Personal Ties, Meritocracy, and China's Anti-Corruption Campaign

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Abstract

We examine the targeting and motivations of the first phase of China's anti-corruption campaign under Xi Jinping (2012-2015). Combining data on officials' personal networks revealed during the campaign with biographical and economic data, we find evidence that the campaign indeed targeted corruption. In addition, individuals, networks, and geographic regions that departed sharply from meritocratic governance practices appear to have been a primary target, with higher rates of indictment. This is consistent with the party's own claim that the crackdown was designed to reduce corruption and strengthen party-led meritocracy. However, individuals with personal ties to Xi Jinping appear to be exempt from investigation while, individuals with ties to the other six members of the Politburo Standing Committee had no special protection. Taken together, these findings indicate that the crackdown served both its stated goal of strengthening the party and the unstated goal of consolidating Xi's power.

1 Introduction

Economists and policymakers now recognize the crucial role of good governance, rooted in good institutions, in achieving long-run economic growth. Among the most important functions of institutions are to select competent leaders and to hold them accountable. Democratic elections are viewed as one of the best ways to achieve this (Barro, 1973; Besley, 2006; World Bank, 2017; Ferraz and Finan, 2008). Yet autocrats must also worry about being ousted, just like elected officials do, and this increasingly hinges on maintaining at least the appearance of competence (Guriev and Treisman, 2015). To do so requires careful attention to the efficient functioning of the bureaucratic hierarchy that carries out their orders (Evans and Rauch, 1999; Rauch and Evans, 2000; Finan et al., 2015), just as in private firms (Lazear and Shaw, 2007). When personal ties or patronage play a strong role in an organization at the expense of meritocracy, its performance suffers (Bandiera et al., 2009; Colonnelli et al., 2017; Xu, 2018). Opportunities for merit-based advancement also help maintain political stability by co-opting talented individuals who might otherwise challenge the existing regime (Bai and Jia, 2016).

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China's leaders have been highly conscious of this issue. Since the late 1970s China has achieved unprecedented sustained economic growth without elections playing a major role. Instead, from early in the reform period its leaders placed an emphasis on better management of party cadres (Manion, 1985). A large body of research argues that the Party's top leaders have structured incentives for its army of bureaucrats along largely meritocratic principles, inducing them to choose growth-promoting policies (Qian and Xu, 1993; Maskin et al., 2000; Xu, 2011). Some empirical studies support this, finding an association between economic outcomes in a locality and its leader's likelihood of promotion within the party-controlled hierarchy (Li and Zhou, 2005; Chen et al., 2005; Choi, 2012; Guo, 2009; Landry, 2008; Landry et al., 2017; Chen and Kung, 2016). Other studies have challenged these findings, concluding that promotion has mainly been a reward for individual loyalty and personal connections that comes at the expense of efficiency (Qian and Xu, 1993; Maskin et al., 2000; Xu, 2011; Fisman et al., 2018). Additional research goes beyond the strict dichotomy between meritocracy and patronage implied by these studies, suggesting variously that personal ties and performance are complements (Jia et al., 2015), that personal ties harm advancement prospects (Fisman et al., 2017), that personal ties result in improved performance (Jiang, 2018), or that intra-factional competition can actually harm promotion prospects (Francois et al., 2018).

This paper contributes to the debate between these competing meritocratic and personalistic theories of Chinese politics in the context of China's massive ongoing anti-corruption campaign. This campaign was initiated by the China's top leader Xi Jinping soon after taking power at the end of 2012. Unlike prior anti-graft efforts this crackdown has taken down a large number of officials on all levels, both powerful "tigers" near the top levels of government and ordinary "flies" below them. The Chinese Communist Party (CCP) presents this campaign as a serious attempt to shake up an officialdom in which endemic self-dealing had undermined past reform efforts and harmed the party's legitimacy in the eyes of citizens, and many inside and outside China take this seriously (Manion, 2016). Others, however, argue that this initiative is aimed primarily at consolidating Xi's power by replacing his rivals and their supporters with his loyalists (Yuen, 2014; Xuecun, 2015; Eisenman and Chung, 2015; Xi et al., 2018).

These views correspond to the competing meritocratic and patronage theories of political selection and promotion in China, respectively. In the absence of electoral competition, the threat of removal from office and punishment on corruption charges could provide a strong incentive for honest behavior, a stick that complements the carrot of promotion. In addition, the crackdown could shore up the meritocratic promotion system directly by punishing and removing officials who subverted it by promoting unqualified cronies or in the worst cases selling offices outright. On the other hand, if the crackdown is simply a purge of Xi's political competitors, this would support the view that China's meritocracy is just a veneer on top of a system in which personal ties are of central importance.

We make use of several different sources of data and analytical approaches to investigate this topic. First, we take advantage of the fact that the Chinese Communist Party (CCP) has been uncharacteristically forthcoming in publicizing the identities of the people accused in the anti-corruption campaign and the relationships between them. This provides a unique glimpse into the personal networks that stretch from the party's elites down to its grassroots. Combing through a wide range of materials, we identified all individuals pub-

licly charged in the first wave of arrests between late 2012 and late 2015 and constructed a dataset of their relationships with other accused individuals. We use this data to map these networks, identifying the top targets of the campaign and demonstrating that three "big tigers" are atop the interconnected networks at the center of the crackdown. Notably, the individual viewed as Xi's most significant rival, Bo Xilai, appears to play a relatively ancillary role in network, contrary to the idea that power consolidation was the central goal of the campaign. We then briefly look at results from a 2012 survey of Chinese firms, finding that in cities where more firms found corruption to be a problem, more officials later fell in the anticorruption campaign.

We next explore other reasons why the networks of the three big tigers may have received additional attention. Creating a dataset of prefecture-level leaders, we show that the provinces in which they were most influential departed from the meritocratic standards of promotion evident in the rest of China. Rather than being rewarded for performance or relevant professional experience as in other provinces, officials in these areas advanced their careers by tolerating and most likely participating in corruption. Moreover, looking across a national sample of officials, we see that those who were promoted contrary to meritocratic standards were more likely to fall in the crackdown.

The last part of our analysis examines whether the post-2012 Politburo Standing Committee (China's top 7 leaders, led by Xi Jinping) protected its own. Of 322 top provincial leaders, none of those with potential personal ties to Xi Jinping were arrested. Digging deeper, we combine data about the networks among fallen officials with more widely available proxies for personal ties, developing a novel recursive probit model to incorporate both forms of data into our analysis. This analysis confirms the importance of the three big tigers in the crackdown and shows that the other 6 Politburo Standing Committee members did not share Xi's ability to protect their associates.[1]

From these findings we conclude that China's corruption crackdown can in important respects be taken at face value. It is a serious attempt to rein in perennial problems with official corruption. These problems had only become worse as China's economic growth and global integration enhanced the potential scale of corruption and the ease of moving ill-gotten gains offshore. As concerns mounted that maintaining the past pace of growth would become more difficult (Zilibotti, 2018), addressing this major barrier to economic efficiency became more pressing. At the same time, public awareness of the scale and scope of corruption undermined popular support for party's rule. The sincerity and effectiveness of this campaign are therefore crucial to China's future development. Our findings complement Chen and Kung (2018), which demonstrates that China's land privatization process was deeply corrupted, with steep discounts going to politically connected firms and promotions going to provincial leaders who arranged the discounts, and also that this corruption was dramatically curtailed as Xi's crackdown rolled out and his appointees replaced incumbents.[2]

At the same time, it is also quite clear that the crackdown, coupled with the protection

[1] This differs from earlier crackdowns, in which connections to the Politburo Standing Committee appear to have had a powerful protective effect (Jiang and Xu, 2015).

[2] Other studies pointing at the corruption-reducing effects of the crackdown include Qian and Wen (2015), which finds that imports of easily noticeable luxury goods declined, and Chen and Zhong (2017) which shows that after surprise visits from inspection teams, cities saw a reduction in new car sales and in business registrations in property and construction, the main sectors in which local government corruption plays out.

of Xi's associates, served to consolidate an unprecedented amount of power in one man's hands. The consequences of this are unclear and beyond the scope of this paper. On the one hand, Li et al. (2018) present a theory in which centralization of power is necessary to prevent corruption from reaching regime-destabilizing levels, suggesting that the two explanations of Xi's actions are complementary, not contradictory.[3] On the other hand, the risks of one-man rule are well-known, and devolution of power can be beneficial — Gehlbach and Keefer (2011) provide evidence that the post-Mao institutionalization of the party empowered lower-level officials to resist expropriation by central leaders and argue that this helped drive China's economic growth.

2 The corruption crackdown

2.1 Background

The anti-corruption campaign has been the largest shock to Chinese officialdom since Mao's death in 1976. While the CCP has always acknowledged corruption as a problem and has periodically launched anti-corruption campaigns in the past, this campaign has been far more wide-ranging than any before. Initiated by Xi Jinping following his confirmation as the party's top leader in November 2012, it showed no sign of abating six years later.

This crackdown has taken place almost entirely outside China's formal legal system. Instead, it is run by the CCP's Commission on Discipline and Inspection (CDI). This is possible because of two features of China's party-state structure. First, unlike political parties in democracies the CCP is a hierarchical organization in which membership is a privilege and comes with obligations. Applicants are carefully screened, with only a small fraction being accepted, and all party members are required to comply with instructions from their superiors. Second, the party has unquestioned dominance of the governing apparatus. Party members comprise the vast majority of government officials at all levels and almost all officials at the level of provincial governor or above. Just as important, at virtually every level of the state the titular "head" is supervised by the party secretary at the same level, regardless of whether that state official at the same level is a member of the party. For example, the mayor of a city or the governor of a province is always subordinate to that city's or province's party secretary. This party secretary may or may not concurrently hold a government post but this is of secondary importance. The party views the entire state apparatus, including the judiciary, as its tool, and therefore reserves to itself the right to investigate and punish its members. Party members move seamlessly back and forth from party to state positions throughout their careers, and these assignments are made by the party's powerful and secretive Organization Department (McGregor, 2010).

The procedure for charging an official with corruption typically has three stages. First is an internal investigation, conducted by the CDI. The official is detained and interrogated "at an appointed time and place" (*shuanggui*). During this detention, he[4] effectively disappears from sight and is allowed no contact with colleagues, legal counsel, and even family members.

