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

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PERSONAL TIES, MERITOCRACY, AND CHINA'S ANTI-CORRUPTION CAMPAIGN [1]

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We investigate the initial phase of China's anti-corruption campaign under Xi Jinping, finding that arrests are associated with departures from standard promotion practices that rewarded officials for GDP growth performance and elite career paths. Almost no individuals connected to the General Secretary or the Premier were arrested, but connections to the broader Politburo Standing Committee were not protective. Using new data on elite connections revealed by corruption investigations, we confirm the importance of workplace and hometown ties in Chinese politics, and find additional evidence contradicting a narrow power-consolidation view of the crackdown.

KEYWORDS: corruption, meritocracy, personal ties, economic growth.

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1. INTRODUCTION

We study the initial phase of China's massive anti-corruption campaign, launched in 2012 by incoming Communist Party General Secretary Xi Jinping. Unlike prior anti-graft efforts, this crackdown resulted in the arrest of a large number of officials even at very high levels of the government. However, some argue that this initiative should be seen primarily as a political purge designed to consolidate Xi's power by removing his rivals and their supporters (Yuen, 2014; Xuecun, 2015). Divergent interpretations of the corruption crackdown relate to a longer-running debate about China's political economy. Inclusive democratic institutions are widely believed to crucial for economic development (Acemoglu and Robinson, 2012), yet China's achievement of rapid growth stands as an awkward counterexample. Some attribute this success to a meritocratic hierarchical structure, in which regional officials compete against each other for promotion through economic development(Qian and Xu, 1993; Maskin et al., 2000; Xu, 2011). Others, however, view the political system as primarily driven by factionalism and personal networks, not merit(Shih et al., 2012; Francois et al., 2020). The anti-corruption campaign provides us a new context in which to assess these competing perspectives. Under the charitable view, the anti-corruption campaign could be seen as a sincere attempt to shore up this meritocracy. Under the cynical view, the campaign could be seen as a dramatic escalation of existing factional conflict, worsening existing flaws in the system.

Our analysis has three components. First, we examine patterns of promotion in prefecture-level (city) governments. In provinces that had a less intense top-level purge, these promotion patterns were consistent with the meritocracy hypothesis: prefectural leaders (mayors and party secretaries) who outperformed their peers on GDP growth were more likely to be promoted. In addition, previous service in high-prestige positions in the provincial capital was also associated with promotion. This is a kind of managerial fast track: high performers groomed in the capital are sent out to job rotations in local governments to gain experience, and tend to advance more quickly than officials who rose only through local government. In addition to providing a greater breadth of experience, this kind of predictable career path for elites helps

reinforce their commitment to the regime (Svolik, 2012) and avoids creating a pool of talented disgruntled outsiders who could threaten the system (Bai and Jia, 2016).

By contrast, these associations are attenuated or non-existent in the provinces whose leadership was hit harder by the purge. Neither growth performance nor experience in the capital increased the likelihood of promotion. Moreover, the greater the departure from standard promotion patterns, the more arrests were subsequently made among the provincial leaders who oversaw these promotions. We also find some evidence that prefectural officials who received unusual promotions were more likely to be arrested later. Together, these findings suggest that the arrests were intended to reinforce a desired set of norms around promotion. These norms supported meritocratic goals as well as maintenance of centralized hierarchical authority and stable elite paths to power.

Second, we assess the power consolidation argument by examining higher levels of government in which personal connections to the party's top leaders are common. Across the population of province-level officials, we find that personal ties to the Politburo Standing Committee did not reduce the likelihood of a provincial official being arrested. However, ties specifically to either of the top two leaders, General Secretary Xi Jinping and Premier Li Keqiang, did appear to be protective. Previous work experience at the central level also reduced the likelihood of arrest. These findings do not strongly support the idea that Xi used arrests to consolidate his personal power at the expense of other top leaders or factions. Rather, they appear to reflect re-establishment of the primacy of the Beijing-centered elite and their proteges over party members who rose through the ranks in the provinces.

Third, we take advantage of the fact that the corruption crackdown exposed actual connections among arrested officials. Mapping this network, we find that the three most central individuals were powerful officials with strong provincial connections who were not direct competitors with Xi for party leadership. By contrast, the most credible direct competitor of Xi, Bo Xilai, ranked 49th in the network, below 39 individuals with lower formal government ranks. While only suggestive, these facts go against the claim that the crackdown was purely about power consolidation. We then

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integrate the exposed network connections among arrested officials with other measures of connection, using a recursive selection model. This confirms the robustness of our earlier findings that central-level work experience and personal ties to the top two leaders were associated with a reduced likelihood of arrest. This analysis also confirms the validity of workplace and hometown ties as proxies for personal connections in Chinese politics, and casts doubt on the importance of educational ties.

In aggregate, these results provide support neither for the most positive interpretation of the campaign as a purely principled reinforcement of meritocracy, nor its most negative interpretation as a move to consolidate power in the hands of one man. Rather, these findings suggest an attempt to fix some of the problems of corruption and personalistic networks highlighted in the negative accounts by re-centralizing authority and punishing those who had departed from standard promotion practices viewed as desirable by Beijing-based central elites. These practices included meritocratic elements, such as rewarding GDP growth, but also elements that might better be seen as strengthening party control by maintaining predictable paths to advancement for selected elites. Both in provincial-level promotions and national level arrests, we see a bias against individuals who rose up through the ranks of local governments in favor of those who served in the capital first.

Our results provide support for theories developed by Li et al. (2018) and Xi et al. (2020), both of which conclude that periodic recentralization of power can be necessary in a crony capitalist autocracy in order to prevent corruption from reaching regime-destabilizing levels. They also complement several other recent empirical papers. Jiang and Xu (2015), Zhu and Zhang (2017), and Goh et al. (2020) each find a long-standing pattern of elite connections providing shelter from corruption charges but do not systematically examine whether the Xi era differs from earlier periods. Griffin et al. (2016) find similar results to ours in the corporate setting, with arrests targeting apparently corrupt executives but elite connections providing protection.

Our results also contribute to the large empirical literature on promotions in China. This line of research, launched by Li and Zhou (2005), has explored whether better economic performance is associated with a greater possibility of being promoted,

taking positive results as an indication of meritocracy. Results have been mixed(Tao et al., 2010), and other research also finds an important role for personal connections (Shih et al., 2012; Jia et al., 2015; Jiang, 2018; Francois et al., 2020; Fisman et al., 2018) or outright corruption (Chen and Kung, 2018). Jia and Xu (2018) show the long-standing importance of elite career tracks with job rotations for party elites. Our research links these factors with the motivations and targeting of the crackdown. More broadly, this paper contributes to the emergent literature on the personnel economics of development (Xu, 2018; Bertrand et al., 2020; Finan et al., 2017), as well as the literature on the political economy of autocracy (surveyed in Egorov and Sonin (2020)).

2. THE CORRUPTION CRACKDOWN AND PARTY PROMOTION NORMS

In this section, we show evidence that the provinces whose top leadership was hit hardest by the initial crackdown were also ones that had departed from existing promotion norms. Provincial leaders decide on the promotions of prefectural leaders, so any departures from standard practice would be their responsibility. In most of China, and especially in the provinces where there were fewer high-level arrests, promotions tended to go to prefectural leaders who presided over relatively rapid economic growth or who were already on standard elite career paths. In the provinces where the initial purge hit the provincial leadership hardest, this pattern had been violated. To put it another way, the more unexpected promotions that occurred under the oversight of a provincial leadership group, the more of that group's members were subsequently arrested. We also show that for prefecture-level officials, being promoted made arrest more likely only after controlling for other promotion predictors, again suggesting that atypical promotions were a target.

2.1. *Data*

In our first analysis, we examine predictors of promotion for prefecture-level officials. Prefectures are the level of government directly below the provincial level. Almost all comprise a central city and a hinterland that includes rural areas and often

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other smaller cities and towns. Like most units of government in China, each prefecture has two top leaders: a government executive (the mayor) and a party secretary who has authority over the mayor. We include both. These officials are appointed to their positions by provincial authorities. Their appointments are limited to five years, but typically end early with a transfer or promotion. The average duration of an appointment in our dataset is around three years. Their promotions are overseen and authorized by leaders at the next level up, the province.

We include prefectures from 25 province-level political units. These comprise 22 provinces and the province-level regions of Ningxia, Inner Mongolia, and Guangxi. We exclude Tibet and Xinjiang due to lack of data. We also exclude the province-level municipalities of Beijing, Shanghai, Tianjin, and Chongqing as their officials at analogous ranks have different responsibilities.

One observation in our dataset is the end-of-term outcome for a prefectural leader who took office in or after January 2006 and who left office by the end of 2012. Our goal is to capture patterns of promotion in the political cycle preceding Xi Jinping's elevation to General Secretary in late 2012. Appointments at the subnational level generally last less than five years, so they do not follow the same five-year schedule as national politics. We therefore examine terms in office that began as early as 2006, up to twenty months before the Party Congress of October 2007, when Xi joined the Politburo Standing Committee as heir apparent under General Secretary Hu Jintao.

Our main outcome variable is whether a leader is promoted when his or her term ends. It is considered a promotion when a leader is moved to a sub-provincial or higher level government unit, when a leader is assigned a post in a central ministry, or when a leader moves from mayor to party secretary. This and other personal information are gathered from online curriculum vitae.

We measure economic performance as relative GDP, the difference between the GDP growth rate in that prefecture while a leader was in office and the contemporaneous growth rates of other prefectures in the same province, against whom that leader would be compared. We also include indicators of being on an elite career path prior to entering prefectural leadership. These include work experience for the

Provincial General Office or other province-level units, and work in the province-level Communist Youth League. Individuals from these backgrounds are often rotated to sub-provincial roles to gain more diverse experiences with the expectation that they will return to the capital afterwards, making promotion easier for them.

As controls, we include several biographical variables expected to affect promotion odds based on the previous literature (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 (length of time in the post) is important: promotions tend 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 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 might get easily promoted despite poor economic performance because of their connections, not their perceived ability. 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., 2020). Based on publicly available biographic data, these indicate for each prefectural official whether he or she had possible ties with anyone who was a member of that province's Politburo Standing Committee at the time of promotion. These ties include having the same home 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 I provides summary statistics for all these variables.

