

# The Promotion Club

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## Abstract

How can principals incentivize agents' efforts while maintaining personnel flexibility? We propose a two-stage mechanism called the "promotion club": the principal commits to first select a subset of best-performing agents into a club, and then promotes one from within this club based on principal's personal, performance-independent discretions. Promotion club outperforms tournament in both efforts and personnel flexibility when there are many homogenous agents, and when intra-crony competitions are strong. We use promotion data of officials in hierarchical governments to validate the existence of promotion clubs in real-life organizations. The observed regional and hierarchical variations corroborate model predictions.

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# 1. Introduction

Tournament is one of the most important incentive schemes used in organizations, where the principal adopts relative performance evaluations and the agents compete in efforts for the promotion rewards (Lazear and Rosen, 1981).<sup>1</sup> Seminal works have empirically validated that better performance led to higher rewards in corporations (Gibbons and Murphy, 1990; Main *et al.*, 1993) and higher promotion probabilities in governments (Li and Zhou, 2005; Bertrand *et al.*, 2020). Furthermore, the high-powered incentives provided by tournaments can be a key determinant in the development of a country (Xu, 2011; Khan *et al.*, 2019).

However, the tournament approach has a significant drawback: the commitment to promote the best-performing agent distorts discretionary power in personnel selection. In reality, principals may prioritize discretion in promotion to recruit cronies for political survival (Egorov and Sonin 2011; Shih, Adolph, and Liu 2012; Zakharov 2016; Bai and Zhou 2019), personal benefits (Xu, 2019) or to balance among the multiple objectives (Holmstrom and Milgrom 1991).<sup>2</sup> Existing literature often recognizes performance and discretions as two irreconcilable substitutes in promotion decisions (e.g. Li and Zhou 2005 vs. Opper and Brehm 2007). Is it possible that principals can motivate working incentives and retain personnel flexibility at the same time? This paper provides an affirmative answer, by proposing and validating a simple incentive scheme, called the *promotion club*.

The promotion club scheme takes two stages. In the first stage, the principal (she) commits to select, from  $n$  agents (he, them),  $m$  top-performing candidates into a club. In the second stage, she promotes one from within this club based on her discretion, i.e., effort-independent preferences, such as personality, ideology, religion, *etc.* The preferences are private information before club formation, but are known to the

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<sup>1</sup> See also: Bull, Schotter, and Weigelt 1987; Main, O'Reilly, and Wade 1993; Maskin, Qian, and Xu 2000; Boudreau, Lakhani, and Menietti 2016; Ekinci, Kauhanen, and Waldman 2018; Wang and Zheng 2018; Khan, Khwaja, and Olken 2019.

<sup>2</sup> For instance, a government official faces objectives of environmental protection and social stabilities in addition to economic performance; and a corporate manager faces objectives of social corporate responsibility in addition to revenues and profits.

principal once agents are in the club. Therefore, the first stage incentivizes efforts – agents compete to enter the club. And the second stage provides personnel flexibility – the principal can select her most preferred agents from the top-performing candidates. The club scheme also accommodates standard tournament ( $m = 1$ ) and extreme cronyism ( $m = n$ ) as its special cases. Intuitively, a larger club size generates higher personnel flexibilities.

Our key theoretical result shows that agent’s average effort curve features an inverted- $U$  shape with respect to club size ( $m$ ) for a given agent population ( $n$ ). The intuition is as follows: As the club size enlarges, the probability of getting into the club increases, but the probability of being selected from the club decreases. The joint effects contribute to the inverted- $U$  shaped effort curve.<sup>3</sup> More importantly, when the curve slopes upward, the promotion club scheme completely mitigates the effort–discretion tradeoff: increasing the club size both incentivizes effort and provides greater flexibility regarding personnel decisions – thus the merits of the scheme. We characterize the equilibrium club size, and show that although the effort-discretion tradeoff is not completely mitigated in equilibrium, the total efforts in a promotion club scheme outperform that in a tournament scheme when the pool of agents is large. That is, promotion clubs accommodate both superior levels of efforts, and reasonable levels of personnel discretion. The superiority of promotion clubs also extends to a heterogeneous agent scenario, where the total efforts from cronies and non-cronies exceeds that in a tournament scheme, due to intra-crony completion.

Given the merits of the scheme, we proceed to validate the existence of club-based promotion pattern in real-life organizations. We collect the promotion records of 9,451 county leaders from 2,965 counties in China, from 2001 to 2016. We investigate a leader’s relative rank of economic performance – measured by local fiscal revenue growth – in the corresponding prefecture, and find that reaching the top five in the rank significantly increases a leader’s promotion likelihood by 4.1%. More importantly,

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<sup>3</sup> The intuition is consistent with the empirical findings that when county-level officials in China compete for fiscal revenues, the revenue features an inverted- $U$  shape with the numbers of competitors (i.e., the number of counties governed by the same prefecture), where on the one hand increased competition intensifies the working efforts; on the other hand, too many competitors discourage working (Landry and Lu, 2014).

increasing the rank from within or outside the top-five-club cannot significantly influence the leader's likelihood of promotion. That is, an official only receives a promotion probability surge when s/he is among the top five performers locally. However, it does not matter if s/he ranks the first, or third, or fifth, in the promotion race, which reveals the impact of discretions. Neither does it matter if the official ranks below top five. These findings demonstrate the existence of a club-based promotion pattern in hierarchical governments, which remains robust after a series of checks.

Having validated the existence of the club, we proceed to explore its variations. We first point to the hierarchical variations of the club scheme, which speaks to the varied importance of performance and political connections along the chain of command. Our theory predicts larger (smaller) club sizes at higher (lower) administrative levels, because higher administrative levels usually presents more survival risks, thus the increased needs for personnel flexibility. To test the variation, we expand the dataset to include prefecture- and province-level leaders in China. We find that promotion clubs consist of seven members at the prefecture level, compared to that of five members at the county level. Furthermore, a provincial-level club has eight members, and the result is only marginally significant. Both the sizes and the statistical significance suggest stronger presence of discretionary power higher up the hierarchy.

Meanwhile, we investigate the regional variations of the promotion clubs, to reveal the discretion due to ruling objective differences. Our theory predicts that regions with greater economic importance tend to have smaller clubs, while regions with higher data volatility - which makes performance harder to measure - tend to have larger clubs. Both are confirmed using county-level data. The model also predicts that regions have enlarged club sizes during non-economic campaigns, because personnel flexibility is essential when the ruling objective goes beyond a unilateral dimension of economic development. Indeed, we find that the clubs are larger in regions where higher-level governments launch environmental or social stability campaigns. Such variations are associated with different evaluation targets, and thus reflect the multi-task nature of

evaluation.<sup>4</sup> Especially, some targets are of poor measurability or data quality and accordingly discretion arises as a potential solution.

The paper contributes to three important strands of literature. First, the paper contributes to theoretical and empirical investigations on the use of tournaments in organizations, or more broadly, personnel economics. Led by Lazear and Rosen (1981) and Rosen (1986), this literature acknowledges the theoretical importance of the tournament approach as a high-powered incentive scheme. We extend the classical setup in Lazear and Rosen (1981) to accommodate both working incentives and personnel flexibility, whereas tournament becomes a special case. We show that a club-based promotion pattern may outperform tournament in efforts, while providing higher personnel flexibilities at the same time.<sup>5</sup> The paper echoes the discussion of adopting different incentive schemes in different environments (Shleifer 1985; Maskin, Qian, and Xu 2000; Alesina and Tabellini 2007), and validate the adopted of the promotion club as a novel incentive scheme in real-life organizations. Furthermore, the regional variation of data measurability is consistent with the multi-task literature (Holmstrom and Milgrom 1991), whereas the personnel flexibility serves as a partial remedy to the distorted incentives in such environment.

Second, the paper speaks to the classical competence–loyalty tradeoff (Glazer 2002; Burkart, Panunzi, and Shleifer 2003; Egorov and Sonin 2011; Zakharov 2016), and the abundant empirical evidence that supports the importance of connections in political survival (Cai and Treisman 2006, Opper and Brehm 2007, Reuter and Robertson 2012; Shih, Adolph, and Liu 2012; Xu 2018; Bai and Zhou 2019; Xi 2019; Buckley and Reuter 2019). While many prior studies rightly point out the distortion of this tradeoff, this paper highlights a potential alleviation of it: to design a promotion club. The paper from this literature that is closest to ours is Jia, Kudumatsu, and Seim (2015), which examines Chinese provincial officials and suggests that connections and

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<sup>4</sup> For example, in political system, in addition to economic performance, environmental quality and social stability are also sensible targets (Wu *et al.*, 2014; Yuen, 2014; Zheng *et al.*, 2014). In corporations, besides profits, social responsibility is becoming an increasingly important pursuit for firms (Garriga and Mele, 2004). Meanwhile, all these additional factors are relatively difficult to measure.

<sup>5</sup> Though there are many other interesting aspects of principal-agent relationships, we do not intend to provide the most comprehensive model. Instead, we restrict our attention to reconciling discretion and working incentives in rank-ordered performance, following the Lazear and Rosen (1981) setup.

performance complement each other because recruiting junior top performers fosters loyalty to the senior official. While we agree with Jia, Kudumatsu, and Seim (2015) on the critical importance of recruiting loyal top performers, our focus is on incentives, i.e., how to ensure the top performers are loyal, and how to ensure that loyalists will perform. Our sample is also broader, investigating political turnovers at the county, prefectural and provincial levels along the bureaucratic hierarchy.

Third, we add to the large volume of literature on promotions in China, by providing a comprehensive framework to understand the role of performance and political connection. Among a significant portion of the empirical evidence of promotion determinants in China, there is mixed evidence regarding whether tournaments are indeed adopted in practice. Our empirical investigations aim to reconcile the mixed evidence by providing a unified framework of the promotion clubs, that explains why performance can be significant for promotion in some cases (Bo 1996; Maskin, Qian, and Xu 2000; Li and Zhou 2005; Chen, Li, and Zhou 2005) but not in others (Shih, Adolph, and Liu 2012; Yao and Zhang 2015; Wu *et al.* 2014). In particular, our hierarchical variation reconciles the mixed evidence that a positive impact of performance on promotion decisions at more local levels, but a weaker to null effect at more senior levels. (See e.g. Opper, Nee, and Brehm 2015; Landry, Lü, and Duan 2018; Lu, Ma, and Zhu 2018; Chen and Kung 2018). Nevertheless, we shall point out that our framework applies to all organizations with top-down personnel control, which goes beyond China or any particular authoritarian regimes.

The rest of the paper is organized as follows. We introduce a model of the promotion club in Section 2, and study its features in Section 3. We then apply the model to data from hierarchical governments, and test model predictions in Section 4. We briefly introduce the extension of heterogeneous agents in Section 5. We conclude in Section 6.

## 2. Model

Consider one principal (she), and  $n$  agents (he, them). The principal selects  $m$

*top-performing* agents into a club, and then promotes one of them from within the club based on effort-independent, personal preferences. Promotion carries a reward,  $W$ , which can be a monetary reward, social prestige, or office-holding rents.

Agents exert costly effort  $a_i$ , at convex cost,  $c(a_i)$ . Following the classical setup in Lazear and Rosen (1981), performance  $X_i$  is a noisy realization of effort, where  $X_i = a_i + \epsilon_i, \epsilon_i \sim N(0, \sigma^2), i. i. d.$ <sup>6</sup>

The principal has private “mindset”,  $\eta_0$ , which is completely unknown to agents. Examples of mindsets include ideology, religious beliefs, cultural traditions, and moral codes. Likewise, agents have private mindsets  $\eta_i$ , which are only revealed to the principal after they are selected to the club. Mindsets are independent from the effort choices of agents. The principal intends to select the *most like-minded* agent from the club for promotion, because it is easier to collaborate with similar mindsets.<sup>7</sup> We assume that agents are *ex ante* homogenous – i.e., they do not know if they are preferred when they exert efforts. Therefore, they assume an equal probability of being promoted from the club, when they exert the efforts.<sup>8</sup> An example of this assumption is where  $\eta_0, \eta_i$  follow an improper uniform distribution, and the principal minimizes the squared distance with the agents within the club,  $E\left(\min_{i \in M}(\eta - \eta_0)^2\right)$ . In reality, it is sometimes possible that mindsets are publicly known, which we accommodate in the extended model introduced in Section 5.

The game proceeds in two stages. In the first stage, the principal announces and commits to a club size  $m$ , when all mindset information is private. Next, agents simultaneously exert effort, the top  $m$ -performing agents get into the club. In the second stage, mindset information becomes public within the club, and the principal selects the most like-minded agent to be promoted.<sup>9</sup>

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<sup>6</sup> Effort sometimes translates into competence. This is especially consistent with the experience of civil servants: no specific expertise is required. The more you get to know your constituency, the more local information you collect and the better governor you become.

<sup>7</sup> The preference towards like-minded agents can be interpreted as the preparation for future crony recruitment, or simply to reduce coordination costs. We deliberately abstract from the composition details of mindsets, to allow for a broad interpretation. Opper *et al.* (2015) explicitly construct a homophily index for provincial leaders in China, based on similar ideas.