[3] Slater (2003) documents a similar combination of simultaneous institutionalization and personalization in Malaysia.

[4] It is almost always "he". In our sample over 90% of officials are male and the percentage in our group of indicted officials is even higher.

Only when this extrajudicial process is completed and the party has rendered its judgment is the case passed on to the judicial process. The procuratorate (a prosecutorial body) then starts to collect criminal evidence and prepare for the impending prosecution. In the last step, the court hears the case and makes a formal decision.

The duration of the entire procedure varies. For complicated cases, it may last for two years or more. However, by the time the CDI is ready to detain an official, it has usually already found enough evidence to establish guilt to its own satisfaction and the legal system follows its lead. As such, announcements of probes by the Party almost always end in conviction.[5] In this paper we will therefore use the words "arrest", "probe", "investigation" and "indictment" interchangeably, regardless of the particular stage that case is in.

2.2 The Network of Fallen Officials

Chinese journalists know a great deal more than western observers about elite politics, but under ordinary circumstances must follow the rule "it's okay to swat flies, but don't hit a tiger." That is, they are often permitted to investigate officials at lower levels of government, but they must remain silent about malfeasance by the "tigers" at higher levels (Lorentzen, 2014). However, once the party has rendered its verdict on an official, the situation changes. An indictment on corruption charges both provides an impetus for further reporting and opens the floodgates for journalists to disclose what they may have known already. We took advantage of this fact to gather data on the personal connections of Chinese officials that in ordinary circumstances could only be imputed based on noisy proxies such as overlapping work histories. Our list of fallen officials includes all publicly announced investigations posted on the CDI website from November 2012 to September 2015, the first wave of the crackdown.[6] By September 2015, more than 1000 names had been added to the CDI's list, at the rate of almost one per day. Among these names, 82 were senior officials at or above the deputy governor level, and four were national leaders.[7]

For each of these officials we searched all available party reports, news items, and legal documents about the cases to document these connections. Based on these reports, we recorded a pair of officials as having a patron-client relationship if such a relationship was reported in published legal or party documents or stated either as fact or as rumor by a bylined news article from an authoritative Chinese news outlet. We erred on the side of conservatism where the validity of the claimed connection was in question.

Figure 1 graphs the hierarchical network implied by our data. Each node represents a probed official. A line connecting two dots represents a reported political connection and the arrows point upward from clients to patrons. The size of each node is determined by its rank in the network according to the PageRank algorithm, which ranks each node based on the number of other nodes linked to it and their ranks in a recursive process (Brin and Page, 1998). That means a node (an individual) increases in rank not just because it has many subordinates but also if those subordinates in turn head larger networks.

[5] In our research we have not been able to identify any investigations that resulted in dropped charges or exoneration.

[6] http://www.ccdi.gov.cn/jlsc/.

[7] A vice-minister and a province's deputy governor hold the same rank. Ranks in provincial government, central ministries, and party bodies are all comparable as a consequence of the party's hierarchical control.

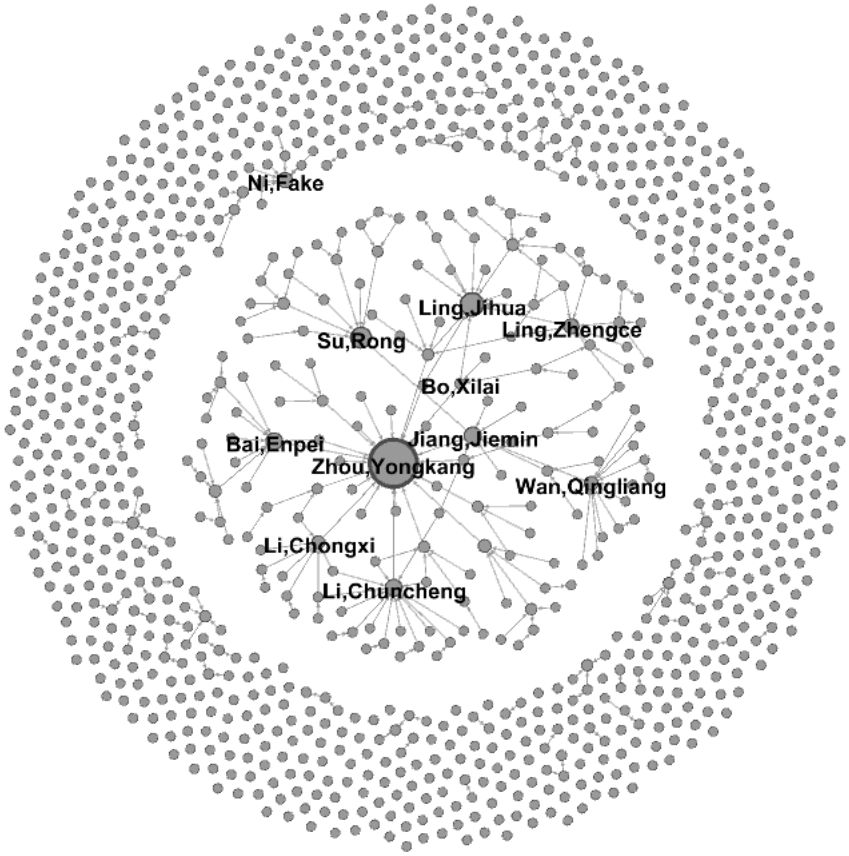

Figure 1: Network of Reported Political Connections Among Officials Indicted.
Sources: The Central Discipline Inspection Commission, other public documents and media.
Notes: A line connecting two dots represents a reported political connection and the arrows point upward from clients to patrons. The size of each node is determined by its rank in the network according to the PageRank algorithm (Brin and Page, 1998).

A striking feature of the diagram is the interconnected group in the center (162 observations), which is separated from those on the periphery (895 observations). The central group contains more high-ranking officials. Only four ranked at the governor/minister level fall on the periphery while twelve are connected to the central group. Only 3.7% of the indictments in the central group are of county-level officials while the corresponding percentage on the periphery is 17.8%. Moreover, the central group is composed of more governmental officials (89.5%) and fewer leaders from state-owned enterprises (9.3%) or other public institutions (1.3%). By comparison, only 76.2% of the nodes on the periphery are governmental officials.

Almost all of the most prominent victims of the crackdown are located within this central network. Table 1 lists the top players in this network, ordered by PageRank score. The

highest-ranked individuals in the network are Zhou Yongkang, the first member of China's ruling Politburo Standing Committee ever to be formally charged with corruption, Ling Jihua, close advisor of outgoing Party Secretary Hu Jintao and head of the Party's powerful General Office, and Su Rong, Jiangxi Province's Party Secretary and one of the 200-odd members of the Party's Central Committee. These three were widely viewed as the most important civilian "big tigers" netted in the first phase of the crackdown.[8]

Notably, another prominent official, Bo Xilai, ranks only 49th on this list. This is below not only these three big tigers but also a large number of other individuals in the network. Bo Xilai was a rising star who fell from grace after allegations against him and his wife by his police chief became global news. He was widely viewed as the only other person of Xi Jinping's generation who might have directly contended with him for leadership of the party. Like Xi, he is a "red princeling," son of Bo Yibo, one of the leading figures in the party from its time as a guerrilla movement through to the start of the post-Mao economic reform era. Both Bo and Xi had successful records serving at high levels of both provincial and central government bodies. In addition, Bo was noted for his personal charisma and for having introduced a distinctive set of policies and a populist governing style that were viewed as an alternative to the model pursued by most of the party's leaders. This almost resembled a competing political platform in a world where monotonous repetition of anodyne party-approved slogans is typical of even the most prominent central leaders. All of these facts were viewed as potentially setting him up not just to rise to the seven-member Politburo Standing Committee, but also as potentially giving him a power base that could have undermined Xi Jinping (Broadhurst and Wang, 2014).

It is therefore surprising that our network analysis assigns Bo a relatively low position. What this means concretely is that relatively few of his associates were brought up on charges in the course of the crackdown. While only suggestive, this goes against the idea of the crackdown as primarily a power consolidation move. Were Xi aiming to conclusively remove his greatest personal threat, we would have expected to see a root-and-branch purge of everyone who might have backed Bo (and who might want to help him come back to power in the future).

By contrast, the central figures of the crackdown, Zhou Yongkang, Ling Jihua, and Su Rong, were powerful but were not viewed as direct competitors with Xi for leadership of the party. Were they instead targeted for being notably corrupt, as the party claims?

[8] We exclude military leaders because very little information has been published on the crackdown within their ranks, aside from the highly public arraignment of General Xu Caihou.

Table 1: Highest-ranked officials in the indictment network [a]

Name	Network Rank	Notes
Zhou Yongkang	0.0487	Member of the 17th Politburo Standing Committee
Ling Jihua	0.0177	Chief of the CCP General Office between 2007 and 2012
Su Rong	0.0146	Vice-chairmen of the Chinese People's Political Consultative Conference
Jiang Jiemin	0.0102	Chairman of the China National Petroleum Corporation
Li Chuncheng	0.0099	Deputy Party Secretary of Sichuan Province
Bai Enpei	0.0096	Party Secretary of Yunnan Province
Ling Zhengce	0.0079	Vice-Chairman of the Shanxi People's Political Consultative Conference
Ni Fake	0.0078	Vice Governor of Anhui Province
Wan Qingliang	0.0061	Communist Party Secretary of Guangzhou City
Li Chongxi	0.0053	Chairman of the Sichuan People's Political Consultative Conference
(38 others)	...	...
Bo Xilai	0.0019	Communist Party Secretary of Chongqing Municipality

[a] *Source:* Author's calculation.

2.3 Was the corruption crackdown sincere? A first cut.

As a preliminary indicator, we use a small but easily available dataset to demonstrate that the crackdown indeed tended to hit harder in areas that were more corrupt. In 2012, on the eve of the crackdown, the World Bank surveyed 2700 privately owned firms in 23 cities. The survey asks respondents to rate the extent to which various factors pose an obstacle to business operation, on a 0-4 scale. We focus on three obstacles that should be associated with a more corrupt city: business licensing and permits, courts, and corruption itself. We take the simple average score of all respondents in the city as the measure of the significance of that obstacle in that city. Our dependent variable is the severity of the crackdown in a given city, based on the number of indictments of officials from that city recorded in our data.