We examine how the predictive power of these variables changes with the intensity of the initial province-level purge. Purge intensity is measured as the number of province-level indictments that took place between November 2012, when Xi be-

came General Secretary, and September 2015. These indictments were publicly posted on the website of the Central Discipline Inspection Commission. Figure 1 orders the provinces by the number of province-level arrests during this time period. The number varies from zero in Ningxia up to twelve in Shanxi. We use the number of indicted officials at the provincial level for three reasons. First, each province has approximately the same number of officials at this level, avoiding issues with the choice of denominator that would arise if we used the full set of officials at all levels in the province. Second, we can be confident that we have identified all arrests at this level, whereas this would be less certain at lower levels. Third, our interest is not so much in the number of low-level arrests, such as might occur if one county were a hotbed for misbehavior. Rather, we are interested in promotion decisions at the prefectural level that would be made by provincial leaders.

2.2. *Heterogeneous promotion patterns*

In this subsection, we examine whether departure from existing promotion norms is associated with a more severe province-level crackdown, using a linear probability model. Table II demonstrates that during this period, relative GDP growth was positively but not significantly associated with promotion. Previous work experience in the provincial general office has a more robust association, while career paths going through the provincial Youth League or other provincial government departments have a positive association but are not significant after the inclusion of controls. In addition, consistent with previous research, we find that age is negatively associated with promotion.[1]

In Table III, we examine whether the wide variation in the number of province-level arrests shown in Figure 1 is associated with differences in promotion patterns across provinces. In column 1 we restrict the sample to prefectures from the half of

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[1]Note that by regulation Youth League officers enter the system at higher levels, giving them a persistent age advantage(Kou and Tsai, 2014). In our sample, the mean age of individuals with Provincial Youth League experience is four years (one standard deviation) lower than their peers. This control will therefore attenuate estimates of the Youth League coefficient.

the provinces (12 of 25) that had less than three high-level arrests. In these low-arrest provinces, promotion patterns are much more clearly consistent with official norms and with the findings of previous research. Relative GDP performance as well as province-level experience in the Youth League and the General Office are all significantly associated with subsequent promotion. By contrast, we see in column 2 that in the high-arrest provinces (the 13 provinces with three or more arrests) GDP outperformance has a small negative association with promotion. The sign on Youth League experience also flips to negative, and the coefficients on province-level government work experience become smaller and non-significant. The contrast becomes even sharper if we look at just the three highest-arrest provinces, in column 3. In these provinces, all forms of province-level experience have negative coefficients, and significantly so for General Office experience. The negative coefficient estimate on relative GDP growth also becomes slightly larger although still non-significant.

Columns 4 and 5 make these comparisons directly, using interaction terms. Both specifications treat the twelve low-arrest provinces from column 1 as the reference group. In column 4, we compare the low-arrest group with the higher-arrest portion of the sample examined in column 2, while in column 5 we compare it against the three highest-arrest provinces examined in column 3. In both cases, the coefficient of the interaction on GDP growth is negative and statistically significant. That is, we can reject the hypothesis that promotion in the high-arrest provinces has the same correlation with GDP growth as it does in the low arrest provinces, and we cannot reject the hypothesis that in high-arrest provinces there is no association at all. Similarly, prior work experience in elite province-level jobs such as the General Office, other government departments or the Youth League appears to hinder rather than help promotion odds in the high-arrest provinces.[2]

A natural concern is that the positive association of prior experience in the provincial General Office or provincial Youth League is proxying for personal connections

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[2]In Appendix Table I we interact all variables, including control variables. In Appendix Table II we interact with indices based on the number of arrests instead of using binary cutoffs. These approaches yield similar results.

formed during that time. However, officials with this experience usually served the office early in their careers and in relatively lower-ranked positions. They thus are unlikely to have overlapped with or had opportunities to meet the provincial leaders who presided over their promotion from prefecture level years later[3] These results support our interpretation that an elite career path is valued in its own right, rather than just proxying for ties between prefecture leaders and provincial leaders. These results also mitigate the concern that leaders with personal connections receive the best postings, as Shih et al. (2012) found in higher levels of the government. Were good assignments highly correlated with good connections, inclusion of controls for personal ties would be expected to attenuate the association of promotion with economic performance that we find here. It does not.

In sum, these results support our hypothesis that promotion standards were not the same in high-arrest provinces as in low-arrest provinces. In low-arrest provinces, promotions fit the patterns found in prior research. Officials who presided over higher growth were promoted more rapidly, as were individuals who had followed the standard fast track to success. In high-arrest provinces, the association of GDP growth with promotion was close to zero, and prior experience at the provincial level did not help and may even have been a mark against candidates.

2.3. *Unusual promotions and provincial leadership indictments*

Figure 2 approaches the question in a different way. In this figure, we use the coefficient estimates from the low-arrest provinces (Column 1 of Table III) and compare the predicted against the actual values for each of the three sets of provinces. We include all our predictor variables, including controls, since our focus is purely on differences in the predicted likelihood of promotion, not causal linkages between any specific variable and promotion. By construction, promotions in the low-arrest

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[3]Appendix Table III tests this explicitly by include controls for personal ties between prefectural leaders and members of the provincial party standing committee (PPSC) who would have overseen their promotion. Our main results are unaffected and we do not find any significant relationships between these ties and promotion.

provinces fit the predictions. In contrast, the relationship between predicted and actual promotions is flatter in the high-arrest provinces and downward sloping in the highest-arrest provinces. That is, if we take practices in the low-arrest provinces as the norm, more arrests are associated with more substantial departures from that norm.

Continuing with this alternative approach, we construct a province-level measure of unexpected promotion activity. We first generate predicted promotion probabilities using the coefficient estimates from the complete sample with all controls in Table II, Column 2. If an official is promoted, we measure the unexpectedness of this promotion as the prediction error $1 - \mathbf{xb}$, where $\mathbf{xb}$ is the predicted promotion likelihood from this linear probability model. Thus, the lower $\mathbf{xb}$ is the more unusual the promotion is.[4]

We then regress the number of province-level arrests on this error, the extent of departures from standard (or at least statistically typical) practice in promotions. In Table IV, Column 1, we see that unusual promotion activity is indeed associated with a more thoroughgoing purge at the province level. That is, when a group of province-level officials presided over more unusual promotions before Xi's ascension, more of them were purged afterwards. In Column 2, we look at non-promotions, measuring the unexpectedness or error of these non-promotions with $\mathbf{xb}$ instead of $1 - \mathbf{xb}$. The more strongly other variables predict promotion, the more surprising a non-promotion is. We find that the coefficient on this variable is negative but not significant. Column 3 includes both the unexpectedness of promotions and of non-promotions in the same specification. The coefficient estimate on promotions is about the same, while the coefficient on non-promotion error remains non-significant and becomes small and positive. Finally, in column 4 we assume that the unexpectedness of a promotion $(1 - \mathbf{xb})$ and the unexpectedness of a non-promotion $(\mathbf{xb})$ can be viewed

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[4]Here, the coefficients in $\mathbf{b}$ come from a regression including all the provinces, not just the low-arrest provinces. This avoids simply making the low-arrest provinces "normal" by construction. Provincial fixed effects are also not included in the predictions, since variation between provinces is what we are looking for. Appendix Table IV conducts the same exercise using coefficient estimates based only on low-arrest provinces, yielding similar but even stronger results.

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as equivalent and averaged together. Doing so provides an estimate roughly halfway between the previous coefficient estimates, but with a much larger standard error. This suggests the assumption of equivalence is probably not correct. An undeserved promotion matters more.

Together, these results suggest a further refinement to our conclusion, that the problem (from the party's perspective) was primarily with the wrong people being promoted. This departure from the expected pattern would be consistent with individuals being promoted for reasons other than perceived merit, such as outright bribery, as argued in (Aidt et al., 2020), or as a reward for longer-term collusion with corrupt activities by their superiors at the provincial level. By contrast, failure to promote someone who might otherwise have been expected to go up in rank is less problematic.

2.4. *Arrests of prefecture-level officials*

Here, we look at the variables that predict whether an individual is arrested, again focusing on arrests and indictments that took place from November 2012 to Septmeber 2015. Our goal is to see whether there is evidence of non-meritocratic promotion leading to an increased likelihood of an individual being arrested, irrespective of province. Unfortunately, the approach in the previous section of looking at the overall unexpectedness of a promotion does not work in this context, as the predictors of promotion could also be associated with opportunities or incentives to engage in corruption. For instance, Xi et al. (2020) finds that a record of growth performance predicts arrest among officials serving after 2012. The problem is that high relative growth makes an official more likely to be promoted as a reward for performance, as shown in our earlier analysis. However it also creates more opportunities for rent-seeking, for instance by brokering land deals. Indeed corruption and growth may be complementary in the Chinese economic model (Bai et al., 2014). Similarly, age is associated with a lower chance of being promoted, but it could also be that older officials might be more tempted to seize present opportunities for self-enrichment for that reason.

To get around this problem, we use the arrest rate of un-promoted officials as a baseline. Their arrests should be for reasons unrelated to an illicit promotion. Then controlling for these baseline effects, variables associated with legitimate promotion should be negatively associated with arrest. We use a linear probability model, with arrest as the dependent variable. [5]

First, we examine whether a promotion itself inherently puts an official at risk, perhaps by making that person a bigger political target. The simple specification in Table V Column 1 indicates that this is not the case. Moving on, we include the same variables as in our promotion models, with the addition of an indicator variable for officials at or above age 60 in 2013 and therefore slated to retire under Xi. In Column 2, we look at our reference group of non-promoted individuals. The retirement indicator has a negative and significant association with arrest. This result, which is consistent across all our specifications, suggests that individuals exiting political life were more likely to be spared. Controlling for this, however, age is positively associated with arrest. Since these officials are of the same rank, these results taken together mean that officials who had a shorter career remaining (but not yet in their last post) were more likely to be arrested. In Column 3, we conduct the same analysis on promoted officials. Male Gender is the only predictor significantly different from zero, but relative to the non-promoted group, the signs of almost all of the coefficients change substantially, suggesting the factors associated with arrest are different between the two groups.

In column 4, we use interaction terms to directly test for this heterogeneity. Most notably, being promoted is itself a highly significant predictor of investigation, once the other controls are included. This has two plausible interpretations. One is that being promoted itself makes an official more politically salient and therefore a target. The other interpretation, consistent with our analysis elsewhere, is that these individuals advanced through irregular means. The fact that the coefficient on promotion is only significant after controlling for other factors provides some support for the

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[5]Here, the outcome of interest is an indictment, which applies to an individual, not a specific term of service, so our unit of observation differs slightly from that used in previous analyses. See Appendix Table V for summary statistics.

second interpretation.