<sup>8</sup> We assume in the model that efforts and mindsets are independent. In reality, they might be correlated based on the context (e.g. a religion-related effort may reveal the mindset of the principal, and induce more efforts from religious agents intrinsically). But there is no systematic correlation between the two, which justifies our assumption.

<sup>9</sup> Alternatively, a club-based promotion scheme can be that the principal selects  $m$  agents based on signals of mindset

For given agent population  $n$ , and promotion prize  $W$ , the principal's problem is as follows. She values both efforts,  $X_i$ , and gains from personnel discretion,  $S(m)$ , and selects an optimal club size subject to the agents' incentive constraints:

$$(1) \quad \max_m \alpha \mathbb{E}(\sum_{i \in N} X_i) + \beta S(m) - W$$

s.t.

$$(2) \quad a_i^* \in \operatorname{argmax}_{a_i} p_i(\text{club}) \frac{W}{m} - c(a_i)$$

Where  $p_i(\text{club}) = p_i(i \text{ beats } (n - m) \text{ others in } X_i)$ .

The gains from personnel discretion increase naturally with club size, because larger clubs offer more candidates to choose from. We assume  $S$  is increasing and concave in  $m$ , e.g.,  $S(m) = \mathbb{E} \left( \min_{i \in M} (\eta - \eta_0)^2 \right)$ . We also assume a fixed  $W$  to reflect wage rigidity, especially in public offices.

Each agent selects an effort level under the given club size  $m$ :

$$(3) \quad \max_{a_i} p_i(\text{club}) \frac{W}{m} - c(a_i)$$

As the club size grows, the key trade-off facing the agents is between the easier efforts to get into the club and the fact that shirking may achieve the same outcome. In the meantime, the principal considers how to incentivize high levels of total effort, while maintaining sufficient flexibility over personnel decisions, for survival concerns.<sup>10</sup>

### 3. Analysis

We start from the agent's effort choice under a fixed club size, and then proceed to the principal's choice of such size. When the size of the club increases, each agent's incentives to exert efforts have two counter-balancing forces: On the one hand, it is

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similarities, and then conduct a contest within the club. While this practice bears theoretical interests, it hardly applies to the environment we consider here, since the principal cares about the working incentives of the whole population. For example, if the agents are the mayors of  $n$  cities within a province, it is almost impossible for a provincial leader to first select  $m$  like-minded candidates, and forgo the performance of other cities. It is, however, a feasible strategy when agents do not have compulsory tasks, which makes the  $(n-m)$  excluded agents dispensable. Such examples are seen in power transitions in imperialism, where several princes are shortlisted for selection before one of them is declared heir to the throne.

<sup>10</sup> Notice the equal promotion probability when selected to the club is not equivalent to simply have a tournament, which promotes the best performer, because the efforts to outperform all other agents can far exceed the efforts to rank at, for instance, the first quartile.

easier to get into the club, which incentivizes working. We call it the *incentive role* of promotion clubs. On the other hand, once in the club, the agent faces a lower probability of being selected for promotion, which discourages working. We call it the *selection role*. Weighing the two roles, we have the following proposition.

PROPOSITION 1. Effort features an inverted- $U$  shape with respect to the size of the club,  $m$ , for  $n \geq 5$ . Effort decreases with size for  $n \leq 4$ .

PROOF. See Appendix.

Proposition 1 states that, when the agent population is large, the promotion club can outperform tournament in terms of generating working incentives. As the size of promotion club grows, the incentive role dominates because a positive promotion probability increase is worth the efforts. As the size becomes larger and larger, the selection role dominates, and agents are reluctant to work harder for smaller promotion probabilities. However, for small agent population (when  $n \leq 4$ ), the selection role always dominates, thus tournament is optimal. Proposition 1 shows that club-based promotion can be a good idea even if the principal only aims to maximize efforts. More importantly, denoting the effort-maximizing size as  $m_{club}$ , Proposition 1 suggests that before the club expands to  $m_{club}$ , the principal can effectively incentivize efforts and increase personnel discretion at the same time. Consequently, there is no loyalty-competence tradeoff when the club size grows from tournament ( $m = 1$ ), to the effort-maximizing club size,  $m_{club}$ . And the principal can kill two birds with one stone.

However, the principal does not stop at  $m_{club}$ . Under a given  $W$ , she solves the following problem:

$$(4) \quad \begin{aligned} & \max_m \alpha [\sum_{i \in N} X_i(a^*)] + \beta S(m) \\ & \Rightarrow \max_m \alpha n a^*(m) + \beta S(m) \end{aligned}$$

Intuitively, equilibrium is reached when the marginal benefit of personnel flexibility equals the marginal cost of incentive distortion. Denote the equilibrium club size as  $m^*$ , and compare the equilibrium club size and the effort-maximizing club size,

we have the following proposition:

**PROPOSITION 2.** In equilibrium, then  $m^*$  is characterized by  $\alpha n[a^*(m)]' = -\beta S'(m)$ . Moreover,  $m^* \geq m_{club}$ , which leads to (weakly) sub-optimal efforts.

**PROOF.** See Appendix.

Proposition 2 shows that although the promotion club scheme alleviates the effort–discretion tradeoff, it does not mitigate the problem in terms of working efficiency. The principal always tends to oversize the club, which results in effort distortion. Combining the two results, we describe both the merits and constraints in adopting a promotion club: it may generate high incentives to work and high degrees of personnel flexibilities at the same time, but may suffer from effort distortion by an oversized club.

### 3.1 Testable Predictions

To map the theory into real-life organizations, consider a hierarchical government with centralized personnel control, that is, local officials (subordinates) are appointed and promoted by superior officers. Furthermore, local officials exert efforts to develop the local economy, while the superior officials care both about economic performances, and whether the subordinates share similar mindsets, for instance, whether the subordinates are willing to join the faction when future political survival is at stake, or whether the subordinates acknowledge the importance of environmental protection alongside economic development.

In this context, Proposition 2 helps to establish useful comparative statics for empirical investigations. First, for the composition of principal’s objective,  $\alpha$  measures the importance of local economic performance to the principal, while  $\beta$  denotes the importance of personnel flexibility, and  $\sigma$  proxies the measurability of the performance evaluation. We thus have the following corollary.

CORROLARY 1. The promotion club size  $m$  increases as  $\alpha$  decreases, as  $\beta$  increases, and as  $\sigma$  increases.

In reality, principals at higher administrative levels of a hierarchical organization usually have stronger survival concerns, this result leads to two predictions about hierarchical and regional variation of promotion clubs: 1. Clubs are smaller in regions that are economically more important; 2. Clubs are smaller at the county level than at the prefecture level, which is smaller than that at provincial level.

Moreover, for the evaluation of performances, when the task is straightforward to measure, e.g. GDP growth or fiscal revenue growth, the promotion scheme becomes more meritocratic. Therefore we further predict that club sizes are larger in areas where output is harder to measure. This echoes the rationale of efficiency distortion in a multi-task model (Holmstrom and Milgrom, 1991). In this spirit, when principals face multiple ruling objectives besides economic development, greater personnel flexibility is required to reward the good-performers. Such non-economic campaign movements often include environmental protection, poverty eradication, anti-corruption, etc. Consequently, a larger club size (based on economic performance rankings) *during* such campaigns is implemented.

Similar intuitions apply to corporate environments, where managers in each levels care both about the performances of their teams, as well as the survival in corporate fights. We focus on hierarchical governments because they usually merit better data for empirical investigations. In the next section, we examine one of such hierarchical governments, China. Since promotion clubs are novel theoretical organizational designs, we first confirm its existence, using promotion data from Chinese officials, and then proceed to test the variations predicted by the theory.

## 4. Evidence

In this section, we first introduce the institutional background of China, and why

it is a good case for empirical investigations. Next, we confirm the existence of promotion clubs in China. We then explore the features of promotion club schemes. In particular, we recognize the substantial existing work on promotion decisions in China, and explain the mixed evidence as the hierarchical and regional variation of the promotion club predicted by our theory.

## 4.1 Background

Personnel control in China has always been top down and highly centralized (Xu 2011). The central government appoints provincial leaders, who then appoint prefectural leaders, who in turn appoint county-level leaders. In the reform era (post-1978), systematic evaluations became institutionalized gradually. In 1979, it was proposed that employee evaluations (thus promotions and demotions) should be based on four indicators: 1. Virtue: moral standards and political stances; 2. Competence: education level and management capabilities; 3. Diligence: whether the officials work tirelessly to serve the people; and 4. Performance: whether the officials accomplish the governance tasks (see, *On the evaluation of cadres*, by the Publicity Department of the CPC Central Committee). Among the indicators, (economic) performance was easily measurable and thus became the most important criterion of cadre selection.<sup>11</sup> Since then, follow-up policies and documents have specified the need to select cadres according to their regional economic performance. Not surprisingly, this mechanism greatly incentivizes economic development efforts (Xu, 2011). In addition, the evaluation system was designed to accommodate the need for selecting preferred subordinate, a feature that is sometimes equally (if not more) important for superior officials. Of the four criteria described above, virtue and diligence are highly unobservable and depend heavily on superiors' idiosyncratic preferences. Nor are there explicit rules of implementation regarding these two criteria. Such flexible and

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<sup>11</sup> For instance, in the development index in Jiangsu province, economic development accounts for 40%, living standards for 30%, social development for 20%, and environmental protection for 10% (The First Bureau of Organization Department, 2006, pp.176-184).

objective measures facilitate the principals to appoint loyalists to desirable posts. The combination of these two measurement categories constitutes an institutional foundation to help superior officers balance subordinates' efforts and personnel discretions.

Meanwhile, personnel discretion exhibits vertical heterogeneity, as illustrated by the official documents. A 1994 Central Committee report states that “the understanding of politics for high-level cadres, especially those above provincial level offices, matters for the fate of the Party and the nation.” However, for grass-roots officials, the evaluation focuses more on “the achievements to develop the local economy, society and party organizations” (General Office of the CPC Central Committee, 2009). The vertical shift of the importance of personnel discretions also reflects the diminishing returns of economic performance on promotion (Landry *et al*, 2018).

Besides economic performance, other dimensions of performance would also contribute to the governance outcome, which vary across regions. For instance, counter-terrorism and sustaining social stability receive high-level priority in border provinces such as Xinjiang and Tibet,<sup>12</sup> and Hebei's provincial secretary claims that they would try their own best to protect Beijing's air quality.<sup>13</sup> On the other hand, data manipulation may distort the performance measures, as seen in Liaoning, Inner Mongolia and Tianjin.<sup>14</sup> The measurability concern further calls for the room for discretion.

Understanding the balance between performance and discretion further helps us to interpret the mixed empirical evidence on whether efforts, or performance-based tournaments, increase promotion probabilities. To summarize, the top-down organizational structure of China allows superior officials to select and appoint subordinates. While making promotion decisions, the superior officials accommodate their needs of effort incentivization and personnel discretion, which varies both along the bureaucratic hierarchy, and across regions of different ruling objectives.

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<sup>12</sup> [http://news.ifeng.com/mainland/detail\\_2013\\_07/02/27007922\\_0.shtml](http://news.ifeng.com/mainland/detail_2013_07/02/27007922_0.shtml).

<sup>13</sup> <https://finance.ifeng.com/c/7n2sWqheI2X>.

<sup>14</sup> [http://www.xinhuanet.com/fortune/2018-01/20/c\\_1122289080.html](http://www.xinhuanet.com/fortune/2018-01/20/c_1122289080.html).

Consequently, the data from China not only enables us to validate the existence of promotion clubs, but also facilitates the investigation of their adoption dynamics.

## 4.2 Data and Variables

China's institutional background renders it a good candidate for our empirical investigation. Specifically, we focus on the political selection of county-level party secretaries, in which local economic performance plays a significant role. The empirical application is based on a dataset of 9,451 county-level party secretaries from 2,965 counties in China from 2001 to 2016.<sup>15</sup>

A core element of mapping the theory to China's county-level data is to define promotion. We employ the *de facto* power change induced by political turnover to define promotion, which is consistent with the mainstream approach in the literature (Li and Zhou 2005; Chen, Li, and Zhou 2006; Jia, Kudumatsu, and Seim 2015; Yao and Zhang 2015). That is, we define promotions as changes to powerful and more influential positions at higher levels in the bureaucratic hierarchy.<sup>16</sup> For instance, a county secretary is regarded as promoted if he receives a position at the provincial level or becomes a core member at the prefectural level. The latter includes deputy secretary, mayor, deputy mayor, standing committee member, secretary-general, as well as director of the Peoples' Congress or chairman of the People's Political Consultative Conference.<sup>17</sup> Using this definition, around 39% of party secretaries were promoted in our sample.<sup>18</sup> We briefly summarize the political turnover and promotion of party secretaries in our sample in Figure 1.

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<sup>15</sup> Our dataset covers China's county-level administration divisions including counties, districts, county-level cities, autonomous counties, banners and autonomous banners. For notation conciseness, we refer to all of them as "counties."