We will make further use of this data below, but our objective at this point is just to test the face validity of the party's claim that the crackdown targeted corruption. To do so, we include each of the surveyed business obstacles one at a time in a simple OLS regression framework. We control for whether the city is a provincial capital or not, since the arrest of the higher-level leaders in these cities is more likely to be publicized. We do not include any other control variables because our goal is simply to demonstrate an association between the perception of corruption and the severity of the subsequent crackdown. Controlling for other factors that might cause or be associated with corruption would simply obscure this relationship.

Table 2 presents our results. Because our dependent variable is at the city level, our sample size is only 23. Nonetheless, a perception of greater business obstacles is positively associated with the severity of the subsequent crackdown in these cities. Note that each of the 12 coefficients on the table comes from a separate regression specification. All coefficient estimates are positive, although their significance levels vary depending on the measures used. Column 1 reports coefficient estimates using the simple count of the number of indictments, column 2 converts the dependent variable into deciles, column 3 logs the dependent variable, and column 4 drops an influential outlier.[9]

Figure 2 plots the relationship between corruption and indictments with the outlier dropped. While admittedly simple, this analysis lends credence to the CCP's claim that the crackdown was aimed at corruption. However, this evidence is only suggestive. Moreover, it does not help us directly evaluate why the three tigers were targeted, as only one of the cities surveyed had a strong connection to any of them. In the next section we pursue a different empirical strategy. This strategy provides more direct evidence that the tigers were targeted because of the role they had played in eroding the party's core meritocratic institutions.

[9] Guangzhou had relatively positive (low) responses to the four survey questions, but was hit hard in the crackdown, with 26 officials indicted. By comparison, the next hardest-hit city had only 18 indictments, and 74% (17) of the cities has 5 or fewer indictments. In the regression of corruption perception on absolute number of indictments Guangzhou has a studentized residual of 4.75, while all other cities have a studentized residual with an absolute value of less than 2. We therefore drop this observation in column 4.

Table 2: Relationships between corruption-related business obstacles in 2012 and post-2012 indictments [a]

To what degree is/are [OPTION] an obstacle to the current operations of this establishment?	D.V. Indictment Index			
	Raw Number	Deciles	Logs	Outlier Dropped
Business licensing and permits	5.201	5.080**	1.056**	7.234
	(4.044)	(1.961)	(0.498)	(4.487)
Courts	18.16**	13.02***	2.710***	16.69**
	(7.131)	(3.146)	(0.834)	(7.229)
Corruption	5.652	8.095***	1.403*	10.81*
	(7.181)	(2.664)	(0.750)	(5.715)
Observations			23	
Provincial capital dummy			Y	

[a] This table presents the key coefficients from 12 separate OLS regressions, each including only one obstacle as independent variable and one version of the indictment index as the dependent variable. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

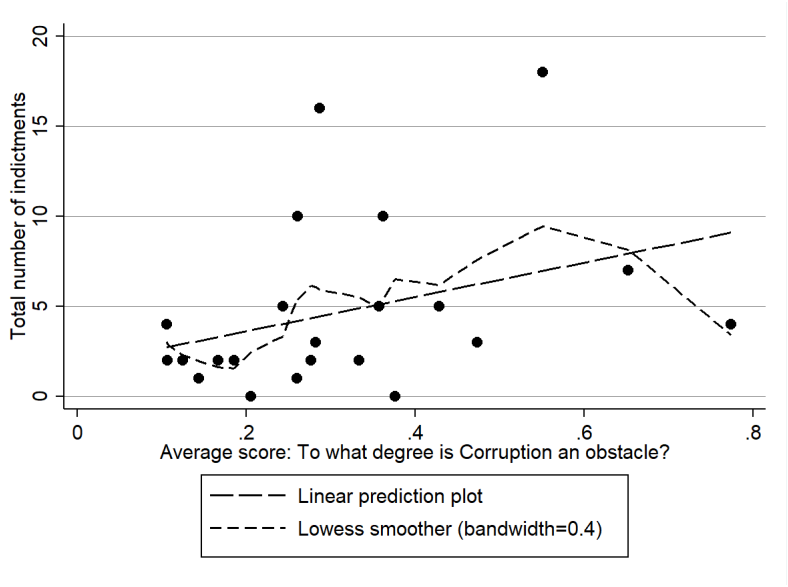

Figure 2: Relationship Between Firms' Corruption Perception in 2012 and Post-2012 Indictments.
Notes: This figure plots scores of "corruption as an obstacle" against the number of indictments with OLS regression line and Lowess curve. Data on perceived corruption comes from a 2012 World Bank survey of privately-owned firms in 23 Chinese cities. Influential outlier (Guangzhou) excluded.

3 Reasons for targeting the tigers

In this section, we will show evidence that in the years leading up to the 2012 appointment of the new Xi-led Politburo, the meritocratic promotion norms prevalent across the rest of China were undermined in the three provinces controlled by the three tigers Zhou, Ling, and Su. Specifically, in most of China, prefecture-level (city) leaders were more likely to be rewarded with promotion if their jurisdiction's GDP growth rate was larger than that of others in the same province during their tenure as leaders. In the three provinces where the tigers were viewed as having strong power bases (we will call them tiger territories for convenience) there is no such relationship. Similarly, in most of China certain professional backgrounds and experiences normally mean a higher probability of promotion because they indicate that the official is viewed as a talented up-and-comer who is being groomed for higher office. In the tiger territories, these backgrounds did not seem to help.

Non-meritocratic promotion does not just represent a failure to live up to ideals of efficient bureaucratic governance. Throughout China there were reports of the officials using bribery to advance in the hierarchy, and of other officials growing wealthy through outright sale of public office (Osnos, 2014; Tsai and Kou, 2015). While we do not observe these payments directly in our data, we find evidence consistent with the view that officials in these tiger territories were promoted primarily depending on how well they played along with pervasive corruption. In these three provinces, the more corrupt a city was, the more likely its leader was to be promoted.

3.1 Institutional Context: Promotion and meritocracy in China's political system

In addition to making greater use of market mechanisms, one of Deng Xiaoping's key innovations as he led the country away from Mao's catastrophic reign was to strengthen the CCP as a governing institution. At the top of the system, gerontocratic revolutionaries who had clung to power even as their faculties diminished were sidelined, clearing the way for new elites to reinvigorate CCP rule. In the middle stratum of bureaucratic functionaries, the politicized and unpredictable paths to power that had prevailed under Mao's chaotic reign were replaced by a clearer career path that identified and rewarded competence in carrying out the party's objectives. And at the lowest levels, recruitment into the party was systematized and strengthened through a revived Youth League that sought out promising talent and offered them a career path regardless of their family background. These changes improved the quality of governance and facilitated China's rapid economic development.

The career incentives of Chinese officials have been researched intensively. The party maintains an elaborate performance evaluation system that scores officials on a number of different dimensions (Edin, 2003; Whiting, 2001). The primary reward for performance is promotion to a higher level of the hierarchy, generating mostly-beneficial tournament-style competition among officials (Maskin et al., 2000; Xu, 2011) . This promotion system applies to all of Chinese officialdom but is most easily studied in the context of local government leaders. Although they are rated on many dimensions, it has been widely understood (and is readily admitted by most officials) that economic performance takes precedence over softer goals. Publicly available economic data therefore lets us assess whether promotion

patterns are consistent with meritocratic criteria. Studies evaluating promotion patterns among local government officials have found that better economic performance, especially a higher GDP growth rate, is indeed associated with a greater possibility of being promoted (Li and Zhou, 2005; Chen et al., 2005; Choi, 2012). These associations generally appear to be stronger the lower an individual is in the hierarchy, with the associations clearest at the county level (Chen and Kung, 2016; Landry et al., 2017) and less clear at or above the provincial level (Tao et al., 2010; Shih et al., 2012; Arcand et al., 2014), although see (Jia et al., 2015).

A less widely-researched but equally important element of this system is the way in which it identifies, recruits, and trains talented individuals. Doing this well helps it to maintain its own organizational strength as well as co-opting those who might otherwise become opponents of the regime (Svolik, 2012). The party has always made this a priority, striving to identify talented and committed activists as early as possible, with most members joining by their early twenties (Walder, 2015). Moreover, party membership has been a coveted prize, offering a path to career advancement and valuable connections. Even within the party, selection and training are central concerns, with an elaborate system for maintaining secret lists of "reserve cadres" at each level of government viewed as likely candidates for promotion (Tsai and Kou, 2015), as well as a nationwide network of party schools meant to identify and indoctrinate talented and loyal mid-career officials (Lee, 2013).

One of the major channels of recruitment has been the Communist Youth League (CYL). Almost every party member first joins the CYL. The best of this crop of young people are retained to stay within the CYL as adults for a few years as full-time employees in leadership roles. Being chosen for such a role and rising within the leadership ranks of the CYL has been a fast track to the top since the 1990s. CYL leadership alumni are generally much younger than other officials at the same level of the party-state hierarchy (Kou and Tsai, 2014). Moreover, its leaders tend to come from relatively underprivileged backgrounds with weaker family ties to the party elites, making it an important tool for refreshing the party's talent pool and for ensuring that people with political leadership skills see their future within the party rather than in opposition to it.

Another opportunity for talented officials to get on the fast track is to get work experience and demonstrate their competence in offices at a higher level of the party-state. Individuals who have experience both as a leader in local level government and as an assistant or team member in the bureaucracy at higher levels are viewed as being better prepared for further promotions. Research on prefectural-level (city) leaders has found that they are more likely to be promoted if they have worked at the provincial level prior to their local-level appointment (Kou and Tsai, 2014; Arcand et al., 2014; Yao and Zhang, 2015). These work experiences are analogous to on-the-job training and rotation programs widely adopted by private firms. These programs are thought not only to increase labor productivity (Becker, 1962; Bartel, 1995; Acemoglu and Pischke, 1999), but also to reduce asymmetric information by allowing employers to learn more about workers' strengths (Ortega, 2001; Eriksson and Ortega, 2006)

Some studies interpret these patterns of promotion as reflecting clientelistic or factional networks. Analysts of Chinese politics sometimes refer to a "Youth League Faction" said to be in conflict with a "Princeling" faction made up of the privileged descendants of past leaders, or a "Shanghai Gang" based on past work experience in Shanghai (Shih et al., 2012;

Arcand et al., 2014; Francois et al., 2018). While we cannot rule this out as a contributing factor, the evidence is mostly circumstantial, leading even insider analysts to disagree about whether CYL alumni indeed behave as a coherent faction. The most compelling evidence comes from Francois et al. (2018) who present evidence at the elite level of China's Central Committee (roughly 400 people) that when the ruling General Secretary has been from the CYL, other CYL members are more likely to be promoted. However, this does not contradict the idea that CYL leadership alumni also do well on average for meritocratic reasons, irrespective of the current top leadership. Because the CYL was explicitly designed as a mechanism to give talented young people early experience in leadership roles, it would be remarkable if its alumni failed to outperform their peers.