This full specification also yields several other interesting results. First, we see that non-promoted officials presiding over stronger GDP growth were significantly more likely to be arrested, while for promoted officials, the sign flips, giving a net effect of approximately zero. As suggested above this would be consistent with higher growth creating more opportunities for rent-seeking while reducing the need to seek promotion through illegitimate means. Similarly, the positive association of age with investigation in non-promoted officials is also almost completely negated by the interaction for promoted officials, suggesting that there is a temptation to cash in near the end of a career that is lessened for officials who have more reason to anticipate further promotions.

2.5. *Summary*

To recap, this section looked at promotion patterns among prefecture-level officials and their relationship with arrests at the provincial and prefectural level. At the provincial level, we found that provinces that had a more thorough purge in the provincial top leadership also departed from standard promotion norms. Correspondingly, we also found that the more unusual the promotion pattern was in a province, the more province-level officials were subsequently arrested. At the prefecture level, we found that receiving a promotion increased the likelihood of subsequent arrest after controlling for other factors associated with both promotion and arrest.

3. PERSONAL TIES AND ARRESTS OF PROVINCE-LEVEL OFFICIALS

The previous section provided evidence that the crackdown was aimed at officials and regions deviating from standard promotion norms. In this section, we examine the power consolidation argument by testing whether personal connections to the new leadership provided protection from investigation. In order to examine a population whose members have direct connections to the top elites, we move from the prefectural level examined thus far to the next level up, the provincial level.

We find several interesting relationships. First, ties to a post-2012 Central Polit-

buro Standing Committee (CPSC) member did not reduce the likelihood of arrest. However, having any ties to top leader Xi Jinping brought the likelihood of arrest to zero.[6] While this might appear to support a power consolidation story, ties to Premier Li Keqiang, generally viewed as a member of a competing faction, were equally protective. Moreover, having any past experience at the central government level or attending one of China's two most elite universities in Beijing sharply reduced the odds of arrest. On the whole, these findings suggest that the crackdown targeted provincial level officials who were enmeshed in provincial networks and tended to spare those who were members of the central elite. This appears more like a general recentralization of party authority, rather than a specific purge of Xi's competitors.

3.1. *Sample population and data*

Our sample is the set of all members of the Provincial Party Standing Committees (PPSC) in each province. Each PPSC is made up of roughly a dozen people who hold the most powerful party and government posts of a province. These include the party secretary, the governor, and the head of the provincial discipline inspection commission, among others. 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 the crackdown began. This gives us a total of 322 people, of whom 27 (8.3%) were indicted in the first wave of the crackdown.

For each provincial official, we use biographical information to code their potential ties with each of 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. As in the previous section, we view connections as work, home, or school ties between officials at one level (here, the province) and officials at a higher level (here, the national Politburo Standing Committee). School ties and workplace ties are coded the same as before,

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[6]These results are consistent with descriptive statistics presented in Jiang and Xu (2015).

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but in this national context home ties are viewed more broadly to include individuals from the same province, not just the same hometown. Importantly, these potential ties are mostly or completely out of the control of the individuals in question.

We also collect information on other variables that might affect the likelihood of engaging in or being indicted for corruption. First is central work experience. Promising officials in central ministries are often transferred to local or regional government postings in the spirit of job rotation, just as up-and-comers working in the provincial capital are sent to get experience at the sub-provincial level. Such experiences at the central level may also foster connection-building with other current and rising elites. Officials lacking central experience could be more enmeshed in and dependent on personal networks within their provinces and less concerned with further promotion to the national level (Persson and Persson, 2016). By contrast, those with central experience would be relatively free of these ties and more focused on pleasing people in Beijing. In this respect, connections would act as complements to desired behavior as in Jia et al. (2015), rather than substitutes as in Xu (2018). Of course, in addition to having different objectives, officials with central experience might have more allies and protectors at the central level, also reducing their likelihood of being indicted irrespective of their actual corruption.

Second is leadership experience in the Communist Youth League. It is widely asserted that alumni of the Youth League form a cohesive faction within the party (Li, 2016; Francois et al., 2020). Since membership itself is commonplace, we code officials as Youth League alumni only if they worked at the provincial level or higher, indicating that this was a significant part of their career progression.

Third is leadership experience in a state-owned enterprise. State-owned enterprise management is a distinct career path which only occasionally leads to provincial leadership roles (Leutert, 2018). As such officials may have had more opportunities to engage in corruption themselves through their involvement in commerce we control for this background.

We also include rank because higher-ranked individuals might be viewed as more important target. We control for age because China's age limits at each level of

government mean the opportunities for advancement of someone older than others in similar posts is limited. This lack of opportunities may not only diminish effort (Bertrand et al., 2020) but also increase rent-seeking activities. On the other hand, older officials may be lower priority as investigation targets if they cannot advance or will soon retire, making them less important whether as political competitors or as perpetuators of ongoing corruption.

Note that in this context we cannot control for merit in the sense of GDP performance. Most of these officials are responsible for portfolios that do not have a single publicly available performance indicator, unlike the prefecture-level mayors and party secretaries analyzed above. Summary statistics are provided in Appendix Table VI.

3.2. *Analysis*

Table VI presents our results. We first look at whether Politburo Standing Committee connections reduce the likelihood of arrest. In column 1, we follow previous studies in treating all members of the Politburo Standing Committee as equivalent (Fisman et al., 2018; Jia et al., 2015). The coefficient estimate suggests that connected individuals were less likely to be arrested, but this finding is not statistically significant. This estimate is almost unchanged when we include additional demographic and faction-related control variables in column 2. Interestingly, Youth League experience does not have a significant impact on the likelihood of indictment, going against the idea of a Youth League faction either protecting its own or being targeted by opposing factions. However, prior central ministry work experience has a strong and significant negative association with investigation. This echoes our finding in the previous section that local officials with previous experience at a higher level of government (in the provincial capital) were typically more likely to be promoted. It also shares the same ambiguous interpretation. It could be that officials with experience in the ministries were less likely to get enmeshed in local networks engaging in corruption or other activities targeted by the campaign. Alternatively, high-level connections may have protected them regardless of their actual activities.

Since our objective here is to gain insight into the relative importance of the power

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consolidation and party strengthening motives in the anti-corruption drive, we next break out connections to the two top leaders Xi Jinping and Li Keqiang individually in columns 3 and 4. In both cases, individuals with ties to them were much less likely to be arrested. Indeed, this is visible in the raw data. None of the 41 officials with a tie to Xi were indicted, and there was only one indictment among the 59 officials with a tie to Li. This contradicts a simple power consolidation argument, since Li Keqiang was viewed as the highest-level sitting official from a faction competing with Xi's.[7]

We also examine what kinds of personal ties seem to matter.[8]. Prior research has yielded mixed findings regarding what kinds of connections are most important in Chinese politics. Jia et al. (2015) emphasizes work ties, while Fisman et al. (2018) finds that work ties are less important and hometown and school ties have a primarily negative impact on promotion through intra-factional competition. For Xi, Li, and Yu, the three members who appeared to provide the strongest protective shield, we find that all three types of ties appear significant where they exist, except for work ties with Li Keqiang. However, as Fisman et al. (2020) points out, top leaders often share elite similar backgrounds. Xi Jinping and Li Keqiang attended China's two most prestigious and competitive universities, Peking University and Tsinghua University. The fact that alumni of these universities were spared may in fact represent a general protection of centrally-linked elites, similar to the negative coefficient on central-level work experience. Regardless of the precise cause, these results suggest that connections to Xi did not provide a unique protective umbrella, as would be implied by a

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[7]In Appendix Table VII, we examine each Standing Committee member separately. Surprisingly, we see that ties to Wang Qishan, who headed the crackdown, were associated with a weakly greater likelihood of arrest. In addition, Yu Zhengsheng emerges as a strong "protector" in this specification. None of his 32 connections were arrested. As one of many other Standing Committee members his role is not central to our analysis and should not be overinterpreted, but we speculate that his strong connections to past leaders play a role. Yu Zhengsheng was ranked fourth of the seven Standing Committee members, but may have had an important informal role: almost ten years older than Xi and Li, he has been described as an important princeling with close ties to former paramount leaders Deng Xiaoping (Lam, 2015) and Jiang Zemin (Li, 2016). His apparent protection of his allies also suggests power balancing among factions rather than a dominant role for Xi.

[8]Results in Appendix Table VIII

simple power consolidation theory.

4. PERSONAL CONNECTIONS REVEALED BY CORRUPTION INVESTIGATIONS

In this section, we take advantage of a new source of data on personal networks in Chinese politics not used by previous researchers, the information disclosed to the public about collusion among disgraced officials. This data, measuring actual connections, supplements the data used in this study and previous studies that only captures commonalities of background. We do two things. First, we show that the most central players in this network were connected to the three provinces identified above as diverging from standard promotion practices. Surprisingly, the most realistic direct challenger to Xi Jinping (Bo Xilai), ranks much lower in the network than most of his peers. Second, we use a recursive specification to integrate this direct but partial data on connections with the common-background measures of connection. This confirms our earlier findings and provides some evidence that educational connections are less important than sometimes posited.

4.1. *Data*

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 knew 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. By September 2015, more than 1000 names were on the CDI's list. Among these names, 82 were senior officials at or above the

deputy governor level, and four were national leaders.

For each of these officials we searched all available party reports, news items, and legal documents. 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.

All other data used in this section is identical to that used in the previous section.

4.2. *Network visualization and descriptive analysis*

Figure 3 graphs the hierarchical corruption network implied by our data. Each node represents an arrested 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 eigenvector centrality, 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 because those subordinates in turn head larger networks.[9]

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.

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[9]Other commonly-used network rankings such as degree centrality, closeness centrality, or betweenness centrality are inappropriate for this application because they do not take into account its hierarchical structure.

Almost all of the most prominent victims of the crackdown are located within this central network. Table VII lists the top players in this network, ordered by their network ranking. 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 the highest-ranked civilian leaders netted in the first phase of the crackdown, the "big tigers."[10]

Notably, another prominent official, Bo Xilai, ranks only 49th. This is below not only these three big tigers but also 6 peers at the same level of government as him and 39 individuals with lower formal ranks. 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 "princeling," descended from a senior party leader and raised in privilege. 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). Indeed, Xi's policy approach since becoming General Secretary bears some resemblance to Bo's, including a tough extralegal crackdown on perceived malefactors, a renewed emphasis on the state's role in the economy, and an emphasis on the primacy of the

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[10]We exclude military leaders because much less information has been disclosed on the crackdown within their ranks, aside from the highly public arraignment of General Xu Caihou.