<sup>16</sup> By tracking the power changes of the positions, we avoid calling the cases of higher ranks but lower influence in the hierarchy as promotions.

<sup>17</sup> More detailed definitions of promotion are presented in Table A3. We use the *de jure* definition of promotion provided in the *Civil Servant Law of the People's Republic of China* for our robustness checks; the results are reported in Figure A5.

<sup>18</sup> This percentage coincides with those at the prefectural and provincial levels: 26% for provincial leaders in Jia, Kudumatsu, and Seim (2015) and 39% for prefectural leaders in Yao and Zhang (2015). In addition, we summarize other secretaries' personal characteristics in Figure A2, which are regarded as important factors affecting officials' political turnover.

[ Insert Figure 1 Here]

Another core element is the measurement of the club. We argue that economic performance serves as the basis of club formation, and that local officials are required to achieve sufficient economic performance to be considered for promotion. It is widely acknowledged that relative performance evaluation may mitigate the moral hazard problem (Lazear and Rosen, 1981; Gibbons and Murphy, 1990; Kumbhakar and Hjalmarsson, 1998; Jenter and Kanaan, 2015), and is adopted in the context of China (Chen *et al.*, 2006, Xu 2011), therefore we investigate the performance ranks among competitors. Specifically, we measure performance rank by referring to the rank of fiscal revenue growth rate for a county within a prefecture, which has been proven a crucial indicator in China's political selection system (Ong 2012; Chen and Kung 2016; Landry, Lü, and Duan 2018).<sup>19</sup> Meanwhile, we calculate fiscal revenue growth as the moving average since the first year the official took office, to capture the tenure-based cadre evaluation in China.

For the empirical analysis, we also introduce the control variables, including party secretaries' personal characteristics such as age, education year, tenure year, and counties' socioeconomic characteristics such as population density, relative economic size (measured as the county's revenue as a share of the prefecture's revenue), and economic structures (measured by the ratio of agriculture output to GDP and the ratio of manufacturing output to GDP). The summary statistics of these variables are presented in Table 1.

[ Insert Table 1 Here]

### 4.3 Existence of Promotion Clubs

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<sup>19</sup> One concern arising from measuring performance with growth is that it may favor the initially under-developed areas, as they tend to enjoy relatively higher growth rate in subsequent periods. However, this concern would not threaten the validity of our analysis: First, data reveals that such pattern is quite weak in the sample period in China, as illustrated in the left part of Figure A1. Second, we compare and rank growth measure between counties within the same prefecture, and the right part of Figure A1 tells that within-prefecture convergence does not completely dominate all areas. In particular, if we focus on the subsample where within-prefecture correlation between initial revenue level and subsequent revenue growth is relatively weak (between -0.2 and 0.2), our results remain robust (Figure A6).

We validate the existence of promotion clubs in this section. We follow Jia, Kudumatsu, and Seim (2015), and use a linear probability model to examine the relationship between club size and promotion. The econometric specification is as follows:

$$(5) \quad P_{ct} = \alpha + \sum_{i=1}^{10} \beta_i R_i + \gamma X'_{ct} + \rho Z'_{ct} + \delta_c + \eta_t + \xi_{pt} + \varepsilon_{ct}$$

In the specification,  $c$  and  $t$  indicate county and year, respectively, and  $p$  indicates the prefecture the county is governed by. The dependent variable  $P_{ct}$  is a dummy variable that equals 1 if the county's party secretary was promoted at the end of his tenure, and 0 otherwise. The main independent variables are a series of ranks  $R_i$ 's, where  $R_i$  equals 1 if the moving average fiscal revenue growth of county  $c$  in year  $t$  is located in the top  $i$ -th rank within the prefecture, and 0 otherwise. For instance, an official who ranked third in the prefecture shall have  $R_j = 1$  for  $j \leq 3$ , and  $R_j = 0$  for  $j \geq 4$  in the data entry. We expect to find one positive and significant  $\beta_i$ , which can be interpreted as an indicator of the existence of a promotion club and  $i$  as the club size: we expect  $\beta_j$ s with  $j < i$  are insignificant, to reflect that once entering the club, officials refer to superiors' discretion for promotion and their performance no longer matters; Meanwhile, we expect  $\beta_j$ s with  $j > i$  are insignificant, to reflect that when they are outside the club, officials' performance efforts cannot lead to an increase in promotion likelihood.

In addition,  $X'_{ct}$  represents personal characteristics and  $Z'_{ct}$  represents socioeconomic characteristics, detailed in the previous section. We also control for county fixed effects  $\delta_c$  to capture all time-invariant county-level factors, and year fixed effects  $\eta_t$  to capture the economic shocks affecting all counties in a given year. We also consider prefecture-level time-invariant factors and allow their effects to evolve by year, which is captured by  $\xi_{pt}$ . The standard errors are clustered at the prefectural level to address the heteroskedasticity and serial correlation of the error term within each prefecture.

We report the baseline result in Figure 2, where the green dots indicate coefficients

and the blue dashed lines represent 95% confidence intervals.<sup>20</sup> We find positive and significant results only for  $i = 5$ , which suggests that officials enjoy a significantly higher promotion probability only if they rank at top five among their colleagues. Furthermore, the specific rank among the top five does not matter. That is, the promotion club for county-level officials exists, and the club size is five. In terms of magnitude, joining the club significantly increases an individual’s promotion likelihood by 4.1%,<sup>21</sup> which accounts for 9.76% of the mean value of promotion likelihood in our sample ( $=0.420$ ).<sup>22</sup> In other words, with a strong promotion incentive, China’s county-level party secretaries compete to pursue high fiscal revenue growth to become the top in the cohort. However, among the top cohort, increasing the rank cannot significantly influence one’s likelihood of promotion, which paves the way for discretionary power in political selection.<sup>23</sup>

[ Insert Figure 2 Here]

To justify the robustness of our baseline finding, we conducted three more exercises. First, we address the missing information concern and show that it does not threaten the validity of our results.<sup>24</sup> Specifically, we calculate the number of counties within each prefecture as if there were no missing values as well as the counterpart in our sample where missing values exist. We use the ratio of these two numbers as an

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<sup>20</sup> The baseline result, along with the results from Figures 3 and 4, are also reported in Table A5.

<sup>21</sup> The corresponding p value is 0.019, and the adjusted p value through multiple-test procedure is 0.084.

<sup>22</sup> The standard error in Figure 2 is increasing as the rank increases, which rises the concern that a smaller club size at county level may be the consequence of such trend. However, we do not think it would affect the identification of club sizes. The variance of  $\hat{\beta}_i$  is calculated as  $\sigma^2 / (SST_j \times (1 - R_j^2))$ , where  $\sigma$  is the standard error of residuals,  $SST_j$  is the sample variance of  $R_j$ , and  $R_j^2$  is the R-squared from regressing  $R_j$  on all other independent variables. Here we have clear expectation about the evolution of  $SST_j$  along  $j$  (but not for  $R_j$ ): as our independent variables are dummies and the fraction of value 1 increases with  $j$ , their variances would first increase until the mean reaches around 0.25 and then decrease. Thus under the case where there is no apparent systematic pattern for  $R_j$ , we can naturally expect  $var(\hat{\beta}_i)$  would temporarily decrease and then increases with  $j$ .

<sup>23</sup> The practice of political selection in China provides some hints on the existence of promotion club identified by our empirical analysis. For example, according to the political selection procedure in Table A1 which is summarized from “Regulation on the Selection and Appointment of the Party and Government Leaders” (2014), the third and core step is to recommend or nominate some candidates (mainly according to their performance) for further investigation, and the number of candidate to be investigated should be more than those who are finally promoted. It shares almost the same spirit with our prototype of promotion club.

<sup>24</sup> Around 46% of observations in our sample suffer from such a problem that at least one of official-related variables (including  $P_{ct}$  and  $X_{ct}$ ) is missed. However, only 15% of observations are dropped due to missing economic variables. The disparity between these two missing ratios allow us to test whether the missing values are randomly distributed, or in other words, whether the missing values are clustered at a given rank: among the sample with no economic information missing, we generate a variable indicating whether there is missing in personal information for each observation, and then regress it on performance ranks. We find no significant correlations in Table A6, which suggests that the missing values are not clustered.

indicator and employ the subsample with a relatively mild missing extent (ratio < 0.5) to replicate the baseline exercise. The results, reported in Figure A3, reinforce our finding that joining the top five significantly increases one's promotion likelihood.

The second concern arises from favoritism: it is possible that a principal treats an agent with favorable policies for economic performance, and then adopts relative performance evaluations to “fairly” select the agent. To rule out this possibility, we control for two variables specific to an agent or a region: 1. the connection between principals and agents, proxied by a dummy indicating whether the county party secretary shares the same hometown with the prefecture party secretary, and 2. a variable specific to a regional favoritism policy, proxied by fiscal transfers. Figure A3 shows that the results remain robust.

The final concern is that the large number of independent variables may lead to spurious correlations arbitrarily, since some coefficients end up significant regardless of their economic meaning as the number of independent variables increase. To rule out this possibility, we preserve the regression format but falsify the contents of the variables. Specifically, we randomize the promotion status as well as performance ranks and then compare the resulting significances. We conducted the randomization 1,000 times, and report the results in Figure A4. In more than 95% of the cases the coefficients remain insignificant, which lends more confidence that the baseline result is not an outcome by chance.

#### **4.4 Hierarchical Variations of Promotion Clubs**

Having validated the model, we now proceed to its predictions. Along the hierarchy, the model suggests that clubs should be larger at the prefectural level than at the county level, and even larger at the provincial level, due to the increased importance of discretion higher up the hierarchy. To test the prediction, we collect the prefectural- and provincial-level promotion data in China for the same period as in the baseline,

through similar channels.<sup>25</sup> We report the results in Figures 3 and 4. Clubs are indeed larger higher up in the hierarchy:<sup>26</sup> promotion clubs consist of seven members at the prefecture level, compared to that of five members at the county level. Furthermore, a provincial-level club has eight members, and the promotion club effect is only mildly significant ( $p = 0.083$ ), which suggests the abundant flexibility at higher offices.

[ Insert Figure 3 Here]

[ Insert Figure 4 Here]

The hierarchical variations of promotion clubs reconcile several mixed evidence in the literature, concerning the role of performance versus political connection in promotion decisions. First, we echo the seminal provincial evidence from Li and Zhou (2005), and extend the provincial analysis to the prefectural and county levels, to show that economic performance matters for promotion, especially at local levels. However, the pursuit of economic performance does not exclude personnel discretion, which is guaranteed by a subtle, club-based implementation. Second, the hierarchical increase of promotion club size suggest a shift from meritocratic approach at local level promotions to a discretionary one up the hierarchy, which reconciles the considerable mixed finding in the literature: at the county level, a large volume of existing literature agree that enhanced economic performance leads to better promotion opportunities (Guo 2007; Chen and Kung 2016; Landry *et al.* 2018). At the prefectural level, while a significant trunk of literature speaks to the positive impact of performance (Wu *et al.* 2014, Luo *et al.* 2015), occasional challenges suggest that other determinants may be at play (Yao and Zhang 2015). However, at provincial level where political struggles are more severe, some confirms the role of performance in promotions (e.g. Bo 1996, Li and Zhou 2005, Whiting, 2001), some highlights the impacts of political connections that invalidate the role of performance (Opper and Brehm 2007; Tao 2010; Shih,

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<sup>25</sup> E.g., Baidu Encyclopedia (Baidu Baike, [www.baik.com](http://www.baik.com)), Zechen Web (<http://www.hotelaah.com/liren/index.html>), China Vitae (<http://www.chinavitae.com/>), CSMAR. We collect prefecture-level economic data from China City Statistical Yearbook (*Zhongguo Chengshi Tongji Nianjian*), which is compiled by Department of Urban Surveys of National Bureau of Statistics, and China Statistical Yearbook for Regional Economy (*Zhongguo Quyu Jingji Tongji Nianjian*), which is compiled by Department of Comprehensive Statistics of National Bureau of Statistics. We also collect province-level data from China Statistical Yearbook (*Zhongguo Tongji Nianjian*), which is compiled by National Bureau of Statistics.

<sup>26</sup> This finding is consistent with the general pattern in Yang and Zheng (2013), who find that the top ten prefecture party secretaries within their province in terms of GDP growth are more likely to be promoted than others.

Adolph, and Liu 2012; Opper *et al.* 2015), and some argue for a complementary relationship between the two (Choi 2012, Jia *et al.* 2015). The empirical debate is well-reflected in our result that the provincial level promotions provide high degrees of discretionary power, thus more evidence of discretion is witnessed; while lower level promotions focus more on economic performance, thus more evidence of meritocracy is found.