3.2 Dataset

Following previous studies of meritocracy in China, we will focus on sub-national government leaders for whom more performance data is publicly available. The three big tigers had networks of influence that stretched through a number of different arms of the party-state,[10] but each had a province where his influence in local government was understood to be particularly strong. Su Rong was the Party Secretary of Jiangxi Province from 2007-2012. Zhou Yongkang is associated with Sichuan, where he served as Party Secretary for three years and maintained close ties even after being promoted to the central government level. Seven of his closest collaborators there have been indicted in the anti-corruption campaign and explicitly linked to him. Ling Jihua worked in his home province of Shanxi only very early in his career before moving to Beijing in 1979, at age 23, building his career in the central government thereafter. However, he was widely understood to have maintained close links with associates there (Li, 2014).

These three provinces were also hardest hit by the first wave of the anti-corruption campaign that we study. Figure 3 ranks the provinces according to their number of province-level indictments. Jiangxi, Sichuan, and Shanxi clearly stand above the others. In the network diagram of Figure 1 shown earlier, about 60% of the indicted individuals whose last position was in one of these three provinces can be found in the central cluster, and over half of the individuals in that cluster had worked in one of those three provinces.

[10] Zhou Yongkang spent decades in the state-controlled petroleum sector, and led the Ministry of Public Security before joining the Politburo Standing Committee with control of the law enforcement portfolio. Ling Jihua spent most of his career in Beijing, holding key positions in the Communist Youth League and the party's General Office. Su Rong was party secretary of Qinghai and Gansu provinces and was vice president of the Central Party School in Beijing.

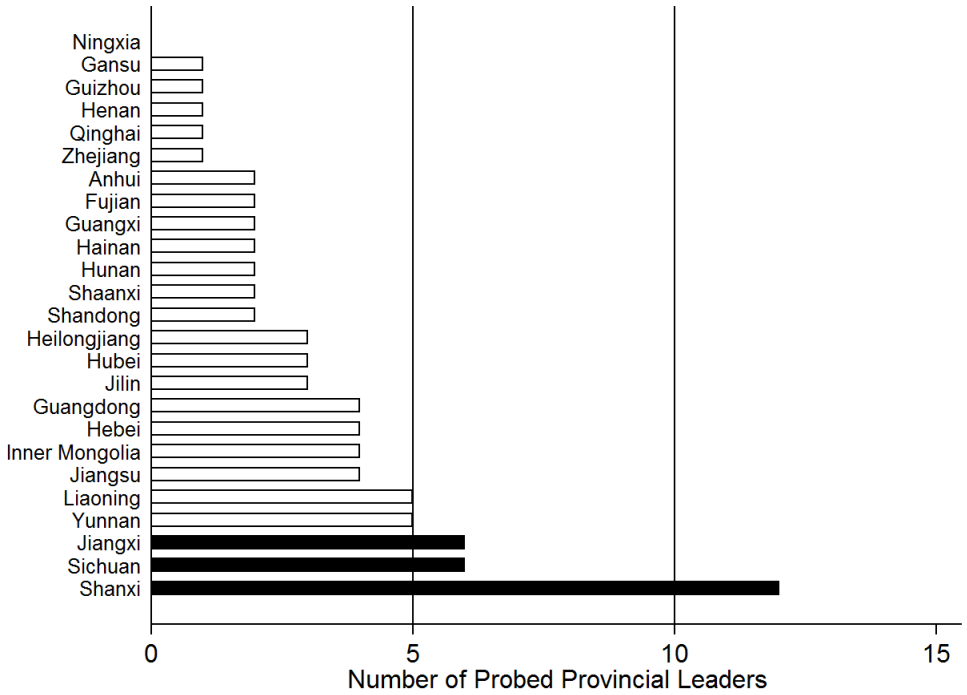

Figure 3: Number of Indicted Officials at the Provincial Level.
Source: The Central Discipline Inspection Commission. *Notes:* This figure arranges the provinces in order of the number of indicted provincial leaders. Jiangxi, Sichuan, and Jilin, the tiger territories, have more indictments than other provinces.

We therefore investigate the differences in promotion practices between these three provinces and the rest of China, where the initial phase of the corruption crackdown was less intense. To do this we assembled a dataset of all prefecture-level officials serving between 2006 and 2012. Essentially, these are the mayors and party secretaries of every city in China.[11] We chose 2006 to 2012 as this is the period just before Xi Jinping took power and launched the anti-corruption campaign. During these years the three tigers each held top leadership positions: Zhou Yongkang was a member of the Politburo Standing Committee with responsibility for the security apparatus and the legal system, Ling Jihua was the director of the General Office of the CCP Central Committee, a role with crucial gatekeeping power, and Su Rong was the party secretary of Jiangxi province.[12]

One observation in our dataset is the end-of-term fate of one official who held a prefecture-level posting during this period.[13] We eliminate terms of service that began before 2006 or

[11] We exclude the cities of Beijing, Shanghai, Tianjin, and Chongqing, as they are treated as province-level in the Chinese government. The provinces of Xinjiang and Xizang (Tibet) were also not included due to a lack of available socio-economic data.

[12] The networks of the three tigers were thus not exclusively among officials in provincial and sub-provincial governments with economic development responsibilities. We focus on these in order to have a consistent standard for measuring good job performance based on publicly available data.

[13] A city leader was allowed to appear repeatedly in our data if he or she served multiple complete terms in different positions. For example, a city leader shows up twice in our data if he or she was a mayor between

ended after 2012. Terms are limited to five years, but in practice they usually end before this limit with the transfer of the official to a new post. To measure economic performance, we average the annual GDP growth rate over the years in the leader's term and compare it with that of peers in the same province.

Promotion for a city leader is defined as a change in administrative rank when his term ends. For example, if a city leader is moved to a sub-provincial or a higher-level unit, it is considered a promotion. In addition, moving from mayor to party secretary is considered a promotion even though it does not involve a change in administrative rank. We also count as promoted six city leaders who were selected in 2010 to assume posts in central ministries.

Following previous literature, we include controls for several biographical variables expected to affect promotion odds, gathered from online curriculum vitae (Li and Zhou, 2005; Jia et al., 2015; Chen and Kung, 2016). Age is the most straightforward: experience is valued but party policy explicitly restricts individuals from being promoted if they exceed a maximum age, and in practice younger individuals tend to be favored (Kou and Tsai, 2014). Tenure (time in the post) is important: promotions tends to occur later in a term of service (Chen and Kung, 2016). We also include a dummy variable for whether the city is a provincial capital and therefore considered to be a more prestigious posting than other prefectures.

In addition, we will address the possibility that the variables we consider might also be correlated with personal connections — individuals with the right networks might be assigned to localities expected to grow relatively rapidly (Shih et al., 2012) or get easily promoted back to the capital despite poor economic performance because of their connections, not their perceived ability.[14] To proxy for such connections, we use three indicators of shared background introduced by Shih et al. (2010) and used since then by most studies of personal ties in China (Shih et al., 2012; Jia et al., 2015; Fisman et al., 2017).[15] Based on publicly available biographic data, these indicate for each prefectural official whether he or she has possible ties with anyone who was a member of that province's Politburo Standing Committee at the time of his promotion. These ties include having been born in the same prefecture (hometown ties, *tongxiang*), having graduated from the same university (school ties, *tongxue*), and having worked in the same governmental unit at the same time (workplace ties, *tongshi*). Table 3 provides summary statistics, separating city leaders in the tiger territories from those in the rest of China. The p-values from the two-sample t-test are listed in the last column. The promotion rate in the tiger territories was lower by 10%. Except for gender and overlapping work experience with PPSC members, there is no significant difference between the two groups of provincial officials in other variables.

2007 and 2009 and then became a mayor in another city between 2009 and 2011. Or he could be the party secretary in any city after 2009 as long as the second term finished no later than 2012.

[14] Although as Jia et al. (2015) note, personal connections also enhance the quality of information about a promotion candidate to superiors, which may contribute to promotion even when selecting competent officials is the only objective.

[15] Recent studies have argued for the use of stricter criteria of workplace overlap (Jiang, 2018; Keller, 2016)

Table 3: Summary Statistics for Prefectural-Level Leaders (2006 -2012, Position-Based) [a]

	Group I Tiger Territories (n=84)		Group II Other Provinces (n=465)		
Variables	Mean	Std. Dev.	Mean	Std. Dev.	P-value
Age (age at the end of term)	52.86	3.527	52.24	4.220	0.205
Tenure (term length in months)	36.33	15.89	36.27	16.01	0.974
Gender (1=male; 0=female)	0.857	0.352	0.948	0.221	0.002
Position (1=prefectural party secretary; 0=city mayor)	0.476	0.502	0.439	0.497	0.526
Promotion (1=yes; 0=no)	0.464	0.502	0.566	0.496	0.086
Relative GDP growth rate	0.131	1.041	-0.025	1.442	0.343
Worked for the Provincial General Office	0.131	0.339	0.153	0.360	0.608
Worked for other province-level units	0.429	0.498	0.368	0.483	0.291
Background in the Youth League at provincial level or above	0.119	0.326	0.120	0.326	0.972
Corruption intensity	1.988	1.904	1.910	2.914	0.812
Corruption intensity (city leaders excluded)	1.833	1.741	1.806	2.893	0.934
School ties (*tongxue*) with *any* Provincial PSC member	0.345	0.478	0.271	0.445	0.165
Hometown ties (*tongxiang*, same city) with *any* Provincial PSC member	0.333	0.474	0.258	0.438	0.153
Work ties (*tongshi*) with *any* Provincial PSC member	0.631	0.485	0.505	0.501	0.034

[a] This table shows the summary statistics of demographics, career experience, personal ties and local economic growth for prefectural-level (city) leaders. Group I contains the provinces of Sichuan, Shanxi and Jiangxi ("tiger territories"). Beijing, Shanghai, Tianjin, Chongqing (the directly-controlled municipalities), Xinjiang and Xizang (Tibet) are excluded. The sample contains only the city leaders who served full terms between 2006 and 2012. Different positions of the same officials are treated as separate observations. The p-value from the two-sample t test is listed in the last column.