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party and celebration of its traditions and achievements.

It is therefore surprising that our network analysis assigns Bo a rank much lower than his official position and public prominence would suggest. 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 view of the crackdown as primarily a power consolidation. Were this the case, we would have expected Xi to conclusively remove his greatest personal threat with 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). Yet he did not.

By contrast, the central figures of the network, Zhou Yongkang, Ling Jihua, and Su Rong, were powerful but were not viewed as direct competitors with Xi for leadership of the party. However, each of these three was known to have a strong network in one province. These were the three provinces whose top leadership was hardest hit by the corruption crackdown, those identified in section 3 as having departed most sharply from normal promotion practices. Su Rong was the Party Secretary of Jiangxi Province from 2007-2012. Zhou Yongkang served as Sichuan's Party Secretary for three years and maintained numerous close ties there even after being promoted to the central government level (Pei, 2016). Ling Jihua had deep connections in his native province of Shanxi (Pei, 2016).

To be sure, removing these men and their networks made Xi more powerful, and weakened any factions or individuals they might have supported. For instance, Ling Jihua was considered an important member of the Youth League faction to which Premier Li Keqiang also belonged, and Zhou Yongkang had been Bo Xilai's patron before his downfall. Nevertheless, the decision to arrest these three men and purge their networks while failing to do the same with Bo's network supports our interpretation of the crackdown as a reassertion of central party discipline over provincial actors who had become too independent.

4.3. *Integrating latent and actual connections*

In this section, we make use of this novel information about the actual ties between arrested officials and the three big tigers central to the arrest network, integrating this with the information about latent ties based on common background used in our earlier analysis. We find support for the importance of work and home ties, but not for school ties. Our results here also confirm the robustness of the previous findings regarding the protective effects of ties to a few key members of the Politburo Standing Committee.

4.3.1. *Estimation strategy*

Any measure of connections is imperfect. Data on educational, work, or geographic commonalities is comprehensive, but these are only proxies capturing potential bases for connection, not actual collusive relationships. We have greater confidence that the information about connections among indicted officials that we collected is accurate, but it is not comprehensive and it is subject to selection bias. 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 that incorporates both to predict the likelihood of arrest. 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 $\varepsilon_{1i} \sim N(0, 1)$.

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

Next let y_{2i}^* be the latent variable representing the propensity for that official to be 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 $cor(\varepsilon_1, \varepsilon_2) = \rho$.

$$(4.2) \qquad y_{2i}^* = \alpha_{2i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \gamma y_{1i}^* + \varepsilon_{2i}$$

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 $y_{1i}^* > 0$.

$$(4.3) \qquad y_{2i} \;=\; \mathbb{1}(y_{2i}^* > 0)$$
$$(4.4) \qquad y_{1i} \;=\; \mathbb{1}(y_{2i} = 1) * \mathbb{1}(y_{1i}^* > 0)$$

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 estimates the extent to which individuals connected to the big tigers are more likely to be indicted.

Given this data generating process, a naive single-equation probit model with disclosed connections among arrested officials 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.[11]

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[11]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

The above model is similar to the selection model suggested by (Heckman, 1979) and the bivariate probit 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 only after an investigation and indictment; however, investigation recursively depends on the connection. 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.[12]

4.3.2. *Results*

Our key results appear in Table VIII. The top half of the table shows the estimated coefficients from equation (4.1), which measure how strongly each of the three types of personal ties translate into actual connections. Home ties and work ties are both positively and highly significant predictors of actual connections with the three big tigers. Surprisingly, educational ties enter with a negative but non-significant coefficient.

These results provide 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, while the negative and significant relationship with school ties casts some doubt on the importance of this channel to connection. This may be idiosyncratic to these three individuals, however. The three big tigers attended less-prestigious universities, which provided fewer opportunities to build networks with other elites through school ties. Only 6% of the officials in the sample shared a school ties with any of these three. 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.

The bottom half of the table presents the coefficient estimates for equation (4.2),

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formally in the Appendix.

[12]Refer to Appendix for proof.

the predictors of indictment. These coefficients confirm our earlier results. Individuals with an educational, workplace, or home tie to Xi Jinping, Li Keqiang, or Yu Zhengsheng are less likely to be arrested, while connections to other CPSC members do not significantly affect this probability. The coefficient for tiger connections is our estimate for γ, capturing the extent to which having a connection to Zhou, Ling, or Su increases the odds of arrest. This is positive but not statistically significant. The corruption crackdown disproportionately affected officials affiliated with these three, but this analysis suggests we cannot rule out this being the result of chance. As in our previous analysis, central-level experience is associated with a lower probability of arrest. Interestingly, the association of SOE leadership with a higher probability of arrest is statistically significant in this analysis, unlike our results from Table VI.

The remaining specifications are presented for robustness, but do not differ substantially from the results in column (1). Column (2) drops school ties from equation (1) since they were estimated to have a negative relationship with personal connections. Column (3) also drops school ties from equation (2) for the same reason. Results are substantively similar across all of these specifications.

To recap, these results support the important of both workplace and geographical ties in forging connections within Chinese politics. They reinforce the importance of the three big tigers in the corruption network, although they do not allow us to rule out the null hypothesis that connections to them were irrelevant. They also confirm the findings of the previous section, that at least for this first phase of the crackdown, associates of both of China's top leaders were spared, but not others.

5. CONCLUSION

This paper shows that arrests in the first phase of Xi Jinping's anti-corruption crackdown were strongly associated with departures from standard promotion practices. This suggests that the crackdown was partly intended to reinforce existing practices that served both meritocratic and centralizing aims. This paper also shows that province-level officials were less likely to be arrested if they had previously worked in the central government or had personal ties to either of China's two top leaders. An

analysis of the network of corrupt officials finds that the most prominent individuals were ones with close ties to provinces with the sharpest departures from standard promotion practices.

Together, these results indicate that the crackdown was not primarily a factional purge, but was instead part of a broader reassertion of existing party practices and centralized control. To be sure, the arrest of Zhou Yongkang and other top leaders not closely allied with Xi removed potential obstacles to Xi's authority. Similarly, individuals appointed with Xi Jinping's approval to replace the fallen officials will have reason to be loyal to him. Combined with other institutional changes, this has given Xi a new level of personal power that undermines the relatively consensus-based governance that prevailed for most of China's post-Mao era. Our results, however, suggest that the initial crackdown may have served a set of goals shared more broadly by central party leadership, not just one man's will.

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

Variables	Obs	Mean	Std. Dev.	Min	Max
Age (age at the end of term)	536	52.35075	4.148203	38	61
Tenure (term length in months)	536	36.39739	16.11224	3	77
Gender (1=male; 0=female)	536	.9347015	.2472826	0	1
Position (1=prefectural party secretary; 0=city mayor)	536	.4440299	.4973216	0	1
Provincial capital city (1=Yes; 0=No)	536	.0652985	.2472826	0	1
Promotion (1=yes; 0=no)	536	.5503731	.4979208	0	1
investigated (1=yes; 0=no)	536	.1100746	.3132751	0	1
Relative GDP growth rate	536	-.0040265	1.493363	-4.74454	5.474319
Having worked for the Provincial General Office	536	.1511194	.3584998	0	1
Having worked other province-level units	536	.3768657	.4850535	0	1
Having worked in the Youth League (CYL) at provincial level or above	536	.1231343	.3288983	0	1
School ties (*tongxue*) with *any* Provincial PSC member	536	.2873134	.4529317	0	1
Hometown ties (*tongxiang*, same city) with *any* Provincial PSC member	536	.2723881	.4456044	0	1
Work ties (*tongshi*) with *any* Provincial PSC member	536	.5298507	.4995744	0	1

[a] This table reports the summary statistics of demographics, career experience, personal ties and local economic growth for prefectural-level (city) leaders. The sample contains only the leaders who served full terms between 2006 and 2012. Different spells in office by the same official are treated as separate observations. we drop the 12 observations with relative GDP growth rate in the top and bottom 1% and Aba, the epicenter of a catastrophic 2008 earthquake.

Table II: Promotion patterns at the prefectural level between 2006 and 2012 [a]

	D.V. Promotion (1=Yes; 0=No)	
	(1)	(2)
Relative GDP	0.0110	0.0155
	(0.0109)	(0.0108)
Provincial General Office	0.184**	0.142*
	(0.0730)	(0.0746)
Other Provincial Departments	0.0725	0.0642
	(0.0497)	(0.0474)
Provincial Youth League	0.193**	0.0314
	(0.0765)	(0.0768)
Ln(age)		-1.843***
		(0.252)
Position		-0.0657
		(0.0481)
Gender		-0.0163
		(0.114)
Ln(tenure)		-0.00153
		(0.0497)
Provincial Capital City		0.184*
		(0.105)
Constant	0.471***	7.826***
	(0.0321)	(0.955)
Provincial FE	Y	Y
Observations	536	536
R-squared	0.096	0.183

[a] Robust standard errors are given in parentheses, clustered at the provincial level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table III: Comparison of Promotion Patterns between Province Groups [a]

| | D.V. Promotion (1=Yes; 0=No) | | | | |
| | (1) | (2) | (3) | (4) | (5) |
	Low-arrest provinces	High-arrest provinces	Highest-arrest provinces	Low-arrest vs. High-arrest	Low-arrest vs. Highest-arrest
Relative GDP	0.0457**	-0.00142	-0.0322	0.0468**	0.0461**
	(0.0191)	(0.0152)	(0.0322)	(0.0180)	(0.0179)
Provincial General Office	0.232*	0.0857	-0.326*	0.203*	0.207*
	(0.116)	(0.0979)	(0.111)	(0.113)	(0.116)
Other Provincial Departments	0.0944	0.0269	-0.118	0.0908	0.0956
	(0.0656)	(0.0615)	(0.0759)	(0.0695)	(0.0699)
Provincial CYL	0.174*	-0.0649	-0.117	0.173*	0.181*
	(0.0917)	(0.114)	(0.195)	(0.0869)	(0.0989)
Ln(age)	-1.679***	-1.882***	-2.081**	-1.800***	-1.728***
	(0.370)	(0.343)	(0.294)	(0.261)	(0.352)
Position	-0.0871	-0.0575	-0.121	-0.0710	-0.0927
	(0.0695)	(0.0579)	(0.125)	(0.0459)	(0.0584)
Gender	-0.196*	0.0727	0.306	-0.0394	-0.0216
	(0.108)	(0.154)	(0.233)	(0.113)	(0.140)
Ln(tenure)	-0.0769*	0.0359	0.244	-0.00519	-0.00452
	(0.0404)	(0.0679)	(0.185)	(0.0451)	(0.0608)
Provincial Capital City	0.124	0.242	0.000435	0.185*	0.127
	(0.145)	(0.155)	(0.281)	(0.107)	(0.136)
Relative GDP * D[b]				-0.0487*	-0.0848**
				(0.0240)	(0.0384)
Provincial General Office * D				-0.111	-0.534**
				(0.142)	(0.182)
Other Provincial Departments * D				-0.0502	-0.226**
				(0.0898)	(0.0840)