## 4.5 Regional Variations of Promotion Clubs

The regional diversity of China also facilitates an empirical investigation on the size dynamics of promotion clubs. To begin with, the theory suggests larger (smaller) club sizes in economically less (more) important regions, due to the differing importance of economic performance. We use provincial per capita GDP growth rates to proxy for economic significance, and evaluate the club sizes on counties located in provinces with lower vs. higher than median per capita GDP growth rates. As shown in Figure 5, we find that clubs in economically important regions have 5 members,<sup>27</sup> and have 11 members in other regions.<sup>28</sup> The result shows that the promotion scheme tends to be more meritocratic and performance-oriented in regions where economic development serves as the major ruling objective. Moreover, it exhibits the flexibility of promotion clubs to accommodate region-specific objectives. Such heterogeneity, or flexibility, is so general that it also makes sense outside political system and outside China. For example, it is found that there are considerable more discretion over school personnel in Brazil's low income areas (Akhtari *et al.*, 2017).

[ Insert Figure 5 Here]

Relatedly, the theory suggests the regional variation due to change of ruling objectives: when a region is undergoing campaigns of various natures, the principal

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<sup>27</sup> A slightly different from the baseline results, we also find that becoming the first rank in economically more important regions can also significant increase promotion likelihood, which may be the bonus prize of the champion.

<sup>28</sup> Figure 3 reports the results by using all ranks after (including) 11 as the reference, and thus no significant results are indicated in the economically less important regions, where the club size is 11. This positive and significant result can be revealed by reducing the size of the reference group and including more ranks in the comparison (e.g. using all ranks after (including) 16 as the reference).

tends to exercise more discretion over campaign-related issues, and thus enlarges the club size. Empirically, we restrict our attention to two kinds of campaigns: environmental protection and maintaining social stability. We utilize whether a prefecture receives a visit on environmental issues from provincial or central leaders in a given year to capture environmental campaigns, and whether a strike takes place in a prefecture in a given year to proxy for the existence of a stability maintaining campaign. Then we compare counties in prefectures with no environmental visits and strikes with those in prefectures that have at least one environmental visit or at least one strike.<sup>29</sup> The results are reported in Figure 6, which suggests that clubs are indeed larger when there are non-economic campaigns.

The finding is directly consistent with existing literature suggesting environmental quality also receives its weight in political evaluation and can partially predict promotion (Wu *et al.*, 2014; Zheng *et al.*, 2014). Furthermore, it echoes the finding that environmental campaigns would crowd out the role of economic performance, as suggested by Chen *et al.*(2018). Similarly, for social stability, existing research finds that in addition to those violent strikes, even the occurrence of peaceful electronic petitions can be related to more discretion and patronage (Jiang *et al.*, 2019; Jiang and Zheng, 2020). Both cases further suggest that discretion, or club size in our language, is generally applied when broadened ruling objectives occur.

[ Insert Figure 6 Here]

Furthermore, the theory emphasizes a large club size in regions where the outputs are harder to measure. We utilize both a direct and an indirect proxy for task measurability. For the direct proxy, we follow Chen, Qiao, and Zhu (2019) to calculate GDP manipulation in each county and year, which is based on Henderson, Storeygard and Weil's (2012) approach using satellite night-time illumination data to filter out potential manipulation of official GDP data. The ratio of manipulation of official GDP data is used to proxy for the difficulty of output measurement: higher ratio corresponds

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<sup>29</sup> Here we treat these two campaigns as the same category (non-economic campaign) and consider them simultaneously. A related benefit from such exercise arises from the alleviation of small sample bias, as if we consider each campaign separately, the subsample covering the campaign would be too small to be comparable with the counterpart without campaign (e.g. 6% vs. 94%).

to more difficulties in measuring agents' actual outputs. We take the average of the ratios within each prefecture and divide the prefectures into two groups according to the median value of the average ratios. The empirical results based on counties governed by these two groups of prefectures are reported in Figure 7, which shows that the club size for the low data manipulation group is higher than that for the high data manipulation group, which confirms our theoretical prediction.

[ Insert Figure 7 Here]

Additionally, we borrow the idea for the indirect proxy from Serrato, Wang, and Zhang (2019),<sup>30</sup> and use the coefficient of variation (COV, standard deviation divided by mean) of fiscal revenue growth within each prefecture to proxy for whether the output is easy to measure or not: the higher the COV, the more difficult it is for principals to accurately judge the actual performance of their agents, and the less meritocracy is employed in the process of political selection. We similarly divide the prefectures into two groups according to whether each within-prefecture (across-county) COV is greater than their median value. The regression exercise is conducted for counties in each prefecture group and the corresponding results are reported in Figure 8. The theoretical prediction is again verified, as the empirical evidence indicates that club size is positively related to the level of volatility, although the difference in sizes is smaller.

[ Insert Figure 8 Here]

Our finding indicates the decrease of statistical information quality would require more personnel flexibilities, which coincides with the theoretical argument in Holmstrom and Milgrom (1991), that poor measurability of tasks distorts working incentives. Larger personnel discretion consequently serves as a remedy. For instance, Wu *et al.* (2014) use city-level data in China to find that city spending is strongly tilted towards more observable investments in transportation infrastructure, but not in public welfare, and we contend an enlarged club can correct such bias appropriately.

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<sup>30</sup> Serrato, Wang, and Zhang (2019) use the standard deviation of migration of measure the noisiness of One Child Policy performance.

## 5. Extension: Publicly Known Cronies

In the baseline model, we assume agents' mindsets constitute private information when the principal determines the club size, which makes the agents ex ante homogenous. Yet in reality, agents are often heterogeneous in terms of some observable traits or connections to the principal, and thus differ in their potential to become cronies. The observable traits may be shared hometown, school alumni, colleagues, etc. To study the roles of heterogeneous agents, we extend the baseline model to allow for some agents that are publicly known to be connected to the principal. We also assume that the principal selects agents in a lexicographic manner: once in the club, connected agents (cronies) are always preferred to unconnected ones (non-cronies). For conciseness, we include the detailed model extension in the appendix, and introduce only the intuition in this section.

With heterogeneous agents, when cronies occupy a small share of the agent population, both crony and non-crony agents shirk. The non-cronies shirk because they are less preferred even if they make it to the club. And the cronies shirk because club size will be enlarged to ensure sufficient probability of crony inclusion, when survival concerns are significant.

On the other hand, when a majority of the agent population are cronies, which we refer to as a *crony-ful* environment, cronies compete with each other. In particular, when the club has more than two members, the non-crony stops working completely: even if he makes it into the club, he will be dominated by at least one other crony. However, cronies compete hard to compete for the promotion opportunity: in an environment of one non-crony and  $(n - 1)$  cronies, the principal's problem is essentially the same as in the homogenous case with  $(n - 1)$  agents. Given the merits of promotion clubs in generating higher efforts, it may produce higher total efforts, and thus better total public goods provision in a crony-ful environment. We provide further empirical evidence to support the claim using county-level data from China, where we show that as the shares of cronies increase, more fiscal revenue is procured. The analysis in a crony-ful

environment further illustrates the merits of the promotion clubs in incentivizing efforts. The details of the extended model and the empirical strategies are included in the Appendix.

## 6. Discussions and Conclusion

We propose and empirically validate a tournament-like incentive scheme called the promotion club. In this scheme, the principal selects, from  $n$  agents,  $m$  top-performing ones into a club, and then promotes one from within the club based entirely on the principal's effort-independent preferences ("mindset"). We show that a proper ( $m > 1$ ) promotion club often helps to incentivize agents' efforts while maintaining some discretionary power over personnel control, and employ political turnover data from China to validate the model and test its predictions.

We validate the model and test its predictions using data from China. We first demonstrate the existence of a club-based promotion pattern using county-level data from 2001 to 2016. The empirical analysis shows that reaching the top five in the performance measure (in other words, joining the club) can significantly increase the promotion likelihood. Further model predictions also receive empirical support: club size expands with administrative levels; club size shrinks in regions with higher economic importance, and expands in regions with higher data volatility; club are also likely to be enlarged during non-economic campaigns.

The model includes two primary simplifying assumptions to make the economic insights clear. First, we assume that the distribution of mindsets is an improper uniform distribution. One could relax this assumption to allow a random distribution function, in which agents with mindsets closer to the distribution mean should have higher working incentives. Second, we assume that the principal can commit to a certain club size. Though the superior officer in a bureaucracy has no commitment power in reality, the dynamic nature of principal-agent interactions helps to, at least partially, solve the problem. For instance, if the principal announced a club size and then selected someone

from outside the club for promotion, the agents would no longer believe in the promotion club scheme and would have a strong incentive to shirk, which is undesirable for the principal in the long run. Moreover, we abstract from the real-life practice of announcing the club size to focus on the incentive concerns, by simply allowing the principal to suggest a number. In reality, vague conversations of future visions are often provided, which strengthens the possibility of discretion on the part of the principal. However, subordinates may infer the degree of selection from such noisy signals. One may add a noisy announcing stage of club size, but the main insight of the model remains. We also abstract from the details on how the principal manages to discover the agents' mindsets, as we abstract from the explicit form of personnel discretion gains, to highlight both the tradeoff and its alleviation using promotion clubs.

Our last remark reiterates the broad scope of application for this paper, since top-down personnel control is also pervasive in other political regimes, and in other organizations including corporations (e.g., Benson *et al.*, 2019), military (e.g., Xu, 2019), and sports teams (e.g., Noll, 2002). Therefore we expect to see evidence of club-based promotions in other organizations as well.

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## Figures and Tables

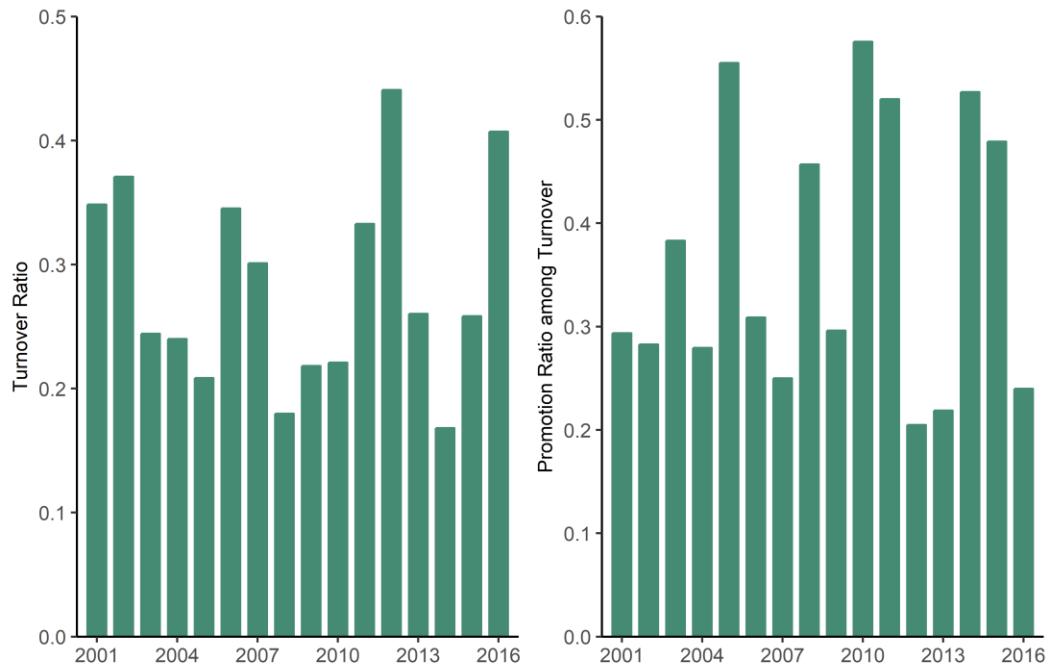


Figure 1. Political Turnover and Promotion

Notes: The vertical axis in the left panel indicates the turnover ratio of county-level party secretaries, which is calculated as the ratio of number of counties experiencing political turnover to total number of counties in our sample in each year; and the vertical axis in the right panel indicates the ratio of promoted county-level party secretaries among all turnover cases, which is calculated as the ratio of the number of counties whose party secretary obtained promotion to the number of counties experiencing political turnover in each year.

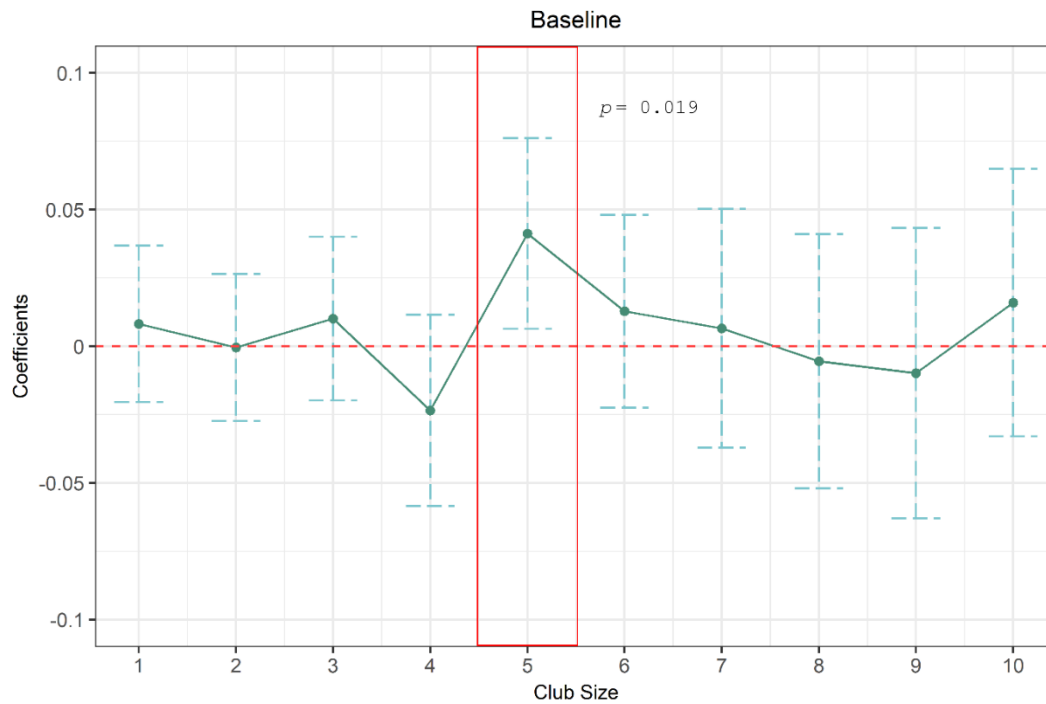


Figure 2. The Promotion Club

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, logged agricultural output and logged manufacture output), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. The ranks after (including) 11 are used as reference groups. See table A4 for the exact numbers of these point estimates.

