graduate	Mishu	Ethnicity	Abroad	Promotion	Retirement	CYLC	Shanghai	Military	Princelings
8	1956	173	0.95	51.23	0.40	0.00	0.34	0.03	0.07	0.14	0.51	0.03	0.05	0.56	0.02
			(0.21)	(6.97)	(0.49)	(0)	(0.48)	(0.17)	(0.25)	(0.35)	(0.5)	(0.18)	(0.21)	(0.5)	(0.13)
9	1969	278	0.92	51.82	0.33	0.01	0.09	0.03	0.07	0.11	0.26	0.01	0.05	0.56	0.01
			(0.26)	(11.71)	(0.47)	(0.1)	(0.29)	(0.16)	(0.25)	(0.31)	(0.44)	(0.1)	(0.23)	(0.5)	(0.08)
10	1973	318	0.88	52.36	0.36	0.01	0.09	0.02	0.08	0.09	0.42	0.02	0.07	0.44	0.01
			(0.32)	(12.94)	(0.48)	(0.1)	(0.29)	(0.15)	(0.27)	(0.29)	(0.49)	(0.12)	(0.25)	(0.5)	(0.11)
11	1977	331	0.90	56.88	0.38	0.01	0.06	0.02	0.08	0.07	0.62	0.03	0.06	0.44	0.02
			(0.3)	(11.95)	(0.49)	(0.09)	(0.24)	(0.14)	(0.27)	(0.26)	(0.49)	(0.17)	(0.23)	(0.5)	(0.12)
12	1982	344	0.93	59.61	0.58	0.04	0.12	0.04	0.09	0.13	0.62	0.08	0.06	0.33	0.02
			(0.25)	(8.08)	(0.49)	(0.2)	(0.32)	(0.2)	(0.29)	(0.34)	(0.49)	(0.26)	(0.23)	(0.47)	(0.15)
13	1987	285	0.93	56.11	0.79	0.09	0.15	0.05	0.11	0.15	0.40	0.05	0.06	0.21	0.05
			(0.26)	(6.55)	(0.41)	(0.28)	(0.36)	(0.22)	(0.32)	(0.36)	(0.49)	(0.22)	(0.23)	(0.41)	(0.22)
14	1992	318	0.92	56.87	0.88	0.11	0.13	0.07	0.10	0.18	0.45	0.03	0.03	0.21	0.04
			(0.26)	(6.18)	(0.32)	(0.32)	(0.34)	(0.25)	(0.31)	(0.38)	(0.5)	(0.16)	(0.18)	(0.41)	(0.19)
15	1997	343	0.93	56.51	0.95	0.17	0.11	0.06	0.11	0.18	0.48	0.02	0.04	0.20	0.05
			(0.26)	(5.72)	(0.22)	(0.38)	(0.31)	(0.23)	(0.31)	(0.39)	(0.5)	(0.15)	(0.19)	(0.4)	(0.22)
16	2002	356	0.93	56.05	0.98	0.31	0.07	0.07	0.10	0.16	0.47	0.05	0.06	0.19	0.05
			(0.26)	(5.33)	(0.15)	(0.46)	(0.26)	(0.26)	(0.3)	(0.36)	(0.5)	(0.22)	(0.23)	(0.39)	(0.23)
17	2007	366	0.90	56.15	0.87	0.52	0.10	0.07	0.11	0.21	0.48	0.07	0.04	0.17	0.06
			(0.29)	(5.68)	(0.34)	(0.5)	(0.29)	(0.25)	(0.31)	(0.41)	(0.5)	(0.26)	(0.2)	(0.37)	(0.23)
18	2012	373	0.91	56.50	0.87	0.68	0.17	0.07	0.10	0.00	0.00	0.09	0.05	0.17	0.05
			(0.29)	(4.73)	(0.34)	(0.47)	(0.38)	(0.26)	(0.3)	(0)	(0)	(0.29)	(0.21)	(0.37)	(0.23)

Notes: This table shows summary statistics of the members of the 8^{th} -18^{th} Central Committees. 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. Graduate 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. Ethnicity equals 1 if a member is an ethnic minority, 0 otherwise. Promotion equals to 1 if a member will be promoted in the next session of Central Committee, 0 otherwise. Retirement equals to 1 if a member will retire 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/group, 0 otherwise.

Table 3: Geographical Distribution of Factions and Groups

Dependent Variable: Average Share of Faction or Group				
	(1) Shanghai	(2) CYLC	(3) Military	(4) Princelings
GDP per capita	0.644**	-0.652	-2.141***	1.517***
	[0.265]	[0.623]	[0.741]	[0.319]
Constant	1.705***	7.309***	19.97***	0.693*
	[0.533]	[0.915]	[1.875]	[0.374]
Observations	30	31	31	31
Adjusted R-squared	0.040	0.011	0.053	0.396

Notes: This table shows the cross-section regressions of the share of each faction in provinces (municipalities) on the average provincial (municipal) GDP per capita over the period of 1956-2014. The share of a faction in a province is defined as the ratio of the number of faction members who have worked in this province (municipality) over the total number of central committee members who have worked in the same place during their careers. Robust standard errors are reported in the bracket. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively.