Continued on next page

Table III − continued from previous page

	D.V. Promotion (1=Yes; 0=No)				
	(1)	(2)	(3)	(4)	(5)
	Low-arrest provinces	High-arrest provinces	Highest-arrest provinces	Low-arrest vs. High-arrest	Low-arrest vs. Highest-arrest
Provincial CYL * D				-0.261*	-0.500*
				(0.141)	(0.236)
Constant	7.580***	7.807***	7.784**	7.698***	7.409***
	(1.439)	(1.316)	(1.027)	(1.000)	(1.364)
Province FE	Y	Y	Y	Y	Y
Observations	239	297	83	536	322
R-squared	0.305	0.120	0.203	0.195	0.255

[a] Robust standard errors are given in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

[b] D is a dummy which equals one if the province belongs to the "High-arrest" or "Highest-arrest" groups as indicated in the specification.

Table IV: Provincial Indictments and Promotion Errors[a]

	D.V. Ln(Number of provincial-level downfalls+1)			
	(1)	(2)	(3)	(4)
Average error of promotion cases	2.897***		3.036***	
	(0.958)		(0.922)	
Average error of non-promotion cases		-1.652	0.610	
		(1.998)	(1.427)	
Average error of all cases				-0.0849
				(3.540)
Constant	0.198	2.074**	-0.150	1.309
	(0.340)	(0.961)	(0.798)	(1.525)
Observations	24	25	24	25
R-squared	0.220	0.035	0.225	0.000

[a] We follow the second model specification of Table II, using all provinces to obtain point estimates. The estimates then are applied to all individual prefecture leaders to calculate the predicted errors. Provincial dummies are added to calculate coefficients but not used for generating predicted errors. The errors are calculated from the full-sample regressions. For promotion cases, predicted errors are $(1 - \mathbf{xb})$; for non-promotion cases, are $(\mathbf{xb} - 0)$. Robust standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table V: Probability of Being Indicted for Prefectural-city Leaders [a]

	(1) All	(2) Non-Promoted	(3) Promoted	(4) Interaction with Promotion
		D.V. Being Indicted (1=Yes; 0=No)		
promotion	0.0397			2.646**
	(0.0315)			(1.199)
Relative GDP		0.0240	-0.0121	0.0263**
		(0.0144)	(0.00963)	(0.0121)
Provincial General Office		0.0816	-0.0280	0.0739
		(0.0872)	(0.0417)	(0.0933)
Other Provincial Departments		-0.0224	0.0337	-0.0426
		(0.0364)	(0.0515)	(0.0343)
Provincial Youth League		-0.00939	0.0675	0.0103
		(0.0941)	(0.0561)	(0.0867)
Ln(age)		0.921**	0.307	0.878***
		(0.361)	(0.325)	(0.253)
Ln(tenure)		0.0853	-0.00289	0.0549
		(0.0673)	(0.0342)	(0.0633)
Gender		0.00251	0.130***	0.0627
		(0.0490)	(0.0242)	(0.0648)
Position		0.0122	-0.0312	0.0183
		(0.0454)	(0.0383)	(0.0441)
Provincial Capital City		-0.0828	0.0614	-0.0531
		(0.0837)	(0.0940)	(0.0856)
Relative GDP * Promotion				-0.0352**
				(0.0152)
Provincial General Office * Promotion				-0.105
				(0.112)
Other Provincial Departments * Promotion				0.0875
				(0.0592)
Youth League * Promotion				0.0479
				(0.109)
Ln(age)*Promotion				-0.622*
				(0.317)
Ln(tenure)*Promotion				-0.0549
				(0.0537)
Gender*Promotion				0.0460
				(0.0684)
Position*Promotion				-0.0432
				(0.0528)
Provincial Capital City*Promotion				0.134

Table V – continued from previous page

	D.V. Being Indicted (1=Yes; 0=No)			
	(1)	(2)	(3)	(4)
	All	Non-Promoted	Promoted	Interaction with Promotion
				(0.132)
Age60		-0.194**	-0.220**	-0.213***
		(0.0704)	(0.0990)	(0.0486)
Constant	0.0866***	-3.866***	-1.193	-3.637***
	(0.0183)	(1.356)	(1.242)	(0.904)
Provincial FE	Y	Y	Y	Y
Observations	474	198	276	474
R-squared	0.058	0.213	0.148	0.123

[a] Robust standard errors are given in parentheses, clustered at the provincial level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

[b] Age60 indicates if the prefectural-city leader was over 60 years old by 2013.

Table VI: Connections to Politburo Standing Committee and Likelihood of
Indictment for Provincial Standing Committee Members [a]

	Indicted			
	(1)	(2)	(3)	(4)
Connected to				
Any CPSC member	-0.0148	-0.0142		
	(0.0356)	(0.0347)		
CPSC members other than Xi and Li			0.00865	0.00852
			(0.0361)	(0.0357)
Xi Jinping			-0.112***	-0.116***
			(0.0264)	(0.0293)
Li Keqiang			-0.0935***	-0.0880***
			(0.0293)	(0.0305)
Administrative Rank		-0.0486		-0.0509
		(0.0439)		(0.0454)
Ln(age)		-0.0889		-0.0925
		(0.269)		(0.265)
Central-level experience		-0.0770***		-0.0750***
		(0.0215)		(0.0212)
SOE experience		0.0980		0.0920
		(0.0663)		(0.0660)
CYL experience		0.0229		0.0273
		(0.0327)		(0.0350)
Constant	0.0899***	0.458	0.112***	0.494
	(0.0203)	(1.073)	(0.0233)	(1.054)
Observations	322	322	322	322
R-squared	0.001	0.037	0.031	0.066

[a] Linear Probability Model is adopted. Robust standard errors are given in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1. The overall political connection is a dummy that equals 1 if any of the following connections hold: having graduated from the same university with any PPSC member (*Tongxue*); being born in the same prefectural city with any PPSC member (*Tongxiang*); having overlapping work experience with any PPSC member (*Tongshi*).

Table VII: Highest-ranked Officials in The Indicted 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] Author's calculation.

Table VIII: A Recursive Probit Model: The Political Connections and Indict-
ments of 2012-provincial Standing Committee Members [a]

	(1)	(2)	(3)
Equation (4.1): D.V. Connecting to Tigers (1 or 0)			
Proxies of connection to tigers (β_1):			
Tongxue (school ties) with Zhou/Ling/Su	-2.715		
	(1.737)		
Tongxiang (home ties, same province) with Zhou/Ling/Su	1.641***	1.476**	1.355**
	(0.520)	(0.617)	(0.560)
Tongshi (work ties) with Zhou/Ling/Su	2.686***	2.585**	2.345**
	(0.973)	(1.218)	(0.946)
Constant	-1.541	-1.744*	-1.940***
	(1.568)	(1.023)	(0.519)
Equation (4.2): D.V. Being Indicted in the First Anti-corruption Wave (1 or 0)			
Proxies of connections to Central Politburo Standing Committee members (β_2):			
Tongxue (school ties) with Xi/Li/Yu	-5.564***	-5.312***	
	(1.508)	(0.961)	
Tongxiang (home ties, same province) with Xi/Li/Yu	-5.815***	-5.668***	-5.966***
	(1.343)	(0.949)	(0.958)
Tongshi (work ties) with Xi/Li/Yu	-1.169*	-1.184**	-1.188**
	(0.604)	(0.506)	(0.516)
Tongxue (school ties) with other CPSC members	0.614	0.484	
	(0.808)	(0.967)	
Tongxiang (home ties, same province) with other CPSC members	0.467	0.472	0.432
	(0.294)	(0.298)	(0.343)
Tongshi (work ties) with other CPSC members	0.103	-0.117	-0.214
	(0.721)	(0.700)	(0.620)
Ln(age)	-0.844	-0.614	-0.304
	(2.320)	(2.233)	(2.072)
Central-level experience	-1.315***	-1.326***	-1.454***
	(0.451)	(0.377)	(0.374)
CYL experience	0.265	0.153	0.164
	(0.335)	(0.313)	(0.321)
Administrative Rank	-0.652	-0.617	-0.683
	(0.546)	(0.502)	(0.547)
SOE experience	0.783**	0.744**	0.704*
	(0.362)	(0.379)	(0.403)
Constant	2.271	1.395	0.188
	(9.126)	(8.776)	(8.130)
Connection to a big tiger (γ)	0.279	0.198	0.248

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	(1)	(2)	(3)
	(0.170)	(0.174)	(0.204)
ρ	0.366	0.693	1.031
	(1.372)	(1.301)	(0.874)
Log pseudo-likelihood	-80.704	-81.839	-83.494
Observations	322	322	322

Table VIII – continued from previous page

[a] The Recursive Probit Model and full-sample MLE are adopted. Robust standard errors are provided in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