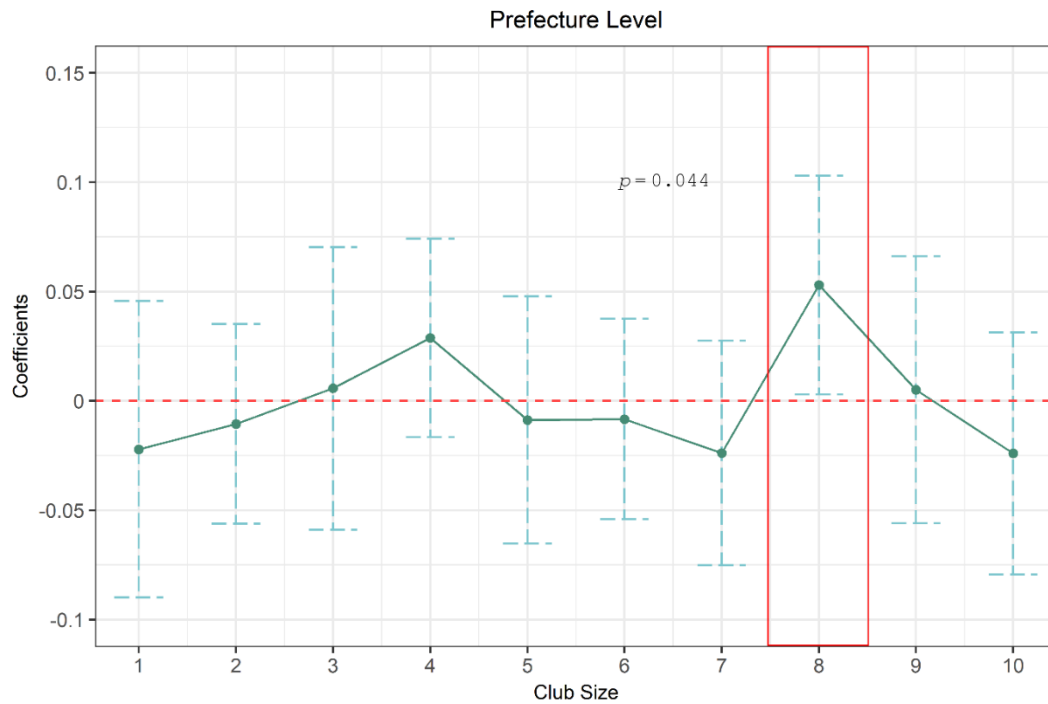


Figure 3. Promotion Club at the Prefectural Level

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. The ranks after (including) 11 are used as reference groups. See table A4 for the exact numbers of these point estimates.

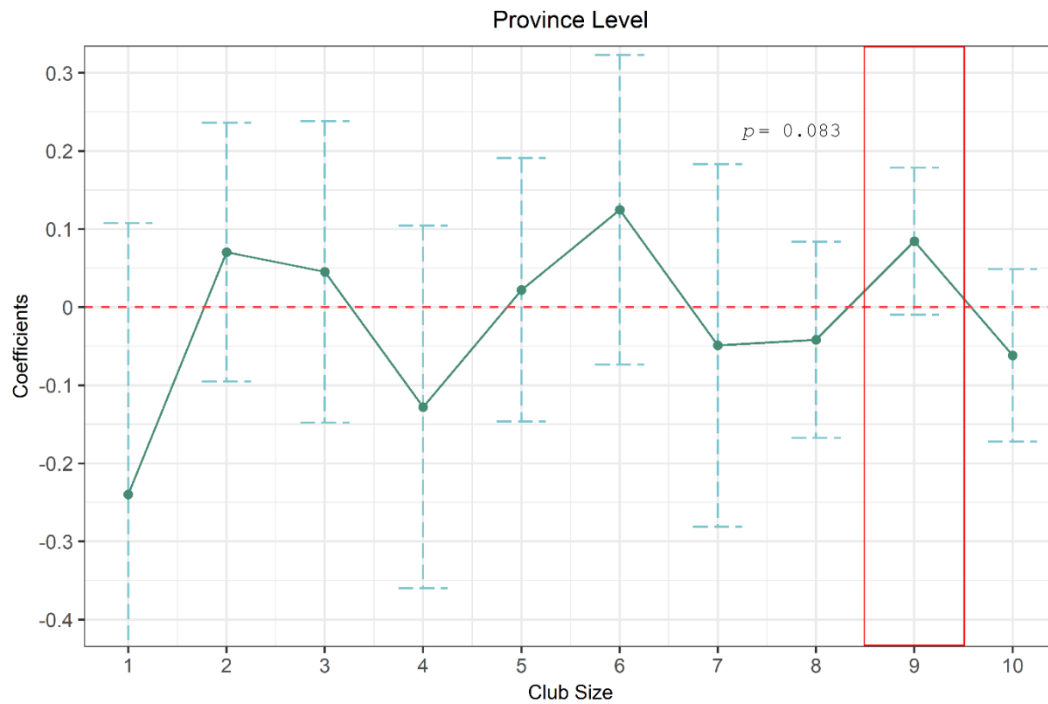


Figure 4. Promotion Club at the Provincial Level

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. The ranks after (including) 11 are used as reference groups. See table A4 for the exact numbers of these point estimates.

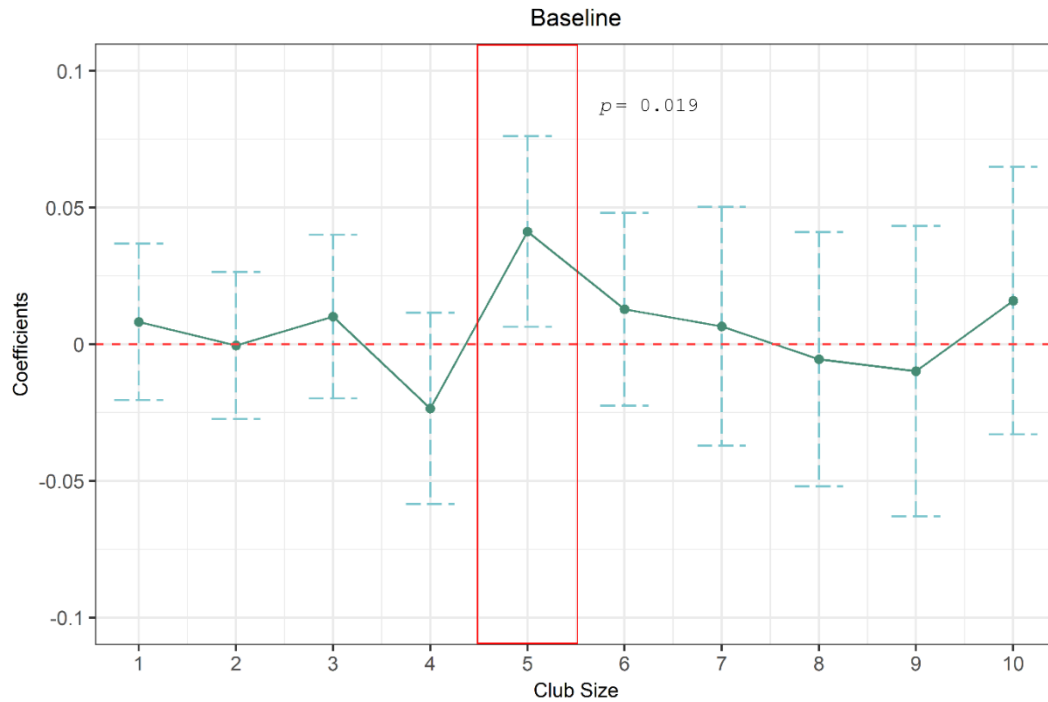


Figure 5. Club Size in terms of Economic Significance

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. The economically more important regions include counties in provinces with per capita GDP growth rates no lower than the median level, and the economically less important regions contain counties in provinces with below-median per capita GDP growth rates. The ranks after (including) 11 are used as reference groups.

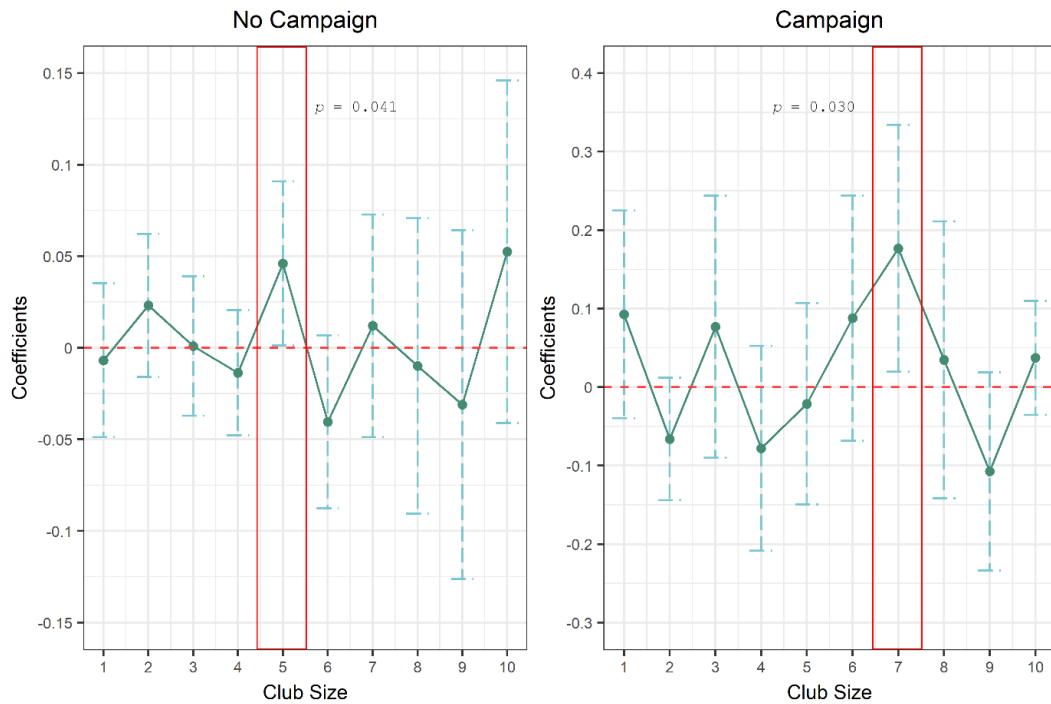


Figure 6. Club Size in terms of Campaign

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. An environmental campaign is measured by a visit from provincial or central leaders on environmental issues. "No Non-economic Campaign" indicates that no provincial or central leaders visited the prefecture that year on environmental issues and no strikes took place in a prefecture in that given year; "Non-economic Campaign" indicates there was at least one such environmental visit or there was at least one strike. The visiting data (2007-2010) is borrowed from Wang, Cao and Chen (forthcoming), and the strike data (2007-2010) comes from the China Labor Bulletin (<https://clb.org.hk/>). The ranks after (including) 11 are used as reference groups.