3.3 Empirical Estimates

Figure 4 illustrates the different relationships of growth with promotion in the two groups of provinces using a LOWESS curve. In the tiger territories promotion probability appears to decrease as relative GDP growth increases. By contrast, in the rest of China higher relative GDP growth rates are associated with higher promotion odds, consistent with the idea that promotion followed a meritocratic logic.

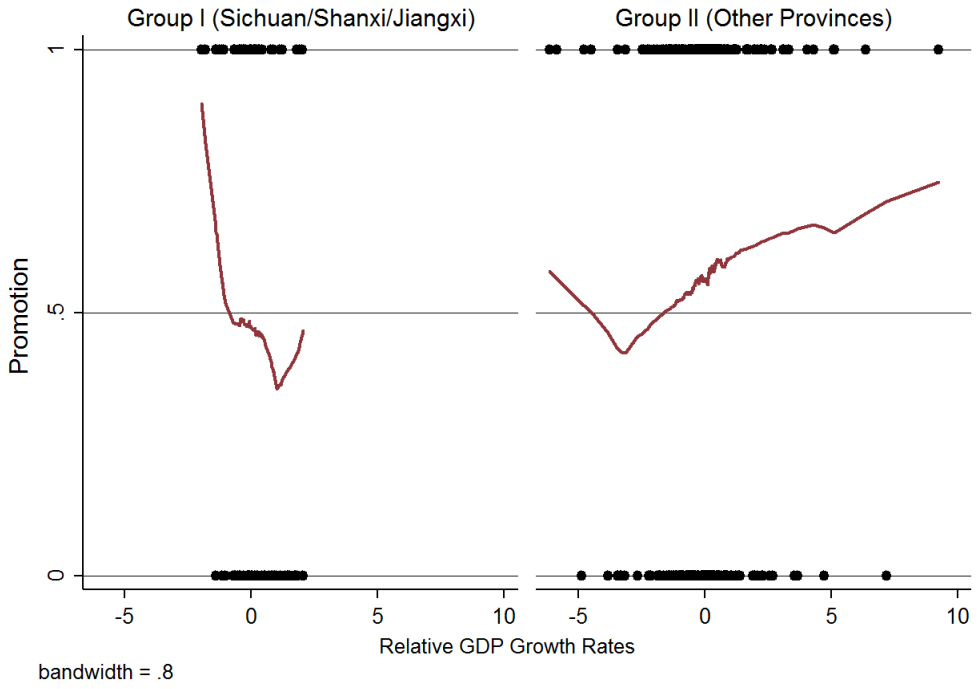

Figure 4: Promotion Odds and Relative GDP Growth Rates.
Notes: This figure illustrates lowess-smoothed relationship for the two groups of provinces. Bandwidth is 0.8. Before the anti-corruption campaign, in the tiger territories (Group I), the likelihood of promotion and relative GDP performance were negatively related. By contrast, in all other provinces (Group II) higher GDP growth rates led to higher promotion odds.

To compare the promotion patterns between the tiger territories and the rest more systematically, we follow the literature in using a simple linear probability model:

$$promotion_i = \alpha_0 X_i + \alpha_1 G_i + \alpha_2 X_i * G_i + \delta Z_i + \psi \mu_p + \varepsilon_i$$

$promotion_i$ is a binary variable that equals one if the ith turnover in the sample meets our definition of promotion; otherwise, it equals zero. X_i represents variables intended to capture meritocratic promotion criteria, including higher GDP growth rates and fast-track backgrounds. G_i is a binary variable that equals one if the ith observation comes from a tiger territory and zero otherwise. To compare the promotion patterns between groups, we generate an interaction term by multiplying the merit variable by the tiger territory

indicator ($X_i * G_i$). If α_2 is significantly negative, this implies that promotions in the tiger territories did not adhere to meritocratic standards as tightly as in the rest of China. Z_i is the set of control variables that have been found in previous literature to affect promotion odds, including age, gender, term length (tenure), position type (Party Secretary or city mayor), city level,[16] and μ_p a province-level fixed effect. ε_i is the error term.

Table 4 uses several different approaches to compare factors associated with promotion between the tiger territories and other provinces. We first introduce meritocratic backgrounds: column 1 shows in a regression with only basic controls that prior work experience in the provincial general office is associated with promotion. The estimated effects of experience in other provincial departments or in the provincial CYL are also positive but smaller in magnitude and not statistically significant. Column 2 interacts these variables with a dummy variable that takes the value of 1 in the three tiger territories. This increases the estimated magnitude of the effects in the rest of the country, while showing that in the tiger territories, the net effect of these fast-track backgrounds is zero or negative. In column 3, we see that relative GDP growth has a positive but non-significant association with promotion across the whole sample. Column 4, however, shows that this relationship becomes larger in magnitude and statistically significant once we exclude the tiger territories, and that the relationship between relative GDP performance and promotion was significantly attenuated or negative in the tiger territories. Each of these results points in the same direction: Meritocratic criteria for promotion that seemed to apply elsewhere in China were disregarded in the three tiger provinces.

Table 5 shows that controlling for school, hometown, or work ties does not change our conclusions, nor do we find any significant relationships between these ties and promotion, with one exception. Column 1 provides a sparse specification — just the three possible ties and our controls. The ties do not have any significant association with promotion. Column 2 then interacts the three types of tie with our tiger territory dummy. This also yields no significant relationships, although some of the estimated magnitudes are large. Finally, in column 3 we include all the variables from the full specification in Table 4, column 4. Interestingly, the interaction term for school ties is positive and statistically significant, implying that in the tiger territories these ties may have helped advancement. This is consistent with our general conclusion that these provinces were less meritocratic, although it is not central to our argument. Most important, however, is the fact that even with all of these controls for personal ties our coefficient estimates are essentially unchanged relative to Table 4, column 4. Thus, personal ties do not appear to be an important omitted variable.

Having provided evidence that promotion in the tiger territories did not follow the meritocratic patterns evident in the rest of the country, we now present evidence that what *did* help promotion was corruption. To test this hypothesis, we use the same indictment data that went into Table 2 to create a corruption intensity index for each city. Recall that earlier we found an association between the World Bank's survey indicators of corruption and the number of later indictments in a city. For the corruption index we use here, we count the number of indictments of individuals who served concurrently with a particular leader in order to focus on the level of corruption during that leader's term of office. We do not count the leader himself in order to avoid the reverse causality problem that would

[16] City level is a dummy variable. It equals one if the city is a provincial capital; otherwise, it equals zero.

Table 4: Promotion patterns at the prefectural level [a]

	D.V. Promotion (1=Yes; 0=No)			
	(1)	(2)	(3)	(4)
Provincial General Office	0.156**	0.214***	0.208***	0.207***
	(0.0732)	(0.0711)	(0.0710)	(0.0709)
Other provincial departments	0.0709	0.0901*	0.0887*	0.0891*
	(0.0455)	(0.0510)	(0.0501)	(0.0498)
Provincial Communist Youth League (CYL)	0.0466	0.0873	0.0845	0.0850
	(0.0772)	(0.0903)	(0.0891)	(0.0888)
Tiger territories * Provincial General Office		-0.550***	-0.556***	-0.560***
		(0.166)	(0.171)	(0.160)
Tiger territories * Other provincial departments		-0.235***	-0.249***	-0.245***
		(0.0603)	(0.0552)	(0.0585)
Tiger territories * Provincial CYL		-0.414*	-0.415*	-0.471**
		(0.206)	(0.215)	(0.207)
Relative GDP growth rate			0.0182	0.0243**
			(0.0114)	(0.0114)
Tiger territories * Relative GDP growth rate				-0.0875**
				(0.0352)
Control variables	Y	Y	Y	Y
Provincial FE	Y	Y	Y	Y
Observations	549	549	548	548
R-squared	0.188	0.206	0.208	0.212

[a] Control variables are ln(age), squared ln(age), gender, ln(tenure), positions (prefectural party secretary or mayor), and the dummy of provincial capital city. The prefectural city of Aba(zhou) is dropped from the sample in columns (3) and (4) because the 2008 Sichuan earthquake was a major negative shock to its GDP. Robust standard errors are in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Promotion patterns at the prefectural level with individual connections [a]

	D.V. Promotion (1=Yes; 0=No)		
	(1)	(2)	(3)
School ties (*tongxue*)	-0.0131	-0.0322	-0.0450
	(0.0482)	(0.0556)	(0.0579)
Hometown ties (*tongxiang*, same city)	-0.00591	-0.0273	-0.0350
	(0.0477)	(0.0545)	(0.0466)
Work ties (*tongshi*)	0.0469	0.0725	0.0477
	(0.0507)	(0.0535)	(0.0528)
Tiger territories * School ties		0.0931	0.167**
		(0.0640)	(0.0777)
Tiger territories * Hometown ties		0.136	0.0797
		(0.0910)	(0.0694)
Tiger territories * Work ties		-0.162	-0.0885
		(0.105)	(0.0976)
Provincial General Office			0.200***
			(0.0680)
Other provincial departments			0.0964*
			(0.0477)
Provincial Communist Youth League (CYL)			0.0806
			(0.0898)
Relative GDP growth rate			0.0232*
			(0.0122)
Tiger territories * Provincial General Office			-0.566***
			(0.185)
Tiger territories * Other provincial departments			-0.245***
			(0.0799)
Tiger territories * Provincial CYL			-0.469*
			(0.231)
Tiger territories * Relative GDP growth rate			-0.0792**
			(0.0294)
Control variables	Y	Y	Y
Provincial FE	Y	Y	Y
Observations	549	549	548
R-squared	0.179	0.184	0.217

[a] Control variables are ln(age), squared ln(age), gender, ln(tenure), positions (prefectural party secretary or mayor), and the dummy of provincial capital city. The prefectural city of Aba(zhou) is dropped from the sample in columns (3) and (4) because the 2008 Sichuan earthquake was a major negative shock to its GDP. Robust standard errors in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

result if getting promoted affected the likelihood a leader would be investigated.