Table 4: Factional Mix

	(1) All	(2) All	(3) All	(4) All	(5) Provincial	(6) National
Year F.E.	N	Y	N	Y	Y	Y
Position F.E.	N	N	Y	Y	Y	Y
Dependent Variable			CYLC1			
CYLC2	-0.139**	-0.185***	-0.189**	-0.245***	-0.136*	-0.499**
	[0.0568]	[0.0594]	[0.0755]	[0.0723]	[0.0693]	[0.143]
Observations	794	794	794	794	648	145
Adjusted R-squared	0.016	0.070	0.193	0.254	0.242	0.180
Dependent Variable			Shanghai1			
Shanghai2	-0.105***	-0.132***	-0.353*	-0.378**	-0.0319	-0.802*
	[0.0319]	[0.0346]	[0.180]	[0.175]	[0.0466]	[0.341]
Observations	773	773	773	773	627	145
Adjusted R-squared	0.006	0.011	0.382	0.392	0.187	0.278
Dependent Variable			Princelings1			
Princelings2	-0.0535	-0.0595	-0.132**	-0.134**	-0.155*	-0.0411
	[0.0505]	[0.0523]	[0.0571]	[0.0545]	[0.0806]	[0.114]
Observations	794	794	794	794	648	145
Adjusted R-squared	0.001	0.020	0.133	0.154	0.202	0.227

Notes: This table shows panel regressions of the factional affiliation of the number 1 official on the number 2 official in the same political office. The top/middle/bottom panel shows results for CYLC/Shanghai/princelings respectively. Variable CYLC1 (CYLC2) is a dummy which equals to 1 if number 1 (2) official is from the CYLC faction. Shanghai1, Shanghai2, Princelings1 and Princelings2 and defined similarly. Column 1-4 include all positions, and Column 5-6 break down to provincial and national level positions. The provincial positions include 31 provincial and municipal units (secretary and governor). The position in Shanghai Municipality is excluded in the regression sample for Shanghai Gang. 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). Standard errors are clustered at both position unit and year level. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively.

Table 5: Factional Mix (Shanghai vs. CYCL)

Dependent Variable:	Shanghai1					CYLC1			
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
CYLC2	0.164*	0.166*	0.187**	0.196**	Shanghai2	0.368*	0.315	0.396*	0.338*
	[0.0850]	[0.0818]	[0.0747]	[0.0761]		[0.188]	[0.197]	[0.207]	[0.197]
Year F.E.	N	Y	N	Y		N	Y	N	Y
Position F.E.	N	N	Y	Y		N	N	Y	Y
Observations	773	773	773	773		773	773	773	773
Adjusted R-squared	0.046	0.047	0.376	0.381		0.043	0.069	0.207	0.239

Notes: 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 Shanghai1 (Shanghai2) is a dummy which equals to 1 if number 1 (2) official is from the Shanghai faction. Variable CYLC1 (CYLC2) is a dummy which equals to 1 if number 1 (2) official is from the CYLC faction. The sample period is from 1992 to 2014. Column 1-4 include all positions, and Column 5-6 break down to provincial and national level positions. The provincial positions include 31 provincial and municipal units (secretary and governor) excluding Shanghai Municipality. 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). Standard errors are clustered at both position unit and year level. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively.

Table 6: Leadership Premia in Promotion and Retirement

	Promotion		Retirement	
	(1)	(2)	(1)	(2)
CYLC	0.0397	0.0299	-0.111**	-0.132***
	[0.0450]	[0.0456]	[0.0439]	[0.0430]
CYLC*CYLC Secretary	0.206**	0.242**	-0.0797	-0.101
	[0.0943]	[0.0959]	[0.0818]	[0.0836]
Shanghai	0.0144	0.0281	-0.0353	-0.0614
	[0.0371]	[0.0373]	[0.0493]	[0.0498]
Shanghai*Shanghai Secretary	0.193***	0.170**	-0.0394	0.0212
	[0.0717]	[0.0727]	[0.0724]	[0.0737]
Princelings	0.0294	0.0368	-0.120**	-0.106**
	[0.0471]	[0.0468]	[0.0489]	[0.0484]
Princelings*Princelings Secretary	0.0158	-0.0125	-0.0161	-0.0772
	[0.101]	[0.103]	[0.112]	[0.116]
Military	-0.0414**	-0.0392**	0.0229	0.0160
	[0.0185]	[0.0190]	[0.0280]	[0.0287]
Military*Military Secretary	-0.0239	-0.0313	-0.109***	-0.0465
	[0.0207]	[0.0262]	[0.0324]	[0.0392]
Controls	Y	Y	Y	Y
Year F.E.	N	Y	N	Y
P-value (CYLC*CYLC Secretary=Shanghai*Shanghai Secretary)	0.8275	0.5902	0.7131	0.283
Observations	2998	2998	3113	3113
Adjusted R-squared	0.066	0.068	0.121	0.155