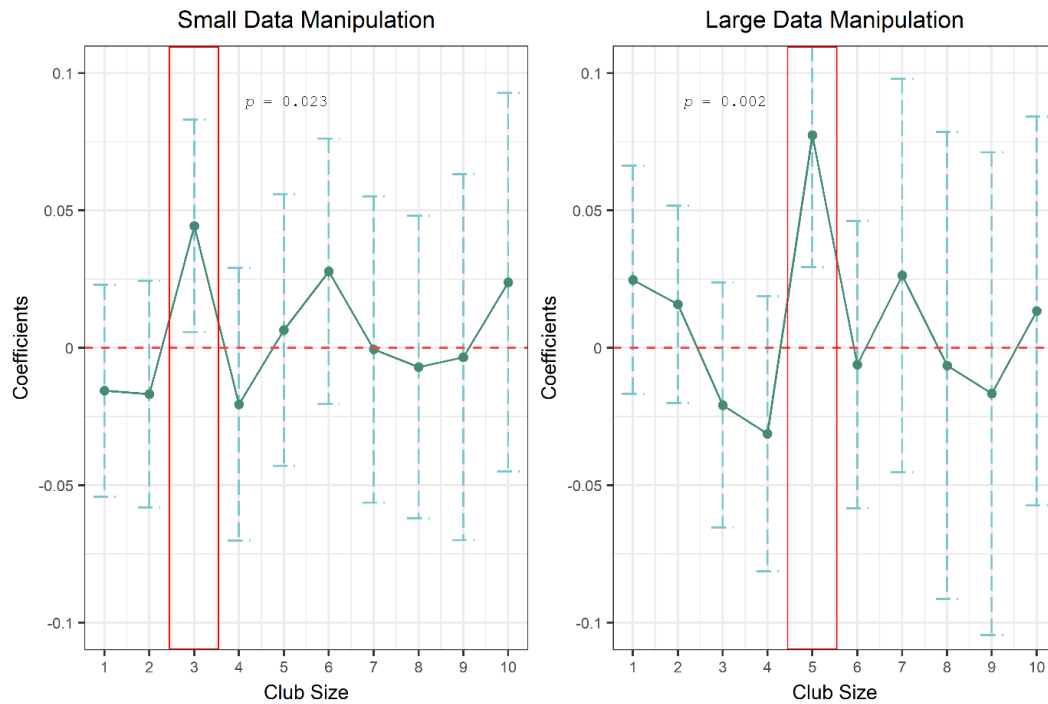


Figure 7. Club Size in terms of Data Manipulation

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. Data manipulation is measured by the gap between official GDP and estimated "true" GDP; the latter is estimated following Henderson, Storeygard and Weil's (2012) approach, which utilizes satellite night-time illumination data to filter out manipulated official GDP data. The high data manipulation regions include counties in prefectures where the average gaps are no lower than the median value, and the low data manipulation regions contain counties in prefectures where the average gaps are lower than the median value. The ranks after (including) 11 are used as reference groups.

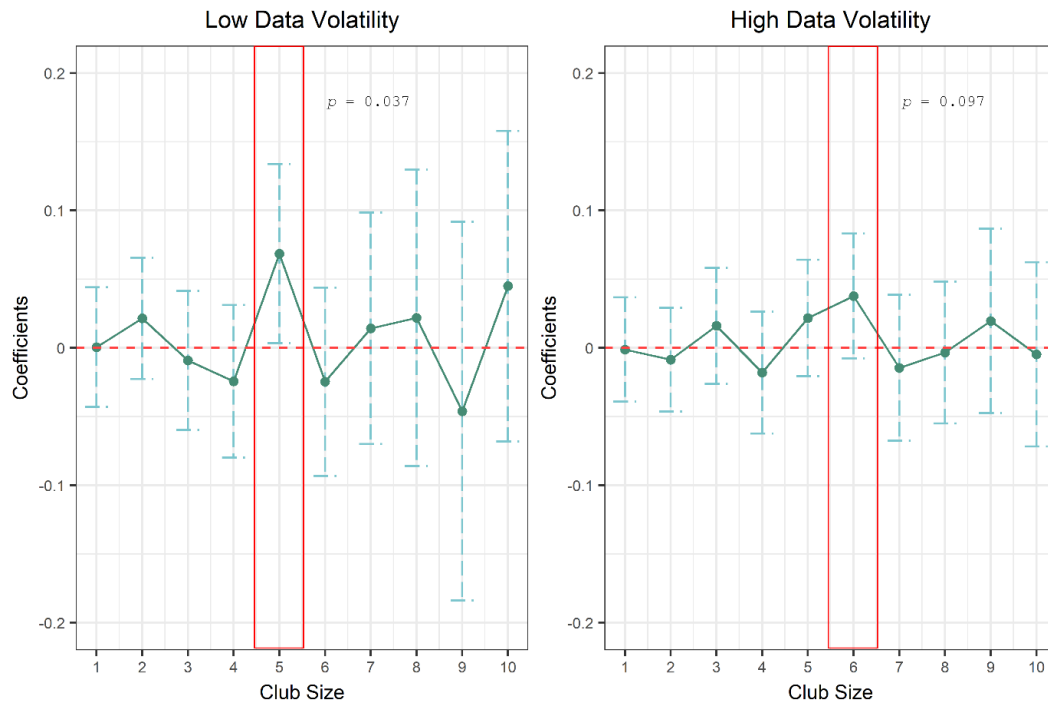


Figure 8. Club Size in terms of Data Volatility

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. Data volatility is measured by the coefficient of variation (COV, standard deviation divided by mean) of fiscal revenue growth among counties within each prefecture. The high data volatility regions include counties in prefectures where COV is no smaller than the median value, and the low data volatility regions contain counties in prefectures where COV is smaller than the median value. The ranks after (including) 11 are used as reference groups.

Table 1 Summary Statistics

Variables	Observations	Mean	Standard Deviation	Data Source
Promotion dummy	24,017	0.420	0.494	A
Moving average fiscal revenue growth rate	30,284	0.156	0.164	B
Age	25,762	47.079	4.096	A
Years of education	22,546	16.850	2.572	A
Tenure	32,846	2.558	1.623	A
Population density	35,077	0.073	2.348	B
Fiscal revenue share within prefecture	34,840	0.152	0.133	B
Agricultural output (log)	35,044	10.393	1.194	B
Manufacture output (log)	34,944	11.009	1.661	B
Dummy for provincial per capita GDP growth rate	32,783	0.524	0.499	C
Dummy for within-prefecture fiscal revenue growth rate volatility	32,337	0.559	0.496	B
Dummy for gap between official and estimated "true" GDP	34,146	0.497	0.500	D
Environmental visiting	11,239	0.117	0.458	E
Strike	14,150	0.102	0.391	F
Connection dummy	21,436	0.041	0.197	A
Crony share within prefecture	30,339	0.037	0.133	A

Source: A: collected by authors; B: China County Statistical Yearbook (*Zhongguo Xin(shi) Shehui Jingji Tongji Nianjian*), compiled by Department of Rural Surveys of National Bureau of Statistics; China Statistical Yearbook for Regional Economy (*Zhongguo Quyu Jingji Tongji Nianjian*), compiled by Department of Comprehensive Statistics of National Bureau of Statistics; C: China Statistical Yearbook (*Zhongguo Tongji Nianjian*), compiled by National Bureau of Statistics; D: Chen, Qiao and Zhu (2019); E: Wang, Cao and Chen, forthcoming; F: China Labor Bulletin (<https://clb.org.hk/>).

## Appendix 1: Extended Model

### A1.1 Extension

In the baseline model, we showed that with homogeneous agents, promotion clubs outperform tournament when the agent population is large, but the principal tends to oversize the club. Yet in reality, agents are often heterogeneous in terms of some observable traits or connections to the principal, and thus differ in their potential to become cronies. The observable traits may be shared hometown, school alumni, colleagues, etc. In this section we maintain most parts of the baseline model unchanged, and further assume that some of the agents are publicly known to be connected to the principal. We also assume that the principal selects agents in a lexicographic manner: once in the club, connected agents (cronies) are always preferred to unconnected ones (non-cronies). We assume that connected agents are all equally likely to be selected for promotion, to echo our previous setup.

For simplicity, we consider two extreme scenarios to illustrate the insights. In the first, there is only one publicly known crony among  $n$  agents. The insight speaks to cases in which cronies occupy a minority of the agent population. In the second scenario, there is only one non-crony among  $n$  agents. This speaks to the cases in which a majority of the agent population are cronies, which we call a crony-ful environment.

When the size of the club is fixed, which may be due to the costs of confusion if the rules alternate too frequently, replacing a non-crony with a crony necessarily increases the incentives of the new crony to work hard (compared to their non-crony colleagues) in a *proper-sized* club ( $m > 1$ ), because cronies always enjoy privileges in intra-club selections. Meanwhile, non-cronies' incentive to work has sharply declined if the principal selects a *proper* promotion club ( $m > 1$ ), because the crony will always be preferred for promotion.

Over a longer time horizon, when the size of the club is endogenous, a large club can be selected to ensure cronies are included if survival concerns are significant. In

the meantime, the crony may shirk compared to a non-crony in an  $n$ -agent tournament, since he understands non-cronies' reluctance to work, and the principal's willingness to enlarge the club. As a result, creating a proper promotion club distorts the efforts of all agents when there are few cronies.

PROPOSITION A1. When there is only one crony among the agents, the principal selects the optimal club size,  $m^* > 1$ , if at least one of the following holds:

1.  $\beta > \bar{\beta}$
2.  $n > \bar{n}$

PROOF. See Appendix of Proofs.

COROLLARY A1. When there is only one crony, the crony shirks, and the non-cronies shirk more, compared to their effort in an  $n$ -agent tournament.

PROOF. See Appendix of Proofs.

As the proposition shows, when there are few cronies, they can almost force the principal to enlarge the club for inclusion. In a hierarchical bureaucracy, if a connected official lands among unconnected colleagues, there are two counter-balancing forces: 1. At first, club sizes are rigidly maintained at the previous level, and the connected official adapts to the local environment. We expect the crony's efforts to increase; 2. After a period of time, club sizes start to adjust, and the connected official will start to shirk, as argued in Corollary A1. This leads to an inverted- $U$  shaped effort curve, that when a connected official lands among unconnected colleagues, the efforts of the connected official first increase and then decrease. We provide empirical evidence of such non-monotonic efforts in the next section.

Next, we analyze the case in which there are many cronies. When there is only one non-crony agent in the population, cronies compete with each other. In particular, when the club has more than two members, the non-crony stops working completely: even if he makes it into the club, he will be dominated by at least one other crony. Consequently, the principal's problem is essentially the same as in the homogenous case with  $(n - 1)$

agents. If we consider total efforts as a proxy for the public goods the bureaucracy provides, combined with the fact that the promotion club outperforms the tournament approach when the agent population is large, the effort gains from the promotion club may compensate for the loss caused by one agent's complete lack of effort. As a result, forming a promotion club in a crony-ful environment may produce higher total efforts, and thus better total public goods provision.

PROPOSITION A2. With quadratic cost, a promotion club generates more total efforts than an  $n$ -agent tournament when  $n > 5$ .

PROOF. See Appendix of Proofs.

An immediate testable prediction follows that in an area with many connected officials, total public goods provision may be higher than an average area with few connected officials. But an area administered by unconnected officials may have below-average public goods provision and above-average levels of inequality.

## A1.2 Further Evidence

To empirically test the existence of the inverted-U shaped effort curve, we first construct measures for efforts and political connections. We use performance rankings to proxy for officials' efforts, and follow the approach used in previous studies to measure political connections: we regard a county party secretary as a crony if he/she shares the same hometown (same prefecture) with his/her direct superior, the prefecture party secretary (Meyer, Shih, and Lee 2016), and if the county party secretary is at least three years younger than the prefecture party secretary to avoid a potential competitive relationship between them (Jia, Kudumatsu, and Seim 2015). We then apply these measures to the following econometric specification:

$$(A1) \text{ Rank}_{ct} = \alpha + \beta_1 \text{Connection}_{ct} \times \text{Tenure}_{ct}^2 + \beta_2 \text{Connection}_{ct} \times \text{Tenure}_{ct} + \beta_3 \text{Connection}_{ct} + \beta_4 \text{Tenure}_{ct}^2 + \beta_5 \text{Tenure}_{ct} + \gamma X'_{ct} + \rho Z'_{ct} + \delta_c + \eta_t + \xi_{pt} + \varepsilon_{ct}$$

The specification shares the same structure as specification (A1) except the dependent variable is replaced by  $Rank_{ct}$  and the primary independent variables are replaced by  $Connection_{ct}$ ,  $Tenure_{ct}$  and their interaction terms.  $Rank_{ct}$  refers to the performance rank,  $Connection_{ct}$  refers to whether there is a political connection between the county and prefecture party secretaries, and  $Tenure_{ct}$  refers to the number of years since the county party secretary took office.

We investigate the interaction of  $Connection_{ct}$  and  $Tenure_{ct}$  and its squared term to explore the effort dynamics of connected officials. A connected official who is appointed to a new position will take advantage of a not-yet-adjusted club size to increase his effort in order to increase the probability of club inclusion. However, as time goes by, the superior officer starts to enlarge the club, and as the extended model suggests, the crony should decrease his efforts accordingly. Consequently, we predict a non-monotonic relationship between a connected official's efforts with respect to tenure years – i.e., negative  $\beta_1$  and positive  $\beta_2$ . Table A7 reports the corresponding results for both absolute and normalized performance rank<sup>31</sup> and verifies this prediction.