FIGURE 1.— Number of Indicted Officials at the Provincial Level.
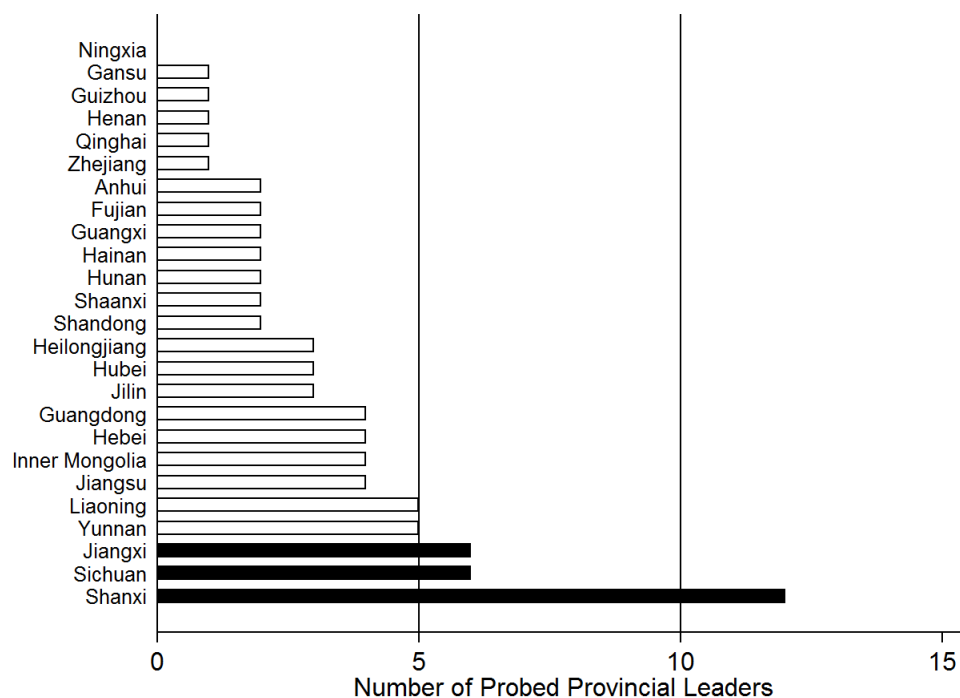
Source: The Central Discipline Inspection Commission.

Notes: This figure arranges the provinces in order of the number of indicted provincial leaders.

FIGURE 2.— Predicted promotion odds versus actual outcomes
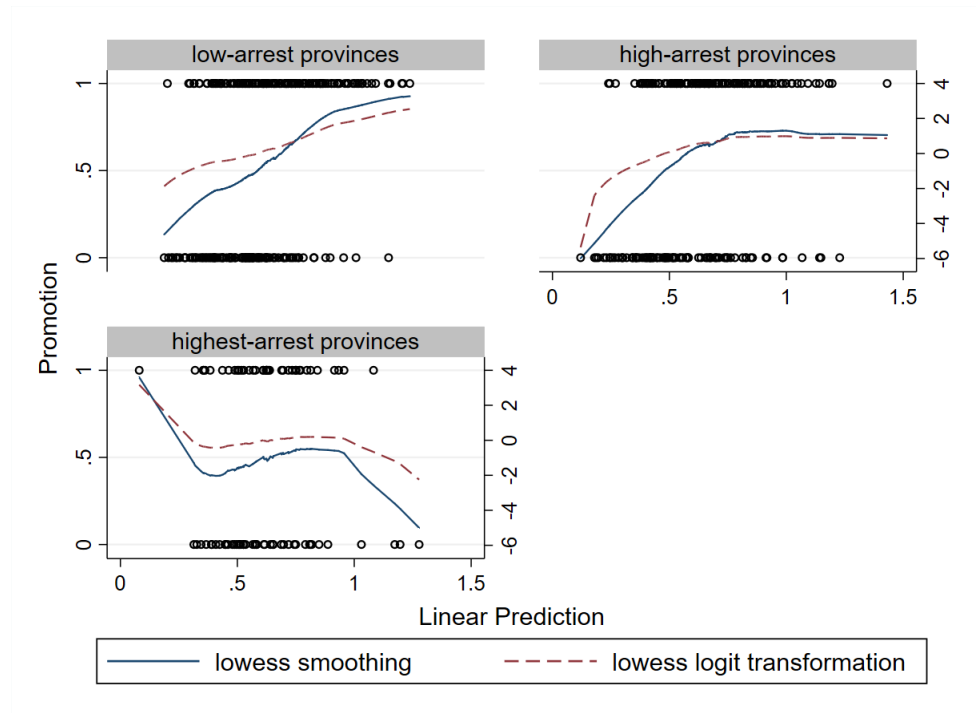
Notes: This figure uses predicted promotion odds using coefficients derived from low-arrest provinces as the benchmark (Table III, column 1). The estimates then are applied to all individual prefectural-city leaders to get their predicted promotion odds. The actual promotion outcomes are placed on the vertical axis and the linear predictions are placed on horizontal axis.

FIGURE 3.— Network of Reported Connections Among Indicted Officials.

Ni,Fake

Ling,Jihua

Ling,Zhengce

Su,Rong

Bo,Xilai

Bai,Enpei

Jiang,Jiemin

Zhou,Yongkang

Wan,Qingliang

Li,Chongxi

Li,Chuncheng
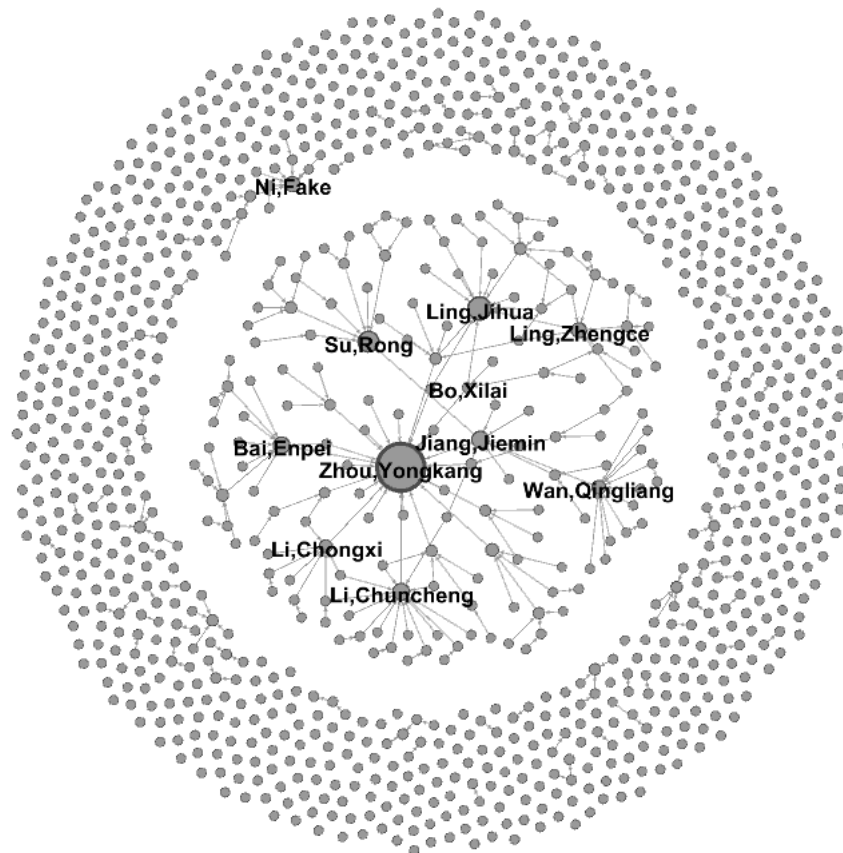
Sources: The Central Discipline Inspection Commission, other public documents and media.

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).

APPENDIX: IDENTIFICATION OF THE RECURSIVE SELECTION MODEL,
MORE TABLES AND FIGURES

The recursive probit model is

$$y_{1i}^* = \beta_1 x_{1i} + \epsilon_{1i}$$

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

(1) $\quad y_{2i} = \mathbf{1}(y_{2i}^* > 0)$

$$y_{1i} = \mathbf{1}(y_{1i}^* > 0)\mathbf{1}(y_{2i}^* > 0)$$

$$\epsilon_{1i} \sim N(0,1), \epsilon_{2i} \sim N(0,1), cor(\epsilon_{1i}, \epsilon_{2i}) = \rho$$

In the Heckman selection model, or a standard bi-probit model without
recursion, the equation of selection (the second one) can be estimated inde-
pendently 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

(2) $\quad y_{2i}^* = \gamma\beta_1 x_{1i} + \beta_2 x_{2i} + \gamma\epsilon_{1i} + \epsilon_{2i}$

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

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

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

$$y_{1i}^* = \beta_1 x_{1i} + \epsilon_{1i}$$

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

(4) $\quad y_{2i} = \mathbf{1}(y_{2i}^* > 0)$

$$y_{1i} = \mathbf{1}(y_{1i}^* > 0)\mathbf{1}(y_{2i}^* > 0)$$

$$v_{1i} \sim N(0,1), v_{2i} \sim N(0,1), cor(v_{1i}, v_{2i}) = (\rho + \gamma)/C$$

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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.

Appendix Table I: Comparison of Promotion Patterns across
Provinces with more interactions [a]

	D.V. Promotion (1=Yes; 0=No)	
	(1)	(2)
	Lowest-arrest provinces vs. High-arrest provinces	Lowest-arrest provinces vs. Highest-arrest provinces
Relative GDP	0.0457**	0.0457**
	(0.0186)	(0.0191)
Provincial General Office	0.232*	0.232*
	(0.113)	(0.116)
Other Provincial Departments	0.0944	0.0944
	(0.0640)	(0.0656)
Provincial CYL	0.174*	0.174*
	(0.0894)	(0.0917)
Ln(Age)	-1.679***	-1.679***
	(0.360)	(0.370)
Position	-0.0871	-0.0871
	(0.0678)	(0.0695)
Gender	-0.196*	-0.196*
	(0.105)	(0.108)
Ln(tenure)	-0.0769*	-0.0769*
	(0.0394)	(0.0404)
Provincial Capital City	0.124	0.124
	(0.141)	(0.145)
Relative GDP * D [b]	-0.0471*	-0.0779**
	(0.0239)	(0.0328)
Provincial General Office * D	-0.146	-0.558***
	(0.148)	(0.148)
Other Provincial Departments * D	-0.0674	-0.212**
	(0.0881)	(0.0909)
Provincial CYL * D	-0.239	-0.292

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	(1)	(2)
	D.V. Promotion (1=Yes; 0=No)	
	Lowest-arrest provinces vs.	Lowest-arrest provinces vs.
	High-arrest provinces	Highest-arrest provinces
	(0.143)	(0.186)
Ln(age) * D	-0.203	-0.402
	(0.494)	(0.443)
Gender * D	0.268	0.502**
	(0.184)	(0.221)
Ln(tenure) * D	0.113	0.321*
	(0.0775)	(0.158)
Position * D	0.0295	-0.0343
	(0.0885)	(0.125)
Provincial Capital City * D	0.119	-0.123
	(0.208)	(0.274)
Constant	7.706***	7.632***
	(0.952)	(1.091)
Provincial FE	Y	Y
Observations	536	322
R-squared	0.203	0.282

[a] Linear Probability Model is adopted. Robust standard errors are given in parentheses, clustered at the provincial level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

[b] D is a dummy which equals one if the province belongs to the "High-arrest" or "Highest-arrest" groups, i.e., it has more than one provincial leaders being indicted.