Notes: This table shows panel regressions of promotion and retirement indicators on the faction or group affiliation of Central Committee members interacting with the affiliation of the General Secretary. The sample includes all the members of the 8^{th} to 18^{th} Central Committees, except Politburo Standing Committee members are excluded from the promotion regressions. Promotion is a dummy which equals to 1 if a Central Committee member moves up in the rank defined by the four levels of Central Committee (1 PBSC, 2 PB, 3 CC, and 4 AC), 0 otherwise. Retirement is a dummy which equals to 1 if a Central Committee member retires from the Central Committee, 0 otherwise. Robust standard errors are reported in brackets. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively.

Table 7: Leadership Premia in Power Score and Seat Shares

	CYLC					Shanghai				
	(1) Power score	(2) AC seats	(3) CC seats	(4) PB seats	(5) PBSC seats	(1) Power score	(2) AC seats	(3) CC seats	(4) PB seats	(5) PBSC seats
Secretary	0.0420***	0.0233**	0.0340***	0.0525	0.0955*	0.0105***	-0.00802	-0.0103*	0.0786***	0.195***
	[0.00876]	[0.0102]	[0.00995]	[0.0327]	[0.0555]	[0.00382]	[0.00739]	[0.00587]	[0.0206]	[0.0398]
Observations	59	59	59	59	59	59	59	59	59	59
Adjusted R-squared	0.390	0.212	0.274	0.072	0.100	0.139	0.032	0.076	0.382	0.394
	Military					Princelings				
	(1) Power score	(2) AC seats	(3) CC seats	(4) PB seats	(5) PBSC seats	(1) Power score	(2) AC seats	(3) CC seats	(4) PB seats	(5) PBSC seats
Secretary	0.274***	0.259***	0.231***	0.410***	0.476***	0.0516***	0.0178***	0.0271***	0.169***	0.361***
	[0.0695]	[0.0724]	[0.0623]	[0.0813]	[0.0821]	[0.00784]	[0.00484]	[0.00744]	[0.0234]	[0.0243]
Observations	59	59	59	59	59	59	59	59	59	59
Adjusted R-squared	0.533	0.541	0.485	0.583	0.558	0.165	0.046	0.044	0.179	0.465

Notes: This table shows regressions of the power scores and seat shares of each faction or group on the affiliation of the General Secretary. The dependent variables are the power score (Score), the share of Alternative Central Committee members (AC), the share of full Central Committee members (CC), the share of Politburo members (PB), and the share of Politburo Standing Committee members (PBSC). The independent variable Secretary is a dummy which equals to 1 if the General Secretary is from the same faction, 0 otherwise. The top left panel (column 1-5) reports the results for the CYLC faction. The top right panel (column 6-10) reports the results for the Shanghai faction. The bottom left panel (column 1-5) reports the results for the Military group, the bottom right panel (column 6-10) reports the results for the Princeling group. The sample period is from 1956 to 2014. Newey-West standard errors with 5 lags are reported in brackets. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively.

Table 8: Anticorruption and Factional Affiliation

Dependent Variable	Corruption
CYLC	0.0272
	[0.0237]
Shanghai	-0.0229
	[0.0237]
Princelings	0.0189
	[0.0321]
Gender	0.0139
	[0.0167]
Ethnicity	-0.0191
	[0.0168]
AC	-0.0350**
	[0.0136]
CC	-0.00920
	[0.0129]
PB	0.0125
	[0.0407]
PBSC	0.0328
	[0.0583]
age	-0.00596***
	[0.000649]
Observations	2240
Adjusted R-squared	0.032

Notes: This table shows the cross-sectional regression of a corruption dummy on the faction or group affiliation of an official. Corruption is defined as 1 if the official is investigated or prosecuted according to ChinaFile and the China's Central Commission for Discipline Inspection (CCDI) website, and 0 otherwise. The sample includes all the individuals except military personnel covered by China Vitae who have not retired in the year of 2007, the year of 17th Party Congress. Robust standard errors are reported in brackets. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively.