[ Insert Table A7 Here ]

Next, to assess the impact of crony competition on aggregated local performance, we continue to use the measure of political connections as before but aggregate them to the prefecture level. We construct the variable “Crony Share,” the ratio of the number of cronies to the total number of counties within each prefecture, which we use to test the relationship between “Crony Share” and the prefectures’ performance rank. Specifically, we apply the following econometric specification:

$$(A2) \quad Rank_{pt} = \alpha + \beta CronyShare_{pt} + \gamma X'_{pt} + \rho Z'_{pt} + \delta_p + \eta_t + \xi_{st} + \varepsilon_{pt}$$

which is similar to specification (A2) but the dependent variable is replaced by performance rank, the independent variable is replaced by crony share, and subscriptions  $c$  (indication county) and  $p$  (indicating prefecture) are replaced by

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<sup>31</sup> We normalize the rank to [0,1] with the highest rank as 1 and the lowest rank as 0. This exercise is motivated by the concern that different numbers of counties under each prefecture may reflect a varying extent of competition, which means different levels of difficulty in moving one rank higher in different prefectures (Lü and Landry 2014). We normalize the rank to the scope of [0,1] to ensure the comparability of a one-rank promotion among various prefectures.

subscription  $p$  (indicating prefecture) and  $s$  (indicating province), respectively. Table A8 reports the results based on the prefecture-year panel dataset and shows that as the share of cronies increases, i.e., in a more crony-ful environment, *more* fiscal revenue is procured.

[ Insert Table A8 Here]

The importance of the extended model and the evidence is twofold: First, we show that the intuitions of our baseline model go through, when we relax the private mindset assumption to allow for heterogeneous agents. Second, by confirming higher fiscal revenue in an environment with more cronies, we verify the incentive role of promotion clubs, that club-based promotions may provide high working incentives.

## Appendix 2: Proofs

### Proof of Proposition 1.

*Proof.* The investigation of the monotonicity of the effort curve takes three steps.

#### Step 1. FOC.

FOC for the agent is:

$$\left[ \frac{W}{m} \sum_{k=1}^m \left( \binom{n-1}{n-k} \Pi_{\#=n-k} \Phi(a_i - a_j) \Pi_{\#=k-1} (1 - \Phi(a_i - a_j)) \right) \right]' = c'(a_i)$$

We look for symmetric equilibrium, where  $a_i^* = a_j^*$ ,  $\Phi(a_i^* - a_j^*) = \Phi(0) = \frac{1}{2}$ .

To simplify it,

$$\begin{aligned} \frac{W\phi(0)}{2^{n-2}} \left[ \frac{1}{m} \sum_{k=1}^m \left( \binom{n-1}{n-k} (n-2k+1) \right) \right] &= c'(a^*) \\ \Rightarrow \frac{W\phi(0)}{2^{n-2}} \left[ \frac{1}{m} \sum_{k=1}^m \left( \binom{n-1}{k-1} (n-2k+1) \right) \right] &= c'(a^*) \end{aligned}$$

#### Step 2. Monotonicity of $\Delta(m)$ .

Denote  $\Delta(m) = \frac{1}{m} \sum_{k=1}^m \left( \binom{n-1}{k-1} (n-2k+1) \right)$ , then:

$$\begin{aligned} \Delta(m) - \Delta(m+1) &= \frac{1}{m} \sum_{k=1}^m \left( \binom{n-1}{k-1} (n-2k+1) \right) - \frac{1}{m+1} \sum_{k=1}^{m+1} \left( \binom{n-1}{k-1} (n-2k+1) \right) \\ \Rightarrow \frac{1}{m(m+1)} \left[ (m+1) \sum_{k=1}^m \left( \binom{n-1}{k-1} (n-2k+1) \right) - m \sum_{k=1}^{m+1} \left( \binom{n-1}{k-1} (n-2k+1) \right) \right] \\ \Rightarrow \frac{1}{m(m+1)} \left[ \sum_{k=1}^m \left( \binom{n-1}{k-1} (n-2k+1) \right) - m \binom{n-1}{m} (n-2m-1) \right] \end{aligned}$$

#### Step 3. Monotonicity of $g(k)$ .

Denote  $g(k) = \binom{n-1}{k-1} (n-2k+1)$ , then, for  $n \geq 2$ :

$$\begin{aligned} g(k) - g(k+1) &= \binom{n-1}{k-1} (n-2k+1) - \binom{n-1}{k} (n-2k-1) = \binom{n-1}{k-1} (n-2k+1 - \\ &\frac{n-k}{k} (n-2k-1)) \\ g(k) - g(k+1) &= \frac{\binom{n-1}{k-1}}{k} ((n-2k)k + k - (n-k)(n-2k-1)) = \frac{\binom{n-1}{k-1}}{k} (n - (n-2k)^2) \end{aligned}$$

Therefore,  $g(k = m-1) > g(m)$  if and only if  $\frac{n-\sqrt{n}}{2} + 1 < m < \frac{n+\sqrt{n}}{2} + 1$ .

Since  $n \geq 2$ ,  $1 \leq k < n$ ,  $g$  decreases in  $k$  when  $n \leq 4$ .  $g$  first increases, then decreases, and then increases in  $k$  again, when  $n \geq 5$ . It is easy to show that, at its minimal,  $g < 0$ . And  $g(n) < 0$ .

Back to  $\Delta(m) - \Delta(m + 1)$ , it essentially compares the average value of first  $m$  terms of  $\binom{n-1}{k-1}(n-2k+1)$  and the value of  $\binom{n-1}{k-1}(n-2k+1)$  at  $k = m + 1$ . Consequently,  $\Delta(m)$  first increases and then decreases, thus the hump shape when  $n \geq 5$ .

### Proof of Proposition 2.

*Proof.* Denote the optimal club size for effort as  $m_{club}$ . Then  $s(m_{club}) < s(m_{club} + 1)$ , while  $a(m_{club}) > a(m_{club} + 1)$ . It is then easy to see that  $m_{club} < m^*$  if  $\beta[s(m_{club} + 1) - s(m_{club})] > \alpha n[a(m_{club}) - a(m_{club} + 1)]$ , and  $m_{club} = m^*$  otherwise.

### Proof of Proposition A1.

*Proof.* The first part of the proposition is straightforward. When  $\beta$  is sufficiently large, i.e., the weight of survival concerns are significant, the principal biases towards large club size. To see the second part, we only need to compare the principal's choice between a tournament, and the club where  $m = 2$ . When the total agent population gets larger, increasing the club size from one to two does not distort working incentives of the non-cronies, while the benefit of discretionary power remains. Therefore for sufficiently large population,  $m = 2$  is a better choice than  $m = 1$ .

### Proof of Corollary A1.

*Proof.* The crony shirks because he knows he has better chances to be promoted, once in the club. The non-cronies shirk more because they know that, even if they make it to the club, they have no chances to be promoted, should another crony be in the club. We use a 3-agent case for illustration here. It is easy to extend to n-agent case.

Denote the crony agent as 1, and the non-connected 2,3. Denote equilibrium effort as  $a_{c,m}$  and  $a_{nc,m}$ . Suppose  $m = 2$ . For the connected agent 1 :  $\max_{a_i} p(club)W - c(a_i)$ ,  $p(club) = 1 - \Phi(a_j - a_1)\Phi(a_i - a_1)$ . FOC gives:

$$2W\Phi(a_{nc,2} - a_{c,2})\phi(a_{nc,2} - a_{c,2}) = c'(a_{c,2}).$$

For the non-connected agent  $i$  :  $\max_{a_i} p(1 \text{ ranks bottom})\frac{W}{2} - c(a_i)$ ,  $p(1 \text{ ranks bottom}) = \Phi(a_j - a_1)\Phi(a_i - a_1)$ . FOC gives:  $\frac{W}{2}\phi(a_{nc,2} - a_{c,2})\Phi(a_{nc,2} - a_{c,2}) = c'(a_{nc,2})$

Lastly the pdf of noise is symmetric,  $\phi(a_{nc} - a_c) = \phi(a_c - a_{nc})$ , we have  $a_{c,2} > a_{nc,2}$ .

Now suppose  $m = 1$ , which is a standard tournament. Base on previous results,

$\frac{(n-1)W\phi(0)}{2^{n-m-1}} = c'(a^*)$ , plug in  $n = 3, m = 1$  to get:  $W\phi(0) = c'(a_c^*)$ .

Notice that  $\Phi(a_{nc,2} - a_{c,2}) < \Phi(0) = \frac{1}{2}$ , and  $\phi(a_{nc,2} - a_{c,2}) < \phi(0)$  (distribution is symmetric), we have the proposition.

### **Proof of Proposition A2.**

*Proof.* Without loss of generality assume the quadratic cost to be  $c(a) = \frac{1}{2}a^2$ . Recall

the FOC:  $\frac{W\phi(0)}{2^{n-2}} \left[ \frac{1}{m} \sum_{k=1}^m \binom{n-1}{k-1} (n-2k+1) \right] = c'(a^*)$ . In a tournament,  $a^* =$

$\frac{W\phi(0)}{2^{n-2}} (n-1)$ , total effort  $e_{Tournament} = na^* = \frac{W\phi(0)}{2^{n-2}} (n-1)n$ .

In a crony-ful environment, when  $n$  is large, the optimal club size coincides with the size with optimal effort. This is because a crony is selected anyway. When  $n > 5$ , we know that a two-agent club is better than tournament, in terms of individual effort. In this case, if we compare the total effort between a two-agent club and the tournament, we have:

$$\begin{aligned} e_{2-agent\ club} &= (n-1) \frac{W\phi(0)}{2^{n-2}} \left[ \frac{1}{2} \sum_{k=1}^2 \binom{n-1}{k-1} (n-2k+1) \right] \\ &= (n-1) \frac{W\phi(0)}{2^{n-2}} \left[ \frac{1}{2} (n-1)(n-2) \right] \end{aligned}$$

Therefore  $e_{2-agent\ club} - e_{Tournament} = \frac{W\phi(0)}{2^{n-1}} [(n-1)(n-2) - 2n] =$

$\frac{W\phi(0)}{2^{n-1}} (n^2 - 5n + 2) > 0$ , when  $n \geq 5$ , thus completes the proof.

## Appendix 3: Figures and Tables

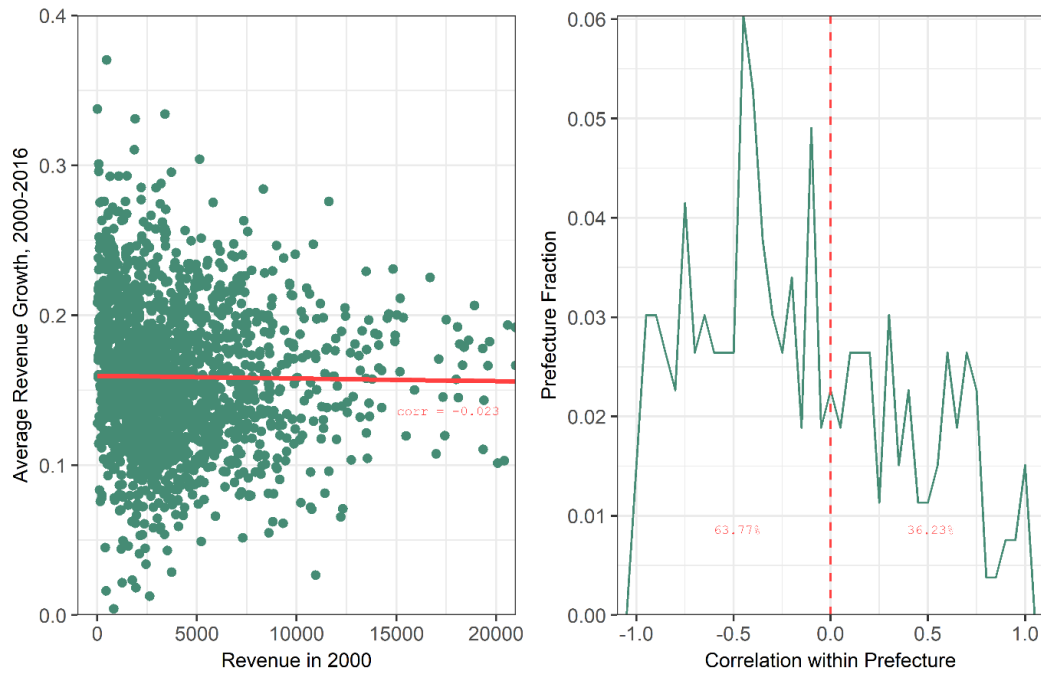


Figure A1. Correlation between Initial Revenue Level and Subsequent Revenue Growth

Notes: The left figure plots this correlation for the whole country, where each point indicates one county. The correlation is -0.023. The right figure presents the distribution of this correlation within each prefecture. There 63.77% prefectures where the within-prefecture correlation is negative, and 36.23% with positive correlations.