In Table 6, we see that corruption intensity is a statistically significant predictor of promotion in the tiger territories but not elsewhere in China. Column 1 includes only basic controls and finds no association across all prefectures. Column 2 includes an interaction term for tiger territories, which shows that the almost-zero relationship in other provinces is instead significant in these three provinces. Column 3 includes the complete set of variables used in the analysis of Table 4 and gets the same result. That is, in the tiger territories individuals surrounded by corruption advanced more rapidly, regardless of whether they personally were indicted. Again, this relationship did not hold in the rest of China. Inclusion of this corruption intensity index also does not notably change the magnitudes or standard errors of our meritocracy estimates from Table 4.

Table 7 summarizes the contrast between the two groups of provinces. In most provinces, economic performance and a fast-track professional background were associated with a greater likelihood of promotion. In the tiger territories they did not help and may have even hurt. By contrast, higher levels of corruption had no effect on the likelihood of promotion in the most provinces, but they did in the tiger territories. Thus, it appears that while most provinces rewarded performance and pedigree, in the provinces of Sichuan, Shanxi, and Jiangxi promotion became divorced from both. Instead, the best path to promotion was enthusiastic participation in or at least toleration of corruption. This suggests that a key factor leading to the purge of the tiger's networks in these three provinces was their departure from existing norms within the Party.

3.4 Problematic Promotions as Cause for Investigation

Having found evidence that promotion patterns in three of the provinces most heavily targeted by the crackdown appeared to be based on non-meritocratic criteria, we now show directly that non-meritocratic promotions are associated with a higher likelihood of indictments. Using the same population of prefecture-level leaders, we show that officials whose promotions in the pre-Xi period of 2006-12 appear to violate meritocratic norms were more likely to be targeted in the subsequent crackdown. This supports the view that a major goal of the crackdown was to rein in selling of offices or other forms of collusion between the mid-ranked principals managing the tournaments at the provincial level and the agents they were evaluating.

We define a problematic promotion as one where the promoted official did not have a fast-track background and showed poor relative economic performance. We define fast-track background as work experience in the provincial general office, the most robust fast-track predictor in our earlier analysis. We define poor economic performance as a relative GDP growth rate below the $40th$ percentile. Approximately 55% of prefecture-level officials were promoted, so someone below this percentile would have been promoted over competitors with a stronger record of performance.

$$Indict_{ip} = \theta_1 PROB_i + \theta_2 promotion_i + \theta_3 PROB_i * promotion_i + \delta Z_i + \psi\mu_p + \varepsilon_i$$

The dependent variable $Indict_ip$ is a binary variable that equals one if the ith city leader of province p has been indicted. As before, $promotion_i$ is a binary variable indicating whether city leader i was promoted out of his current job.

Table 6: Promotion patterns at the prefectural-level with corruption intensity [a]

	D.V. Promotion (1=Yes; 0=No)		
	(1)	(2)	(3)
Corruption intensity (city leaders excluded)	0.00959	0.00582	0.00399
	(0.0141)	(0.0137)	(0.0128)
Tiger territories * Corruption intensity (city leaders excluded)		0.0507*	0.0690**
		(0.0277)	(0.0285)
Provincial General Office			0.205***
			(0.0580)
Other provincial departments			0.0883*
			(0.0481)
Provincial Communist Youth League (CYL)			0.0811
			(0.0692)
Relative GDP growth rate			0.0244*
			(0.0145)
Tiger territories * Provincial General Office			-0.485***
			(0.163)
Tiger territories * Other provincial departments			-0.242*
			(0.144)
Tiger territories * Provincial CYL			-0.551***
			(0.157)
Tiger territories * Relative GDP growth rate			-0.119**
			(0.0501)
Control variables	Y	Y	Y
Provincial FE	Y	Y	Y
Observations	549	549	548
R-squared	0.178	0.182	0.219

[a] Control variables are ln(age), squared ln(age), gender, ln(tenure), positions (prefectural party secretary or mayor), and the dummy of provincial capital city. The prefectural city of Aba(zhou) is dropped from the sample in columns (3) and (4) because the 2008 Sichuan earthquake was a major negative shock to its GDP. Robust standard errors in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Summary of the differences in promotion patterns [a]

	Correlation with Promotion Odds	
	Group I Tiger Territories	Group II Other Provinces
Relative GDP growth rate	Negative	Positive
Specific working backgrounds	Negative	Positive
Corruption intensity	Positive	No effects

[a] Group I contains the provinces of Sichuan, Shanxi and Jiangxi (tiger territories). Beijing, Shanghai, Tianjin, Chongqing (the directly-controlled municipalities), Xinjiang and Xizang (Tibet) are excluded from the sample.

$PROB_i$ is a dummy that equals one if the city leader satisfies both conditions by receiving a promotion without an obvious meritocratic justification (i.e., the promotion was problematic). θ_3 measures the pure effect of unexpected promotion on the likelihood of indictment odds. As in our earlier analyses, Z_i is a set of controls of individual characteristics that might also affect an individual's propensity to engage in corruption or likelihood of being investigated, including age, gender, tenure, party post, or assignment to the provincial capital. μ_p is the provincial fixed effect.

Our sample continues to be the population of city-level leaders examined throughout this section, with one change. Because the dependent variable of coming under investigation occurs only once for each individual, our observations have to be individuals rather than terms of office. For city leaders who appear more than once in our sample, we use their first position. Summary statistics are presented in Table 8.

Table 8: Summary Statistics for Prefectural-Level Leaders (2006 -2012, Individual-Based) [a]

	Group I Tiger Territories (n=70)		Group II Other Provinces (n=416)		
Variables	Mean	Std. Dev.	Mean	Std. Dev.	P-value
Age (age at the end of term)	52.771	3.502	52.187	4.266	0.278
Tenure (term length, in months)	36.371	16.50	37.293	16.01	0.657
Gender (1=male; 0=female)	0.871	0.337	0.950	0.219	0.012
Positions (1=prefectural party secretary; 0=city mayor)	0.443	0.500	0.399	0.490	0.497
Indicted in the first anti-corruption wave (1=yes; 0=no)	0.157	0.367	0.106	0.308	0.210
Relative GDP growth rate	0.148	0.988	-0.023	1.457	0.345
Worked for the Provincial General Office (1=yes; 0=no)	0.143	0.352	0.144	0.352	0.976
Corruption intensity	1.743	1.742	1.815	2.992	0.845

[a] This table shows the summary statistics of demographics, career experience, personal ties and local economic growth for prefectural-level (city) leaders. Beijing, Shanghai, Tianjin, Chongqing (the province-level municipalities), Xinjiang and Xizang (Tibet) are not included. The sample contains only the city leaders who served full terms between 2006 and 2012. For the officials who served for more than one positions, only the first position is counted. The p-value from the two-sample t test is listed in the last column. Aba (zhou) is excluded due to the 2008 Sichuan earthquake.

Table 9 presents our findings. The results are similar both in a bare-bones specification and with controls. First, the coefficient on promotion is negative, although not significantly so. Recalling that the specifications both include the interaction term, this suggests that promotion itself is not dangerous for individuals who either demonstrated good economic performance (above the $40th$ percentile for that province) or had province-level experience before being sent to work at the prefectural level. Similarly, the coefficient on non-meritocratic is negative on its own, implying that individuals who lacked province-level work experience and performed badly were not disproportionately targeted by the crackdown, as long as they were not promoted. The positive coefficient on the interaction term promotion*non-meritocratic, however, shows that individuals who received promotions that would not have been expected given their performance and previous background were more likely to become the subject of later investigations. This supports the idea that they got ahead through illicit means, either by colluding in the corrupt acts of their superiors or by purchasing their promotions outright. In either case, these findings reinforce our conclusion that a major objective of the corruption crackdown was to reinforce meritocratic promotion standards.

4 Personal ties and likelihood of indictment

The previous section provided evidence that the crackdown was aimed at officials and regions associated with corruption and non-meritocratic promotions. In this section, we examine the power consolidation argument by testing whether personal connections to the new leadership provided protection from investigation. Our dataset consists of all top province-level officials from 2012, just before Xi Jinping took power. We find four things, which are consistent with the widespread characterization of the corruption crackdown as a political consolidation aimed at centralizing power in Xi's hands. First, none of these officials were investigated if they had home, workplace, or school ties with Xi. Second, combining our corruption network data with other biographical data we find that home and workplace ties are good proxies for actual connections, but school ties may not be. Third, we show that individuals with connections to the three big tigers were disproportionately likely to be investigated. Fourth, we show that there was no apparent protective effect of connections to any of the other six members of the national Politburo Standing Committee. These findings do not contradict the evidence already provided that the crackdown targeted the most corrupt, but they do suggest at a minimum that Xi was careful not to undermine his own base of support by removing his followers from power.

4.1 Sample population and data

Our sample is the set of all members of the Provincial Politburo Standing Committees (PPSC). Each PPSC is made up of roughly a dozen people who hold of the most powerful party and government posts of a province, including the party secretary, the governor, and the head of the provincial party's discipline inspection commission. We include all individuals who served on these committees in the year 2012 between January and the national party congress in November, when Xi Jinping was officially anointed as China's leader. They thus represent a broad cross-section of China's province-level elites just before

Table 9: Probability of being indicted after 2012 and non-meritocratic promotions [a]

	D.V. Being Indicted (1=Yes; 0=No)			
	(1)	(2)	(3)	(4)
Promotion	-0.0198	-0.0131	-0.00641	0.00247
	(0.0375)	(0.0373)	(0.0333)	(0.0328)
Non-meritocratic	-0.0440	-0.0471	-0.0346	-0.0352
	(0.0435)	(0.0437)	(0.0497)	(0.0506)
Promotion* Non-meritocratic	0.122*	0.130**	0.134*	0.131*
	(0.0646)	(0.0645)	(0.0768)	(0.0772)
Ln(age)		0.0127		0.00386
		(0.202)		(0.206)
Gender		0.0934**		0.0898**
		(0.0373)		(0.0371)
Ln(tenure)		0.0594**		0.0560*
		(0.0301)		(0.0299)
Positions		-0.000941		-0.00245
		(0.0311)		(0.0311)
Provincial capital city		0.0724		0.0726
		(0.0701)		(0.0709)
Provincial FE	Y	Y	Y	Y
Observations	486	486	486	486
R-squared	0.058	0.076	0.059	0.075

[a] Non-meritocratic defined in columns (1) and (2) as relative GDP growth rate below the 40th percentile of the entire sample and the official did not work for the provincial General Office. Non-meritocratic defined in columns (3) and (4) as relative GDP growth rate below the 25th percentile of the entire sample and the official did not work for the provincial General Office. For city leaders who appear more than once in our sample, we consider their first position to avoid duplications. The prefectural city of Aba(zhou) is dropped from the sample for the Sichuan Earthquake in 2008 drastically pulled down its GDP. Robust standard errors in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

the crackdown began. This procedure gives us a total of 322 people, of whom 27 were indicted in the first wave of the crackdown.