Table 9: Parameter Estimates of the Faction Model

	(1)		(2)		(3)		(4)
ρ	0.045***	ρ_H	0.162**	ρ	0.042***	ρ_H	0.153**
	[0.008]		[0.063]		[0.009]		[0.062]
β	0.029***	β_H	0.193***	β	0.033***	β_H	0.241**
	[0.006]		[0.068]		[0.010]		[0.103]
λ	2.553***	ρ_L	0.041***	λ_R	2.791***	ρ_L	0.037***
	[0.511]		[0.007]		[0.720]		[0.008]
		β_L	0.022***	λ_B	2.178***	β_L	0.027***
			[0.005]		[0.758]		[0.009]
		λ	2.526***			λ_R	2.898***
			[0.514]				[0.761]
						λ_B	1.956***
							[0.699]
Log-LL	-2766		-2747		-2766		-2746
Log-LLR	-19.305		-0.378		-19.142		-
P-value	0.000		0.385		0.000		-

Notes: This table shows the parameter estimates of the faction model for different specifications. The sample includes all the members of the 14th to 18th Central Committees. Standard errors are reported in brackets. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively. The bottom panel shows log-likelihood, log-likelihood ratio, and p-value of the log-likelihood ratio tests for each specification against model (4) as the alternative hypothesis. The estimator employs 100 simulations for each Party Congress.

Table 10: Parameter Estimates of Alternative Models

	Baseline Faction Model		Faction with Individual Characteristics		Random		Seniority
ρ_H	0.162**	ρ_H	0.174**	Red Entry	0.043	Red Entry	0.043
	[0.063]		[0.069]				
β_H	0.193***	β_H	0.201***	Blue Entry	0.043	Blue Entry	0.043
	[0.068]		[0.072]				
ρ_L	0.041***	ρ_L	0.043***			Age1	0.464***
	[0.007]		[0.008]				[0.105]
β_L	0.022***	β_L	0.023***			Age2	-1.213***
	[0.005]		[0.005]				[0.127]
λ	2.526***	λ	2.390***			Age3	-0.428***
	[0.514]		[0.531]				[0.050]
		Princeling	0.413**				
			[0.202]				
		Military	0.129				
			[0.122]				
		College	-0.152				
			[0.164]				
		Graduate	-0.222*				
			[0.119]				
		Minority	-0.813***				
			[0.208]				
		Gender	0.926***				
			[0.237]				
		Age1	0.361***				
			[0.109]				
		Age2	-1.201***				
			[0.136]				
		Age3	-0.421***				
			[0.055]				
Log-LL	-2747		-2617		-2763		-2660
Log-LLR	-129.976		-		-		-
P-value	0.000		-		-		-
Vuong	-		-		-13.429		-7.026
P-value	-		-		0.000		0.000

Notes: This table shows the parameter estimates of four alternative models of CCP promotion dynamics. The sample includes all the members of the 14th to 18th Central Committees. The probability of entry for seniority and random model is calibrated using the mean faction shares in the sample. Standard errors are reported in brackets. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively. The estimator employs 100 simulations for each Party Congress. The bottom panel shows log-likelihood, log-likelihood ratio, p-value of the log-likelihood ratio tests, Vuong test statistics, and the p-value of the Vuong tests for each model against the model "faction with individual characteristics" column as the alternative hypothesis.

Table 11: Share of promotion of Each Faction by Level of the Central Committee

		Data			Baseline Faction Model			Counterfactual (Leadership Premium×2)			Counterfactual (Li Keqiang Presidency)		
		B	N	R	B	N	R	B	N	R	B	N	R
14^{th}													
	PB	18.18%	81.82%	0.00%	22.41%	68.25%	9.33%	33.76%	59.30%	6.95%	22.41%	68.25%	9.33%
	CC	2.80%	96.26%	0.93%	3.48%	93.19%	3.33%	6.09%	90.59%	3.32%	3.48%	93.19%	3.33%
	AC	2.83%	96.23%	0.94%	4.01%	92.65%	3.34%	6.60%	90.24%	3.16%	4.01%	92.65%	3.34%
15^{th}													
	PB	22.73%	68.18%	9.09%	19.42%	67.28%	13.30%	32.43%	53.14%	14.43%	19.42%	67.28%	13.30%
	CC	5.61%	89.72%	4.67%	3.40%	92.77%	3.83%	6.16%	89.29%	4.55%	3.40%	92.77%	3.83%
	AC	6.19%	85.84%	7.96%	3.85%	92.40%	3.75%	5.60%	89.51%	4.89%	3.85%	92.40%	3.75%
16^{th}													
	PB	9.09%	63.64%	27.27%	11.50%	69.25%	19.25%	9.96%	61.59%	28.45%	11.50%	69.25%	19.25%
	CC	1.94%	85.44%	12.62%	1.68%	91.83%	6.49%	1.81%	86.49%	11.70%	1.68%	91.83%	6.49%
	AC	2.44%	94.31%	3.25%	2.34%	90.61%	7.05%	2.27%	86.57%	11.16%	2.34%	90.61%	7.05%
17^{th}													
	PB	22.73%	63.64%	13.64%	16.27%	63.70%	20.03%	16.70%	54.83%	28.47%	14.28%	63.40%	22.32%
	CC	4.31%	90.52%	5.17%	2.31%	90.94%	6.75%	3.27%	85.34%	11.39%	1.82%	90.54%	7.64%
	AC	3.17%	88.10%	8.73%	2.53%	90.52%	6.95%	3.02%	86.51%	10.47%	1.90%	90.46%	7.64%
18^{th}													