Appendix Table II: Comparison of Promotion Patterns across Provinces with

Interactions with More Indices [a]

	D.V. Promotion (1=Yes; 0=No)					
	(1)	(2)	(3)	(4)	(5)	(6)
	6-value index[b]		Indictment index		Ln(Indictment index)	
Relative GDP	0.0466*	0.0439	0.0284	0.0289	0.0523	0.0493
	(0.0271)	(0.0285)	(0.0206)	(0.0206)	(0.0365)	(0.0381)
Provincial General Office	0.353**	0.385***	0.278***	0.337***	0.396**	0.464***
	(0.126)	(0.127)	(0.0944)	(0.0993)	(0.150)	(0.161)
Other Provincial Departments	0.103	0.101	0.128*	0.142*	0.143	0.153
	(0.0898)	(0.0855)	(0.0739)	(0.0791)	(0.113)	(0.117)
Provincial CYL	0.196	0.170	0.100	0.0779	0.190	0.159
	(0.138)	(0.130)	(0.111)	(0.110)	(0.175)	(0.176)
Ln(age)	-1.814***	-1.433**	-1.835***	-1.486***	-1.835***	-1.230
	(0.261)	(0.567)	(0.257)	(0.481)	(0.258)	(0.867)
Position	-0.0705	-0.0954	-0.0695	-0.0501	-0.0710	-0.108
	(0.0470)	(0.0917)	(0.0478)	(0.0832)	(0.0473)	(0.131)
Gender	-0.0386	-0.331**	-0.00890	-0.249**	-0.0219	-0.420**
	(0.108)	(0.157)	(0.123)	(0.117)	(0.116)	(0.192)
Ln(tenure)	-0.00531	-0.101	-0.00403	-0.0478	-0.00346	-0.0942
	(0.0479)	(0.0887)	(0.0497)	(0.0816)	(0.0488)	(0.107)
Provincial Capital City	0.189*	0.227	0.189*	0.194	0.190*	0.292
	(0.105)	(0.191)	(0.106)	(0.149)	(0.107)	(0.214)
Relative GDP * Index	-0.00971	-0.00895	-0.00394	-0.00408	-0.0265	-0.0248
	(0.00743)	(0.00754)	(0.00532)	(0.00538)	(0.0251)	(0.0258)

Continued on next page

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	(1)	(2)	(3)	(4)	(5)	(6)
		D.V. Promotion (1=Yes; 0=No)				
	6-value index[b]		Indictment index		Ln(Indictment index)	
Provincial General Office * Index	-0.0708*	-0.0790**	-0.0431**	-0.0627***	-0.197*	-0.246**
	(0.0382)	(0.0366)	(0.0204)	(0.0208)	(0.109)	(0.115)
Other Provincial Departments * Index	-0.0151	-0.0169	-0.0213	-0.0290	-0.0650	-0.0801
	(0.0229)	(0.0222)	(0.0137)	(0.0174)	(0.0763)	(0.0817)
Provincial CYL * Index	-0.0575	-0.0442	-0.0238	-0.0139	-0.126	-0.0926
	(0.0429)	(0.0386)	(0.0263)	(0.0229)	(0.128)	(0.128)
Ln(Age) * Index		-0.130		-0.119		-0.475
		(0.176)		(0.128)		(0.630)
Position * Index		0.00834		-0.00549		0.0286
		(0.0228)		(0.0171)		(0.0887)
Gender * Index		0.0879*		0.0649***		0.283*
		(0.0459)		(0.0230)		(0.138)
Ln(tenure) * Index		0.0305		0.0136		0.0688
		(0.0292)		(0.0247)		(0.0891)
Provincial Capital City * Index		-0.0154		-0.00302		-0.0847
		(0.0620)		(0.0407)		(0.170)
Constant	7.758***	7.882***	7.810***	8.069***	7.818***	7.992***
	(0.998)	(0.962)	(0.977)	(0.937)	(0.979)	(0.929)
Province FE	Y	Y	Y	Y	Y	Y
Observations	536	536	536	536	536	536

Appendix Table II − continued from previous page

	(1)	(2)	(3)	(4)	(5)	(6)
	D.V. Promotion (1=Yes; 0=No)					
	6-value index[b]		Indictment index		Ln(Indictment index)	
R-squared	0.192	0.201	0.189	0.198	0.190	0.197

[a] Linear Probability Model is adopted. Robust standard errors are given in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

[b] The 6-value index is coded as 1 if the province has no more than 1 provincial leader being indicted; 2 to 5 respectively if the province has that number of provincial leaders being indicted; 6 if the province has no less than 6 provincial leaders being indicted.

[c] The indictment index just takes the actual number of indictments of provincial leaders. Please refer to Figure 3 for the actual numbers.

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Appendix Table III: Comparison of Promotion Patterns with connections to
PPSC members [a]

	D.V. Promotion (1=Yes; 0=No)				
	(1)	(2)	(3)	(4)	(5)
	Low-arrest provinces	High-arrest provinces	Highest-arrest provinces	Low-arrest vs. High-arrest	Low-arrest vs. Highest-arrest
Relative GDP	0.0412*	-0.00150	-0.0189	0.0433**	0.0427*
	(0.0212)	(0.0154)	(0.0153)	(0.0203)	(0.0201)
Provincial General Office	0.210*	0.0898	-0.353	0.183*	0.184
	(0.104)	(0.103)	(0.133)	(0.106)	(0.107)
Other Provincial Departments	0.109	0.0247	-0.0954	0.102	0.107
	(0.0610)	(0.0623)	(0.129)	(0.0656)	(0.0658)
Provincial CYL	0.147	-0.0683	-0.140	0.154	0.155
	(0.0980)	(0.114)	(0.192)	(0.0920)	(0.104)
$Tongxue$[b]	-0.0737	0.00583	0.209	-0.0584	-0.0629
	(0.0767)	(0.0680)	(0.0747)	(0.0770)	(0.0796)
$Tongxiang$[c]	-0.0333	-0.0180	0.0964	-0.0316	-0.0348
	(0.0763)	(0.0420)	(0.0844)	(0.0749)	(0.0774)
$Tongshi$[d]	0.128	-0.0201	0.0321	0.106	0.110
	(0.0750)	(0.0765)	(0.137)	(0.0763)	(0.0778)
Ln(age)	-1.726***	-1.874***	-2.531**	-1.812***	-1.803***
	(0.355)	(0.359)	(0.465)	(0.262)	(0.352)
Position	-0.0897	-0.0548	-0.121	-0.0700	-0.0928
	(0.0656)	(0.0579)	(0.122)	(0.0452)	(0.0572)
Gender	-0.227*	0.0682	0.348	-0.0540	-0.0367

Continued on next page

Appendix Table III – continued from previous page

	(1)	(2)	(3)	(4)	(5)
		D.V. Promotion (1=Yes; 0=No)			
	Low-arrest provinces	High-arrest provinces	Highest-arrest provinces	Low-arrest vs. High-arrest	Low-arrest vs. Highest-arrest
	(0.120)	(0.167)	(0.254)	(0.123)	(0.155)
Ln(tenure)	-0.0887*	0.0332	0.315	-0.0112	-0.00629
	(0.0416)	(0.0701)	(0.192)	(0.0467)	(0.0659)
Provincial Capital City	0.0848	0.241	-0.0983	0.168	0.0915
	(0.135)	(0.156)	(0.210)	(0.105)	(0.129)
Relative GDP * D^e				-0.0457*	-0.0775**
				(0.0261)	(0.0345)
Provincial General Office * D				-0.0838	-0.520**
				(0.139)	(0.203)
Other Provincial Departments * D				-0.0636	-0.229**
				(0.0865)	(0.101)
Provincial CYL * D				-0.248*	-0.487*
				(0.145)	(0.261)
Tongxue * D				0.0615	0.182*
				(0.102)	(0.0907)
Tongxiang * D				0.0123	0.0748
				(0.0849)	(0.0938)
Tongshi * D				-0.138	-0.155
				(0.104)	(0.124)
Constant	7.805***	7.802***	9.162**	7.778***	7.700***
	(1.403)	(1.349)	(1.593)	(1.001)	(1.373)

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Appendix Table III – continued from previous page

	D.V. Promotion (1=Yes; 0=No)				
	(1)	(2)	(3)	(4)	(5)
	Low-arrest provinces	High-arrest provinces	Highest-arrest provinces	Low-arrest vs. High-arrest	Low-arrest vs. Highest-arrest
Provincial FE	Y	Y	Y	Y	Y
Observations	239	297	83	536	322
R-squared	0.322	0.120	0.237	0.201	0.268

[a] Linear Probability Model is adopted. Robust standard errors are given in parentheses, clustered at the provincial level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

[b] *Tongxue*: having graduated from the same university with any PPSC member.

[c] *Tongxiang*: being born in the same prefectural city with any PPSC member.

[d] *Tongshi*: having overlapping work experience with any PPSC member.

[e] D is a dummy which equals one if the province belongs to the "High-arrest" or "Highest-arrest" groups, i.e., it has more than one provincial leaders being indicted.