For each PPSC official, we use biographical information to code their potential ties with ten crucial top officials. The first group is the big tigers, Zhou Yongkang, Su Rong, and Ling Jihua. The second is the seven members of the Central Politburo Standing Committee (CPSC) who took power in November 2012. The members of the CPSC are universally acknowledged to be the most powerful people in Chinese politics. The 2012-2017 CPSC included CCP General Secretary and PRC President Xi Jinping, Premier Li Keqiang, the head of the CCP's Central Committee on Discipline and Inspection Wang Qishan, and other officials with high ranks in the party apparatus (and typically the state as well). School ties and workplace ties are coded the same as before, but in this national context home ties are viewed more broadly to include individuals born in the same province, not just the same hometown.[17] We also collect information on control variables including age, administrative rank, central-level work experience, and experience working in state-owned industry. Summary statistics are provided in Table 10.

4.2 Econometric Approach

The first finding is so straightforward that purely descriptive statistics suffice. None of the 27 indictees had any potential connection to Xi, as Table 11 shows. This is highly unlikely to be result of random chance — Fisher's exact test assigns this outcome a probability of 0.034 under the null hypothesis that the indictment rates were identical for both groups.

To investigate more deeply, we take advantage of our data on the actual connections revealed between arrested officials, combining that with our other biographical data and the indications of potential connections we have for every official. Each measure of connections is imperfect. The data on potential connections resulting from school ties, home ties, and work ties is comprehensive, but these are only proxies capturing opportunities for two officials to connect, not actual relationships. We have greater confidence that the information about connections among indicted officials that we collected is accurate, but it is not comprehensive. We also cannot naively merge these two measures of connections. Recall that in our indictment network data, we only observe connections under two conditions: (1) the connection is strong enough and (2) both sides of the connection are indicted. To address this problem without abandoning the information contained in either type of data, we develop a recursive selection model. As a side benefit, this approach provides an assessment of the predictive power of these widely-used proxies for political connections.

Let y_{1i}^* be the latent variable representing the strength of the connection between an official i and a big tiger. This is a function of vector X_1, our set of measures of shared background (potential ties) between the official and any of the big tigers, plus noise $\varepsilon_{1i} \sim N(0,1)$.

$$y_{1i}^* = \alpha_{1i} + \beta_1 X_{1i} + \varepsilon_{1i} \tag{4.1}$$

Next let y_{2i}^* be the latent variable representing the propensity for that official to be

[17] This is consistent with typical Chinese usage of the term xiang, which can be translated as "native place." When two people are in the same province, they define commonality as being from the same town, but when further away (for instance, in Beijing), someone from the same province is viewed as being from the same native place.

Table 10: Summary Statistics for the 2012 Provincial Politburo Standing Committee members [a]

	Obs	Mean	Std. Dev.	Min	Max
Variables					
Being indicted before Oct. 2015	322	0.084	0.278	0	1
Being reported to be a subordinate of*any* big tiger	322	0.053	0.224	0	1
Indicators					
Connected with *any* of the big tigers					
Home province ties (*tongxiang*, same province)	322	0.062	0.242	0	1
School ties (*tongxue*)	322	0.118	0.323	0	1
Work ties (*tongshi*)	322	0.233	0.423	0	1
Connected with *any* of other Central PSC members					
Home ties (*tongxiang*, same province)	322	0.081	0.273	0	1
School ties (*tongxue*)	322	0.283	0.451	0	1
Work ties (*tongshi*)	322	0.335	0.473	0	1
Ln(age)	322	4.003	0.073	3.784	4.174
Administrative rank [b]	322	0.211	0.409	0	1
Central-level work experience	322	0.224	0.417	0	1
State-owned enterprise leadership experience	322	0.087	0.282	0	1

[a] This table shows the summary statistics of indictments, personal ties, and demographics of the 2012 provincial politburo standing committee members (PPSC). For Zhou, the overlapping work experience includes any of the following cases: the Ministry of Petroleum Industry and PetroChina (1985-1998), the Ministry of Land and Resource (1998-1999), Sichuan province (1999-2002), the Central Politics and Laws Committee (2002-2012). For Ling Jihua, the overlapping work experience includes any of the following cases: the Central Committee of the Communist Youth League (1985-1995), General Office of the Central Committee (1995-2012). For Su Rong, the overlapping work experience includes any of the following cases: Qinghai province (2001-2003), Gansu province (2003-2006), Jiangxi province (2007-2012).

[b] Administrative Rank (1= provincial leading roles; 0= provincial assisting roles)

indicted in the corruption crackdown. This is a function of vector X_2, our measures of shared background between the official and post-2012 CPSC members, vector X_3, our set of control variables also believed to be associated with corruption and indictment, y^*_{1i}, the strength of the relationship with the three big tigers, and noise $\varepsilon_{2I} \sim N(0,1)$, with $cor(\varepsilon_1, \varepsilon_2) = \rho$.

$$y^*_{2i} = \alpha_{2i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \gamma y^*_{1i} + \varepsilon_{2i} \tag{4.2}$$

These latent variables each have corresponding observable counterparts. y_{1i} is an indicator variable that equals one if the personal connection is publicly disclosed. y_{2i} is an indicator variable that equals one if the official is indicted. An indictment occurs ($y_{2i} = 1$) if and only if $y^*_{2i} > 0$, and, finally, a personal connection is disclosed ($y_{1i} = 1$) if and only if an indictment occurred ($y_{2i} = 1$) and the connection is strong enough $y^*_{1i} > 0$.

$$y_{2i} = \mathbb{1}(y^*_{2i} > 0) \tag{4.3}$$

$$y_{1i} = \mathbb{1}(y_{2i} = 1) * \mathbb{1}(y^*_{1i} > 0) \tag{4.4}$$

Table 11: Connection to Xi Jinping and Indictments of provincial politburo standing committee (PPSC) members as of 2012 [a]

	If was Indicted in the First Round		
Any Potential Connection to Xi	0 = No	1 = Yes	Total
0 = No	254	27	281
1 = Yes	41	0	41
Total	295	27	322

[a] This table shows that none of the PPSC members of the year 2012 were investigated in the first round of anticorruption if they had home, workplace, or school ties with Xi Jinping. Pearson chi2(1)=4.3001; Fisher' exact=0.034.

The key coefficients of interest are β_1 , β_2 , and γ . They can be interpreted as follows. β_1 estimates the strength of the three shared-background proxies for personal connections. If these proxies are valid, we should expect these coefficients to be positive. β_2 measures the effect of personal ties with the incumbent Party leaders (proxied by shared background) on the likelihood of being indicted. If the Party's top leaders are protecting their own members, β_2 should be negative. Finally, γ represents the extent to which the followers of the big tigers are more likely to be indicted.

Given this data generating process, a naive single-equation probit model with disclosed connections y_{1i} on the right hand side and indictments y_{2i} on the left would be biased. To see this, suppose that a provincial leader is connected to the big tigers not due to shared background but due to some other unobservable factor (i.e., ε_{1i} is expected to be large). When we plug the first equation into the second, the effect of unobservable factors is amplified by the variable γ . Since the new term $\gamma\varepsilon_{1i}$ is not necessarily orthogonal to X_{2i} , the coefficient set β_2 is not identifiable.[18]

The above model is similar to the selection model suggested by (Heckman, 1979) and the bivariateprobit selection model suggested by (Van de Ven and Van Pragg, 1981). However, in our model a recursive problem occurs because the outcome of equation (4.1) is contained in equation (4.2). That is, an official is reported as connected with the big tigers partially because he has been investigated; however, whether he is investigated recursively depends on how strongly he is connected with the big tigers. Conventional technologies such as the Heckman two-step estimator and Van de Ven and Van Pragg's method cannot solve this issue. Instead, we adopt a full-information maximum likelihood estimation (FIML) approach. The log-likelihood function is constructed from the joint distribution of ε_1 and ε_2. With the FIML approach, all of the parameters can be identified.[19]

4.3 Estimation Results

Our key results appear in Table 12. Because connections to Xi Jinping perfectly predict immunity to investigation, we drop those 41 individuals from the sample and analyse the remaining 281. The top half of the table shows the estimated coefficients from equation

[18] More specifically, the true error term in the selection equation is $\gamma\varepsilon_{1i}+\varepsilon_{2i}$. If equation (4.2) is estimated only with the standard probit technology, the unknown parameter γ will show up in the denominator of the standardized β_2, and the identification is impossible. This is demonstrated formally in the appendix.

[19] Refer to Appendix for proof.

(4.1), which estimates the predictive power of the three proxies for connection. Home ties and work ties are both positive and strongly significant predictors of actual connections to the three tigers. Surprisingly, educational ties are also statistically significant in Column (1), but with a negative coefficient. However, this may be an artefact of this specific dataset. Very few individuals in the sample (only 6%) went to the same university as any of the three big tigers, and only one of those with a school tie was indicted and exposed publicly as being connected to a tiger.

In addition to being a necessary first step in our econometric approach, these results are important in their own right, providing the first direct test of these widely-used proxies for political connection. The positive and significant coefficients of home and work ties validate the use of these measures. The negative and significant relationship with school ties casts some doubt on the importance of this factor, but may be an artefact, as noted. The tigers attended less-prestigious universities, providing fewer opportunities to build networks with other elites through school ties.[20] By contrast, graduates of more prestigious universities may have stronger alumni networks at the national level. Similarly, alumni of provincial universities may have stronger networks if they pursue careers primarily within the same province.[21]

The bottom half of the table presents the coefficient estimates for equation (4.2), the predictors of indictment. These coefficients answer two questions. First, did connections to the big tigers increase the risk of indictment for an official? Second, did connections to post-2012 Politburo Standing Committee members (excluding Xi) provide protection from indictment?