Notes: This table shows the share of promotions of each faction by level of the Central Committee in the data and predicted by the different models. The share of promotions is defined as the ratio between the number of promotions of a faction and the total number of promotions to this level. The sample includes all the members of the 14^{th} to 18^{th} Central Committees. The first panel shows the share of promotions of each faction in the data. The second panel shows the prediction by the baseline faction model. The third panel shows the counterfactual prediction in which the leadership premium is doubled comparing to the baseline faction model. The last panel shows the counterfactual prediction in which Li Keqiang becomes President in the 18^{th} Party Congress.

Table 12: Tests of Xi's Factional Affiliation

	Baseline Faction Model		Princelings as Faction		Xi as Neutral
ρ_H	0.162**	ρ_H	0.178**	ρ_H	0.164**
	[0.063]		[0.074]		[0.064]
β_H	0.193***	β_H	0.153**	β_H	0.195***
	[0.068]		[0.067]		[0.069]
ρ_L	0.041***	π_H	0.364***	ρ_L	0.044***
	[0.007]		[0.124]		[0.008]
β_L	0.022***	ρ_L	0.050***	β_L	0.027***
	[0.005]		[0.009]		[0.006]
λ	2.526***	β_L	0.027***	λ	2.150***
	[0.514]		[0.006]		[0.437]
		π_L	0.059***		
			[0.010]		
		λ	1.876***		
			[0.394]		
		λ_p	0.564		
			[0.358]		
Log LL	-2747		-2866		-2748
Vuong	-		-15.850		-0.197
P-value	-		0.000		0.422

Notes: This table shows the parameter estimates of three models of CCP promotion dynamics. The sample includes all the members of the 14th to 18th Central Committees. Standard errors are reported in brackets. The estimator employs 100 simulations for each Party Congress. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively. The bottom panel shows log-likelihood, Vuong test statistics, and the p-value of the Vuong tests for each model against the baseline faction model as the alternative hypothesis.

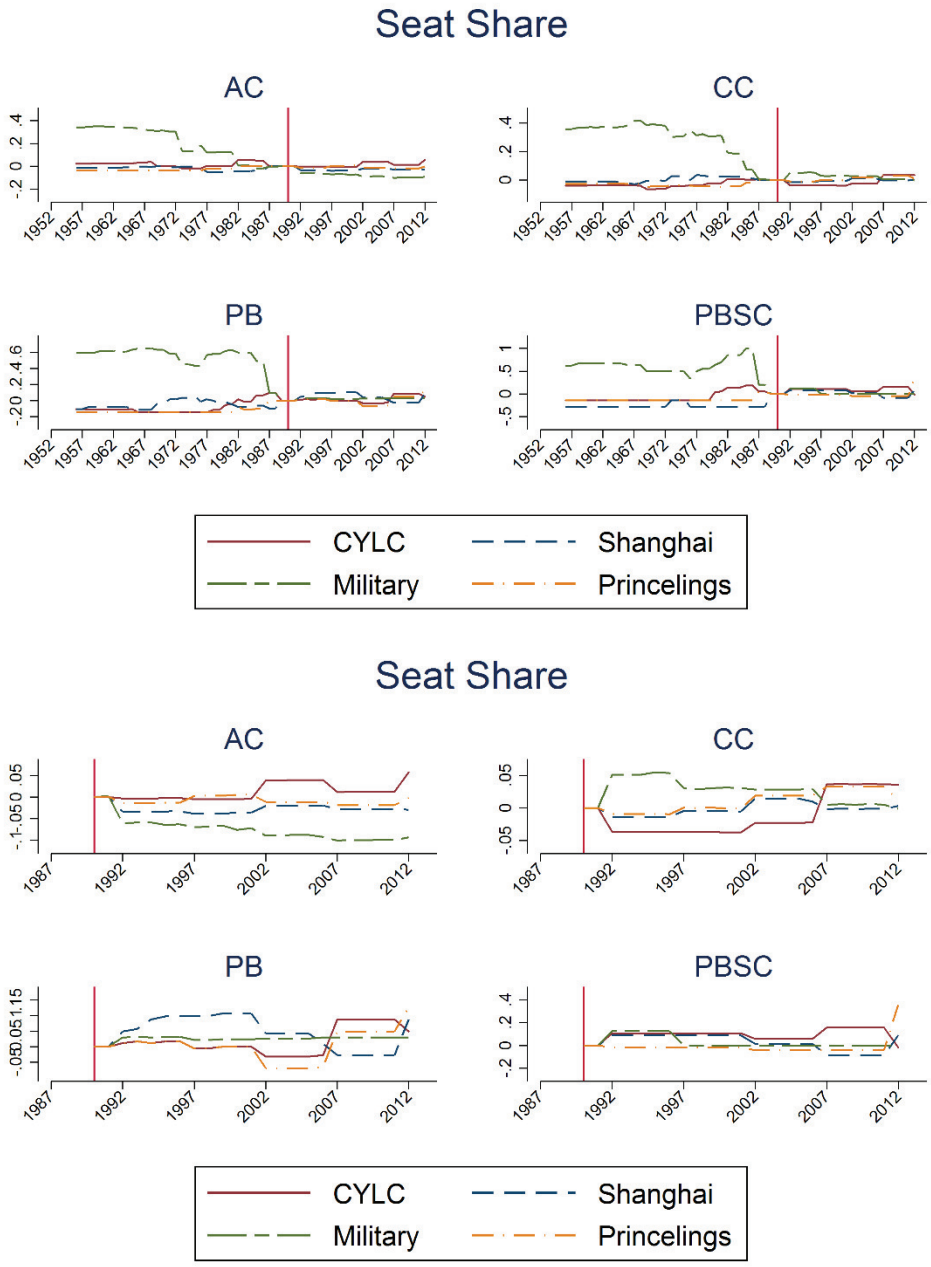
Table 13: Out-of-sample Forecast of 19th Central Committee