Appendix Table IV: Correlation between The Number of Provincial indictments and The Predicted Error of Promotion [a]

	D.V. Number of provincial-level indictments			
	(1)	(2)	(3)	(4)
Average error of promotion cases	13.72**		13.90**	
	(6.373)		(5.845)	
Average error of non-promotion cases		-6.977	0.791	
		(9.073)	(7.024)	
Average error of all cases				6.143
				(11.54)
Constant	-2.087	6.510	-2.539	0.393
	(2.194)	(4.610)	(3.515)	(4.935)
Observations	24	25	24	25
R-squared	0.196	0.030	0.197	0.014

[a] We follow the second model specification of Table 2 and use all provinces to obtain point estimates. The estimates then are applied to all individual prefectural-city leaders to calculate the predicted errors. Provincial dummies are added to calculate coefficients but not used for generating predicted errors. The errors are calculated from the full-sample regressions. Provincial dummies are added to calculate coefficients but not used for generating predicted errors. For promotion cases, predicted errors are $(1 - \mathbf{xb})$; for non-promotion cases, are $(\mathbf{xb} - 0)$. Robust standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

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

Variables	Obs	Mean	Std. Dev.	Min	Max
Age (age at the end of term)	474	52.51266	4.130642	38	61
Tenure (term length in months)	474	37.76582	15.93466	3	77
Gender (1=male; 0=female)	474	0.938819	0.239916	0	1
Position (1=prefectural party secretary; 0=city mayor)	474	0.436709	0.496502	0	1
If provincial capital city (1=Yes; 0=No)	474	0.07384	0.261786	0	1
Promotion (1=yes; 0=no)	474	0.582279	0.493705	0	1
Being investigated (1=yes; 0=no)	474	0.109705	0.312851	0	1
Relative GDP growth rate	474	-0.0729	1.482932	-4.74454	5.469666
Having worked for the Provincial General Office	474	0.14346	0.350912	0	1
Having worked other province-level units & 536 & .3768657	474	0.377637	0.485308	0	1
Having worked in the Youth League (CYL) at provincial level or above	474	0.120253	0.325601	0	1
School ties (\textit{tongxue}) with \textit{any} Provincial PSC member	474	0.28481	0.451801	0	1
Hometown ties (\textit{tongxiang}, same city) with \textit{any} Provincial PSC member	474	0.265823	0.442237	0	1
Work ties (\textit{tongshi}) with \textit{any} Provincial PSC member	474	0.512658	0.500368	0	1

[a] This table reports the summary statistics of demographics, career experience, personal ties and local economic growth for prefectural-level (city) leaders. The sample contains only the city leaders who served full terms between 2006 and 2012. For the officials who served for multiple positions, we keep the term with the largest predicted promotion error for use (following the second model specification in Table 2, benchmarked with the result of the Lowest-arrest provinces). Observations with relative GDP performance as the top an bottom 1% are dropped. The prefectural city of Aba(zhou) is excluded due to the 2008 Sichuan earthquake.

Appendix Table VI: Summary Statistics: Indictments, Personal ties, and Demographics of The 2012-Provincial Politburo Standing Committee Members (PPSC)

	Obs	*Tongxue*	*Tongxiang*[a]	*Tongshi*	Overall[b]
Mean of binary indices - connecting with Politburo Standing Committee Members					
connected to					
Xi Jinping	322	0.019	0.043	0.068	0.127
Li Keqiang	322	0.040	0.050	0.102	0.183
Yu Zhengsheng	322	0	0.056	0.043	0.099
Zhang Dejiang	322	0	0.050	0.056	0.106
Zhang Gaoli	322	0	0.031	0.059	0.090
Wang Qishan	322	0.022	0.040	0.003	0.062
Liu Yunshan	322	0	0.056	0.043	0.090
Mean of binary indices - connecting with big tigers (deputy national leaders)					
connected to					
Zhou Yongkang	322	0	0.062	0.068	0.130
Ling Jihua	322	0.006	0.043	0.037	0.084
Su Rong	322	0.056	0.012	0.127	0.158

Other Variables	Obs	Mean	Std. Dev.	Min	Max
Being indicted by Oct. 2015	322	0.084	0.278	0	1
Being reported to connect with any big tiger	322	0.053	0.224	0	1
Administrative rank [c]	322	0.211	0.409	0	1
Age	322	54.919	3.991	44	65
Central-level work experience	322	0.224	0.417	0	1
SOE leadership experience	322	0.087	0.282	0	1
CYL experience	322	0.283	0.451	0	1

[a] *Tongxiang* is defined as a PPSC member sharing origin (same province) with a PSC member or a big tiger. *Tongxue* and *Tongshi* follow the same definitions as before.

[b] As long as a PPSC member is connected to a PSC member or a big tiger, the overall connection is equal to 1. Numerically, the value is the maximum of *Tongxue Tongxiang* and *Tongshi*.

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

Appendix Table VII: Connections to Politburo Standing Committee Members and Likelihood of Indictment for Provincial Standing Committee Members [a]

|	D.V. Being Indicted in the First Anti-corruption Wave (1=Yes; 0=No)	
	(1)	(2)
Connected to		
Xi Jinping	-0.0945***	-0.0961***
	(0.0208)	(0.0244)
Li Keqiang	-0.0965***	-0.0891***
	(0.0297)	(0.0317)
Yu Zhensheng	-0.0856***	-0.107***
	(0.0237)	(0.0223)
Zhang Dejiang	0.00757	-0.00687
	(0.0525)	(0.0544)
Zhang Gaoli	0.0237	0.0333
	(0.0481)	(0.0486)
Wang Qishan	0.0880**	0.0724*
	(0.0408)	(0.0399)
Liu Yunshan	0.0455	0.0731
	(0.0831)	(0.0856)
Administrative Rank		-0.0414
		(0.0450)
Ln(age)		-0.151
		(0.259)
Central-level experience		-0.0897***
		(0.0203)
SOE experience		0.103
		(0.0644)
CYL experience		0.0302
		(0.0364)
Constant	0.110***	0.725
	(0.0227)	(1.028)
Observations	322	322
R-squared	0.051	0.094

[a] Linear Probability Model is adopted. Robust standard errors are given in parentheses, clustered at the provincial level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The overall political connection is a dummy that equals 1 if any of the following connections hold: having graduated from the same university with any PPSC member (*Tongxue*); being born in the same prefectural city with any PPSC member (*Tongxiang*); having overlapping work experience with any PPSC member (*Tongshi*).

Appendix Table VIII: The Connection Proxies and Indictments of The 2012-Provincial Standing Committee Members [a]

| | D.V. Being Indicted in the First Anti-corruption Wave (1=Yes; 0=No) | | |
| | (1) | (2) | (3) |
	Tongxue	Tongxiang	Tongshi
Connection to			
Xi Jinping	-0.0854***	-0.116***	-0.0967***
	(0.0288)	(0.0293)	(0.0285)
Li Keqiang	-0.0709***	-0.0898***	-0.0638
	(0.0247)	(0.0271)	(0.0521)
Yu Zhengsheng	-	-0.121***	-0.117***
		(0.0257)	(0.0314)
Zhang Dejiang	-	-0.0201	-0.0500
		(0.0652)	(0.0856)
Zhang Gaoli	-	-0.0862***	0.0897
		(0.0216)	(0.0688)
Wang Qishan	0.0591	0.0803	-0.121***
	(0.134)	(0.166)	(0.0304)
Liu Yunshan	-	0.138	-0.0688*
		(0.177)	(0.0349)
Administrative Rank	-0.0436	-0.0430	-0.0536
	(0.0463)	(0.0436)	(0.0467)
Ln(age)	-0.134	-0.138	-0.0564
	(0.287)	(0.254)	(0.272)
Central-level experience	-0.0739***	-0.0864***	-0.0761***
	(0.0209)	(0.0235)	(0.0236)
SOE experience	0.0969	0.109*	0.0949
	(0.0676)	(0.0636)	(0.0677)
CYL experience	0.0227	0.0197	0.0260
	(0.0341)	(0.0348)	(0.0404)
Constant	0.633	0.658	0.341
	(1.138)	(1.009)	(1.076)
Observations	322	322	322
R-squared	0.042	0.089	0.061

[a] Linear Probability Model Model is adopted. Robust standard errors are given in parentheses, clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1. This table is differentiated from Table 7 that political connections are measure by each of the connection proxies respectively.

APPENDIX FIGURE 1.— Distribution of Relative GDP Growth of Prefectural-city Leaders between 2006 and 2012
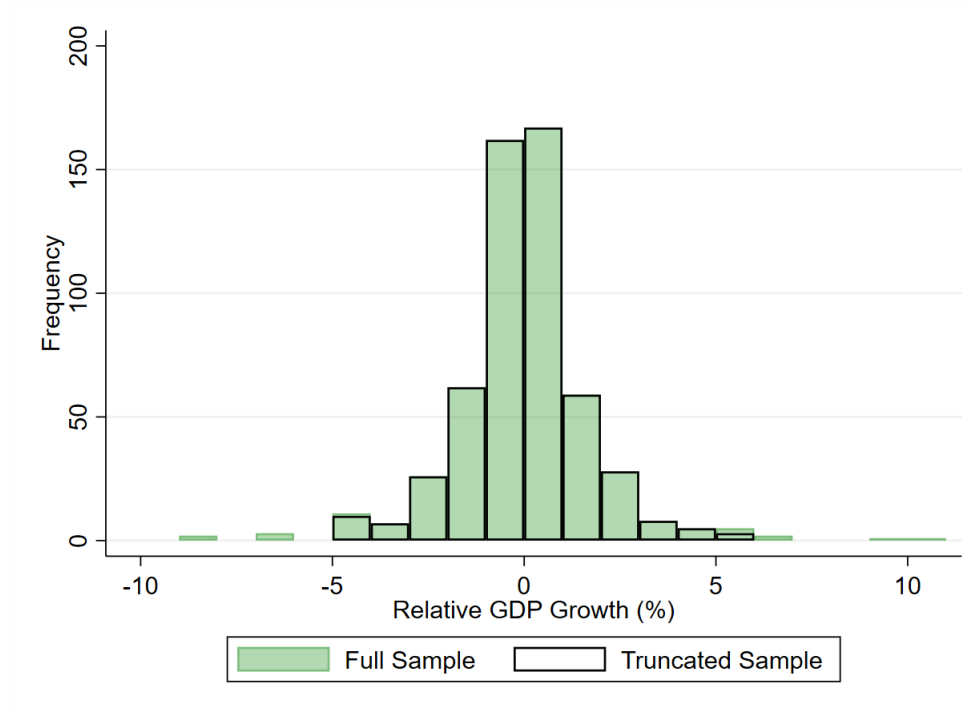
Notes: This figure illustrates how relative GDP performance is distributed across the prefectural-city leaders before the anti-corruption campaign. For empirical use, observations of the top 1% and bottom 1% (12 observations in total) are dropped. Beijing, Shanghai, Tianjin, Chongqing (the directly-controlled municipalities), Xinjiang and Xizang (Tibet) are excluded. Aba(zhou) is also excluded due to major negative shock caused by the 2008 Sichuan earthquake.