The coefficient for "tiger connections" is our estimate for γ , capturing the extent to which having a connection to any of the tigers (Zhou, Ling, and Su), increases the odds of arrest. This is positive and statistically significant at the 90% level, consistent with our conclusion from the network analysis. The corruption crackdown disproportionately affected officials affiliated with these three.

The next coefficient is our β_2 , which captures whether having a potential tie with a current member of the Politburo Standing Committee reduces the likelihood of being investigated. In column (1), this variable equals 1 if the individual has any of the three potential ties to any of the six CPSC leaders. The coefficient here is negative but not significant, suggesting that these leaders were either unwilling or unable to protect those connected to them.

The remaining control variables are not crucial to our argument, but one, capturing whether a provincial official previously worked at the central level, suggests that some protection comes from having allies and connections at the top. However, this protection

[20] Zhou attended Beijing Petroleum Institute (now China University of Petroleum), Su attended Jilin University, and Ling attended Hunan University and the Communist Youth League Academy in Beijng. Fisman et al (2017) point out that some estimates of the importance of various ties may in fact be capturing a fixed effect. For instance, if alumni of the elite Peking University disproportionately make it to the top due to their abilities or prestige, a cross-sectional study would interpret them as advantaged from promotion by connections in any time period in which the top leadership already contained other alumni. They find evidence of this in promotions to the Politburo, using data from a longer time series in which the top leadership varies. Given our interest in a specific time period that approach is not available to us.

[21] Note, however, that Jia, Kudamatsu, and Seim (2013) find that school ties (as well as home ties) are not associated with promotion.

Table 12: A recursive probit model relationships between political connections and indictments [a]

	(1)	(2)	(3)	(4)
Equation (4.1): D.V. Connecting to Tigers (1 or 0)				
Proxies of connection to tigers (β_1):				
Shared education (*tongxue*)	-1.158**			
	(0.491)			
Shared origin (*tongxiang, same province*)	1.142**	1.048**	1.117**	1.130**
	(0.491)	(0.525)	(0.529)	(0.526)
Shared workplace (*tongshi*)	1.599***	1.511***	1.658***	1.661***
	(0.423)	(0.431)	(0.429)	(0.425)
Equation (4.2): D.V. Being Indicted in the First Anti-corruption Wave (1 or 0)				
Connection to a big tiger (γ)	0.761*	0.656	0.498*	0.508*
	(0.418)	(0.472)	(0.274)	(0.280)
Proxies of connections to Central Politburo Standing Committee members excluding Xi Jinping (β_2)				
Any connection (*tongxue, tongxiang or tongshi*)	-0.200	-0.238		
	(0.327)	(0.351)		
Shared education (*tongxue*)			-0.340	
			(0.815)	
Shared origin (*tongxiang, same province*)			0.004	-0.046
			(0.310)	(0.309)
Shared workplace (*tongshi*)			-0.596	-0.586
			(0.539)	(0.543)
Administrative rank (1=leading; 0=deputy)	-1.100	-1.001	-0.946	-0.961
	(0.759)	(0.748)	(0.585)	(0.593)
Ln(age)	-0.852	-0.772	0.000	0.000
	(3.000)	(3.032)	(0.001)	(0.001)
Central-level experience (1=yes; 0=no)	-1.782**	-1.644***	-1.492***	-1.521***
	(0.749)	(0.624)	(0.574)	(0.579)
State-owned enterprise leader (1=yes; 0=no)	0.111	0.093	0.231	0.235
	(0.334)	(0.414)	(0.313)	(0.308)
ρ	13.157	13.672**	15.843	12.365
Constant for both equations	Y	Y	Y	Y
Observations	281	281	281	281
Log pseudo-likelihood	-87.048	-87.803	-86.663	-87.027

[a] 41 individuals are dropped from the sample because connections to Xi Jinping perfectly predicted immunity to investigation. Robust standard errors in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

applies to anyone who has worked at the central level, not specifically people with connections to the incoming CPSC. Indeed, the work experience that would be coded as a 1 would have occurred under the leadership of a previous CPSC, not Xi Jinping's. Other control variables are not statistically significant.

The remaining columns are presented for robustness, but do not differ substantially from the results in column (1). Column (2) drops school ties from equation (1). Column (3) splits out the three different kinds of ties to CPSC members in case one might be skewing the results. They continue to be small and not significantly different from zero. Column (4) drops educational ties from equation (2), since they proved to have a negative relationship with personal connections in equation (1). Results are substantively similar across all of these specifications.

To recap, these results suggest that Xi Jinping was the only member of the CPSC who would or could effectively protect his allies from the crackdown, which is consistent with the interpretation of the crackdown as a power consolidation measure by Xi Jinping.[22] The associates of the three big tigers, by contrast, faced a significantly higher risk of arrest. While this could be interpreted as a factional purge, the evidence provided in previous sections suggests that it was also motivated by a desire to weed out those undermining the party's aspirations to meritocracy.

5 Discussion and Conclusions

Our analysis helps us evaluate two competing interpretations of Xi Jinping's wide-ranging corruption crackdown. One interpretation is that it is largely a sham exercise masking an attempt to destroy the support networks of political competitors and consolidate power in one set of hands, and undermining the increasingly meritocratic and pragmatic governance introduced under Deng. The other interpretation views Xi's crackdown as reaffirming the party's commitment to improving governance within the framework of a Leninist authoritarian hierarchy. In this interpretation, the increasingly egregious and extravagantly public corruption of the post-reform era had eroded the regime's support and hampered its ability to achieve its policy goals. In a time when China could no longer rely on the easy gains to be had from its initial process of economic reform and opening up this change had become imperative.

This study finds support for both claims. In section 2 we showed that local governments perceived as corrupt by private firms tended to have higher rates of indictments. We also showed that the largest network of indicted officials was not centered around Xi's most likely competitor for party leadership, but rather around three other high-level leaders who were already on their way out of power. In section 3 we offer an explanation for this targeting. In the provinces where these three tigers were most influential, promotions appeared substantially less meritocratic than elsewhere, and instead appeared to be a reward for corruption. Moreover, we find that individuals who appear to have been promoted for the wrong reasons were much more likely to have been were more likely to later be indicted in the crackdown. Finally, in section 4, we find evidence that Xi Jinping protected individuals

[22] One could of course posit that throughout his career Xi surrounded himself with only the cleanest individuals. This conflicts sharply with the evidence of his family's wealth documented by Bloomberg (2012), but receives some support from Chen and Kung (2018).

close to him, while his fellow members of the Politburo Standing Committee were unable to do the same.

We cannot say for certain how these developments will play out. The leading role of the party's opaque and unaccountable Central Discipline and Inspection Commission in the crackdown represents a reversal of an earlier trend toward greater reliance on legal processes carried out by state institutions. It undermines attempts by party leaders over the preceding two decades to find ways to make use of (tightly constrained) popular input to improve governance. One might expect removal of kleptocratic local officials to spur growth, but anecdotal evidence also suggests that the crackdown may have gone too far, leaving officials afraid even to take a constructive role in facilitating economic development in their jurisdictions due to the risk of being viewed as corrupt[23]. Overarching all of this, the consolidation of power in Xi Jinping's hands and the ending of residential term limits raises the spectre of Mao and many other autocrats who continued to rule long after they ceased to be useful even to the other elites who helped put them in power.

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A Identification of the Recursive Selection Model

The recursive probit model is

$$\begin{aligned} y_{1i}^* &= \beta_1 x_{1i} + \epsilon_{1i} \\ y_{2i}^* &= \beta_2 x_{2i} + \gamma y_{1i}^* + \epsilon_{2i} \\ y_{2i} &= \mathbf{1}(y_{2i}^* > 0) \\ y_{1i} &= \mathbf{1}(y_{1i}^* > 0)\mathbf{1}(y_{2i}^* > 0) \\ \epsilon_{1i} &\sim N(0,1), \epsilon_{2i} \sim N(0,1), cor(\epsilon_{1i}, \epsilon_{2i}) = \rho \end{aligned} \tag{A.1}$$

In the Heckman selection model, or a standard bi-probit model without recursion, the equation of selection (the second one) can be estimated independently as long as the error term is uncorrelated to regressors. To disprove this in our model, plug the first equation into the second, then we have

$$y_{2i}^* = \gamma\beta_1 x_{1i} + \beta_2 x_{2i} + \gamma\epsilon_{1i} + \epsilon_{2i} \tag{A.2}$$

Let C denote $\sqrt{1+\gamma^2+2\rho\gamma}$, then (A.2) is equivalent to

$$y_{2i}^*/C = (\gamma\beta_1/C)\cdot x_{1i} + (\beta_2/C)\cdot x_{2i} + v_{2i} \tag{A.3}$$

where $v_{2i} = (\gamma\epsilon_{1i} + \epsilon_{2i})/C \sim N(0,1)$. It is obvious that, even if there were no selection bias and $\rho = 0$, estimation of X_{2i} is biased for the recursive coefficient γ. Define $v_{1i} \equiv \epsilon_{1i} \sim N(0,1)$. The model is equivalent to

$$\begin{aligned} y_{1i}^* &= \beta_1 x_{1i} + \epsilon_{1i} \\ y_{2i}^*/C &= (\gamma\beta_1/C)\cdot x_{1i} + (\beta_2/C)\cdot x_{2i} + v_{2i} \\ y_{2i} &= \mathbf{1}(y_{2i}^* > 0) \\ y_{1i} &= \mathbf{1}(y_{1i}^* > 0)\mathbf{1}(y_{2i}^* > 0) \\ v_{1i} &\sim N(0,1), v_{2i} \sim N(0,1), cor(v_{1i}, v_{2i}) = (\rho+\gamma)/C \end{aligned} \tag{A.4}$$

The above equation system turns out to be a standard bi-probit selection model, so the coefficients β_1, $\gamma\beta_1/C$, β_2/C and $(\rho+\gamma)/C$ are identified. Then we can calculate the values of β_1, γ/C and ρ/C. Let A denote γ/C and B denote ρ/C, a simple calculation brings us $\gamma = A/\sqrt{1-2AB-A^2}$, $\rho = B/\sqrt{1-2AB-A^2}$. Since γ and β are identified, we can get C. Note that β_2/C is already known, β_2 is then identifiable.