Xi as Shanghai Gang			
	B	N	R
PB	24.18%	66.37%	9.45%
CC	3.84%	92.72%	3.44%
AC	4.35%	91.52%	4.13%
Xi as Neutral			
PB	14.12%	75.53%	10.35%
CC	2.20%	94.03%	3.77%
AC	2.28%	93.77%	3.95%

Notes: This table shows the aggregate share of promotions of each faction at each level of the Central Committee in the 19th Central Committee predicted by the faction model with individual characteristics. The share of promotions is defined as the ratio between the number of promotions of a faction and the total number of promotions to this level. The sample used to estimate the parameters includes all the members of the 14th to 18th Central Committees. The forecast employs 100 simulations for this Party Congress.

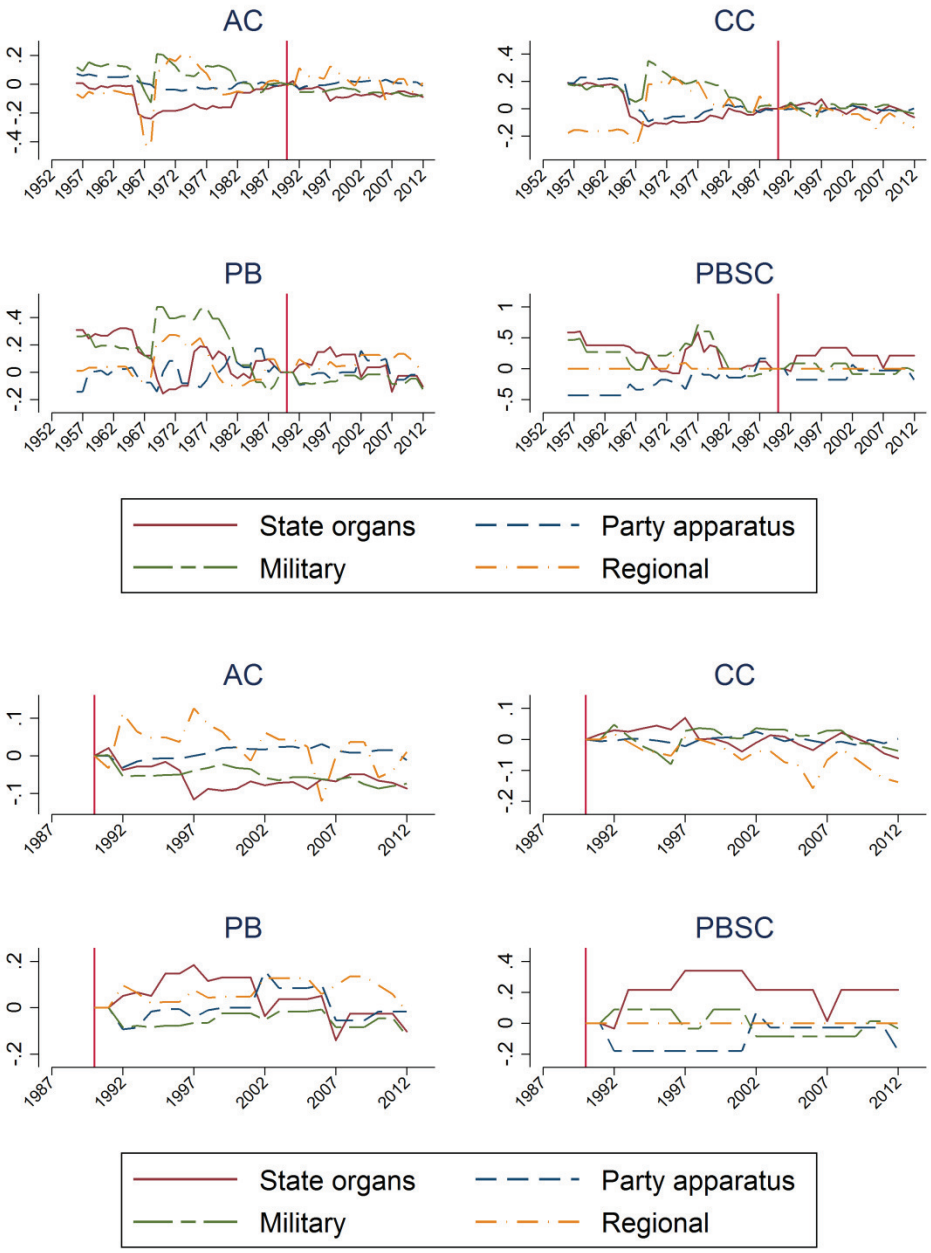
Online Appendix of "Factions in Nondemocracies: Theory and Evidence from the Chinese Communist Party"

Patrick Francois, Francesco Trebbi and Kairong Xiao



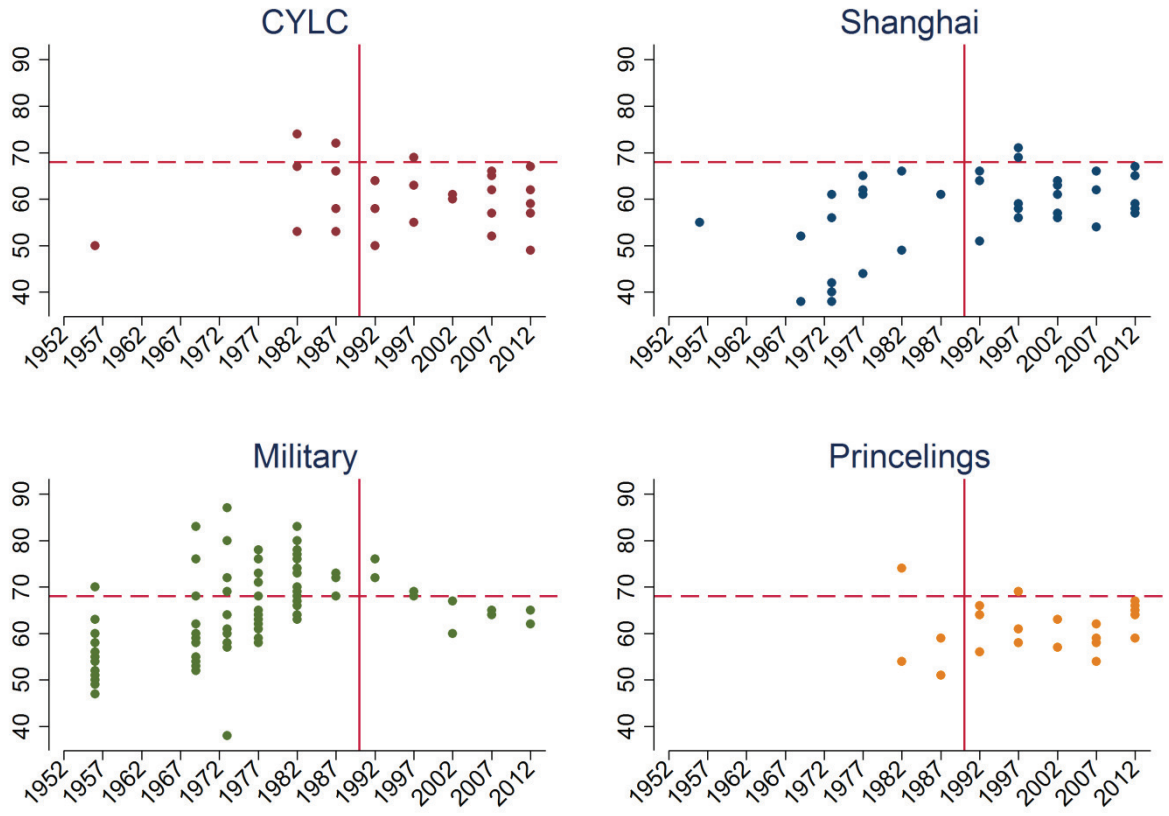
Appendix Figure 1: Seat Share of Each Faction or Group in the Central Committee

Notes: This graph shows the share of seats of each faction or group in four levels of Central Committee over time. The four levels of Central Committee include Alternative Central Committee members (AC), full Central Committee members (CC), Politburo members (PB), and Politburo Standing Committee members (PBSC). The vertical line indicates the year of 1990, the first time when a civilian chairman, Jiang Zemin, took over the Central Military Committee. The share of seats is normalized to zero in 1990. The upper panel shows the whole sample period from 1956 to 2012, the lower panel shows the post-Deng period from 1990 to 2012.



Appendix Figure 2: Seat Share of Each Constituency in the Central Committee

Notes: This graph shows the share of seats of each constituency in four levels of Central Committee over time. The four levels of Central Committee are Alternative Central Committee members (AC), full Central Committee members (CC), Politburo members (PB), and Politburo Standing Committee members (PBSC). The vertical line indicates the year of 1990, the first time when a civilian chairman, Jiang Zemin, took over the Central Military Committee. The share of seats is normalized to zero in 1990. The upper panel shows the whole sample period from 1956 to 2012, the lower panel shows the post-Deng period from 1990 to 2012.



Appendix Figure 3: Age of Politburo Members of Each Faction

Notes: This graph shows scatter plots of ages of each Politburo member by faction over time. The horizontal line is the age of 68. The vertical line indicates the year of 1990, the first time when a civilian chairman, Jiang Zemin, took over the Central Military Committee. The share of seats is normalized to zero in 1990.

Appendix Table 1: Data Sources

Source	Sample Period	Description
China Vitae	1992-2014	4,494 individuals who held important positions in government, politics, the military, education, business, and the media since 1992
Central Committee Member Data	1956-2012	1,853 individuals who are members of Central Committee of the CPC
ChinaFile/Wikipedia/CCDI	2012-2016	193 "tigers" investigated in the Chinese Anti-corruption Campaign since 2012
China Data Online	1956-2012	Provincial population and GDP

Appendix Table 2: Regression Samples

Regression Sample	Sample period	Corresponding tables
Cross-section of 31 provinces	1956-2014	Table 3
Position-year panel of important positions	1992-2014	Table 4 and 5
Individual-C.C. session panel	8^{th} -18^{th} C.C.	Table 6
Time series of power score of each faction	1956-2014	Table 7
Cross-section of individuals	2007-2014	Table 8
Individual-C.C. session panel	14^{th} -18^{th} C.C.	Table 9-13

Appendix Table 3: Promotion, Retirement, and Factional Affiliation

	Promotion		Retirement	
	(1)	(2)	(1)	(2)
CYLC	0.102**	0.0998**	-0.142***	-0.162***
	[0.0402]	[0.0410]	[0.0382]	[0.0377]
Shanghai	0.0915***	0.0961***	-0.0809**	-0.0725*
	[0.0338]	[0.0337]	[0.0396]	[0.0395]
Princelings	0.0389	0.0373	-0.103**	-0.110**
	[0.0422]	[0.0421]	[0.0443]	[0.0446]
Military	-0.0265**	-0.0175	-0.0475**	-0.0201
	[0.0135]	[0.0140]	[0.0198]	[0.0201]
Gender	0.118***	0.114***	-0.0356	-0.0514
	[0.0189]	[0.0192]	[0.0323]	[0.0317]
Age (59-62)	-0.138***	-0.146***	0.305***	0.282***
	[0.0141]	[0.0150]	[0.0228]	[0.0233]
Age (63-)	-0.145***	-0.155***	0.425***	0.399***
	[0.0135]	[0.0150]	[0.0216]	[0.0225]
College	0.0678***	0.0530***	-0.0591***	-0.114***
	[0.0125]	[0.0147]	[0.0191]	[0.0216]
Graduate School	0.0435*	0.0271	-0.0588**	-0.113***
	[0.0225]	[0.0248]	[0.0242]	[0.0267]
Mishu	0.0531	0.0498	-0.115***	-0.125***
	[0.0330]	[0.0330]	[0.0364]	[0.0358]
Ethnicity	-0.0579***	-0.0606***	-0.0525*	-0.0611**
	[0.0198]	[0.0201]	[0.0289]	[0.0286]
Abroad	0.0164	0.0230	-0.0694**	-0.0584**
	[0.0234]	[0.0247]	[0.0287]	[0.0288]
Year F.E.	N	Y	N	Y
p value (CYLC=Shanghai)	0.8439	0.9435	0.2493	0.0891
Observations	2997	2997	3045	3045
Adjusted R-squared	0.060	0.062	0.143	0.172

Notes: This table shows the panel regression of promotions and retirement dummy on the faction affiliation of Central Committee members. The sample includes all members of the 8th to 18th Central Committees, except Politburo Standing Committee members are excluded from the promotion regression. Promotion is a dummy which equals to 1 if a Central Committee member moves up in the rank defined by the four levels of Central Committee (1 PBSC, 2 PB, 3 CC, and 4 AC), 0 otherwise. Retirement is a dummy which equals to 1 if a Central Committee member retires from the Central Committee, 0 otherwise. Robust standard errors are reported in brackets. ***,**,* indicates 1 percent, 5 percent, and 10 percent significance level respectively.