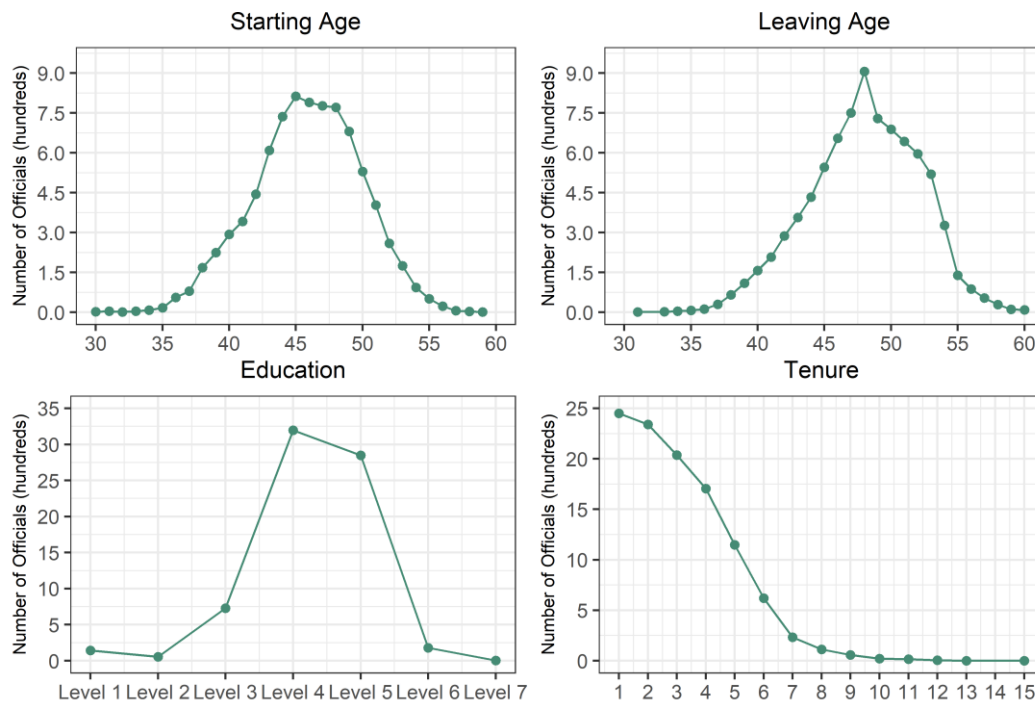


Figure A2. Personal Characteristics

Notes: For education, levels 1-7 indicate secondary school degree, high school degree, college degree, bachelor degree, master degree, PhD degree, and post-doctorate degree, respectively.

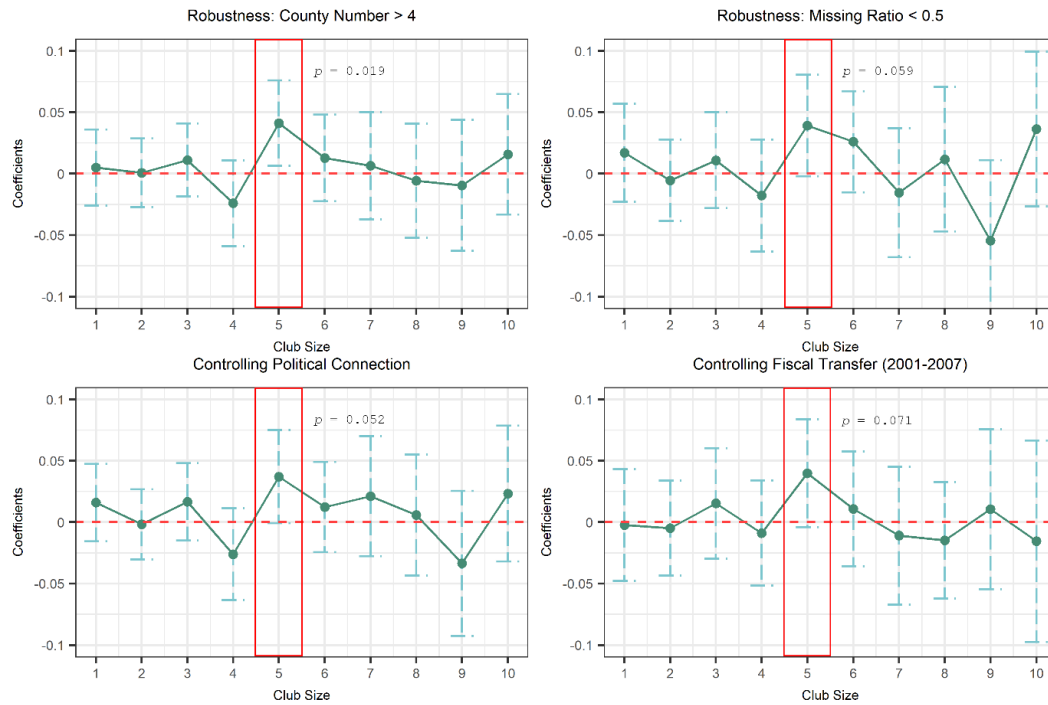


Figure A3. Robustness Checks

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. The political connection is a dummy that equals 1 if the county party secretary is connected to the prefecture party secretary, where "connected" is defined as sharing the same hometown (prefecture level) and the age difference is larger than 3 years (county secretary is younger), and equals 0 otherwise. The ranks after (including) 11 are used as reference groups.

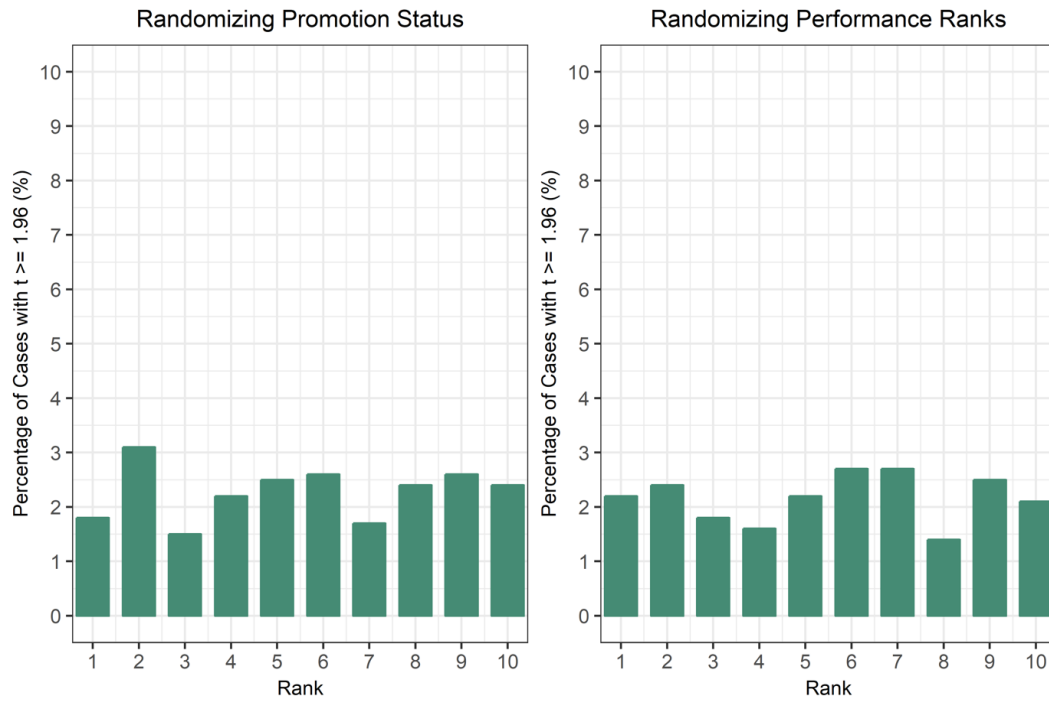


Figure A4. Randomization

Notes: In the left figure, we randomly assign the promotion status among party secretaries according to its actual distribution in our sample; in the right figure, we randomly assign performance ranks among party secretaries within each prefecture. We do the randomization and then run the regression following specification (5) 1,000 times. The bars in the figure report the percentage of all 1,000 randomizations for which we can get significant results with  $t > 1.96$  for each rank.

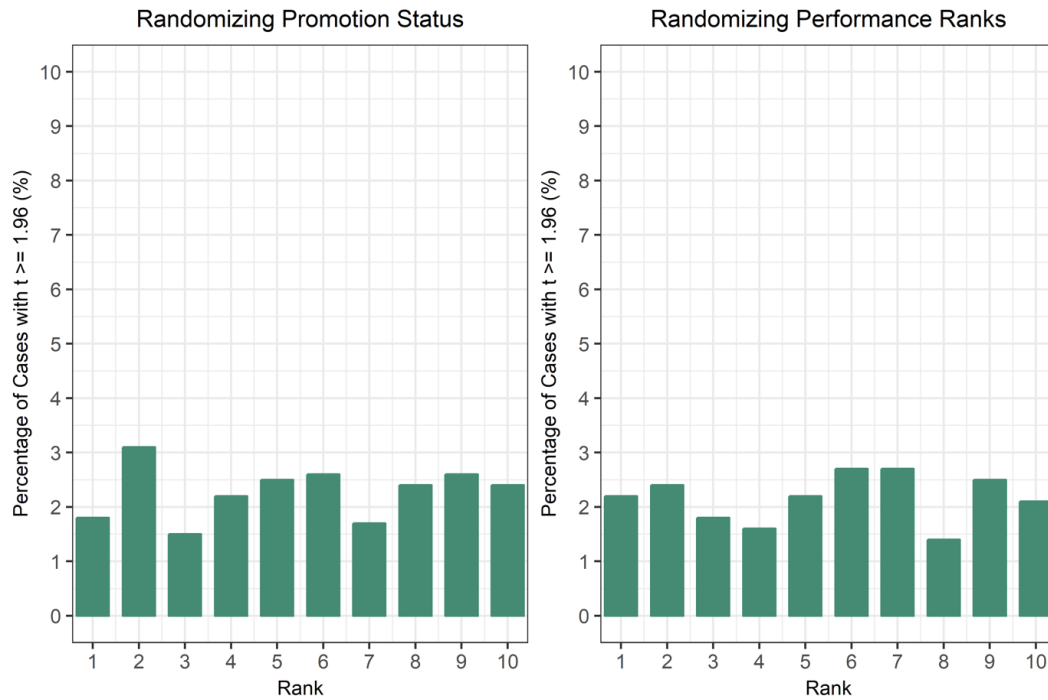


Figure A5. *De jure* Promotion

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. *De jure* promotion is defined as the actual promotion plus the following cases: the county party secretary attains Director of prefectural party committee agencies and governmental agencies, Vice Chairman of the Standing Committee of Prefectural People's Congress, Vice Chairman of the Prefectural People's Political Consultative Conference, Chief Justice of the Intermediate People's Court, Chief Procurator of the Intermediate People's Procuratorate, at the end of his/her term. The ranks after (including) 11 are used as reference groups.

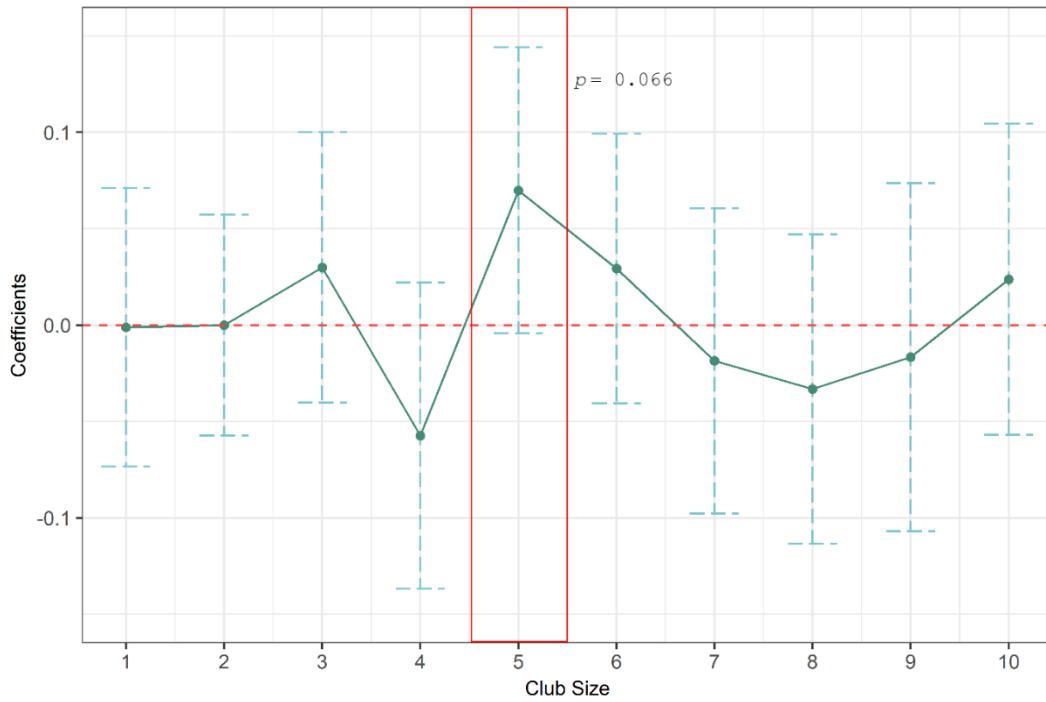


Figure A6. Robustness Check based on Low Correlation Subsample

Notes: The Low Correlation Subsample indicates prefectures where the within correlation between counties' initial revenue level and subsequent revenue growth is in  $[-0.2, 0.2]$ . The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (1), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes.

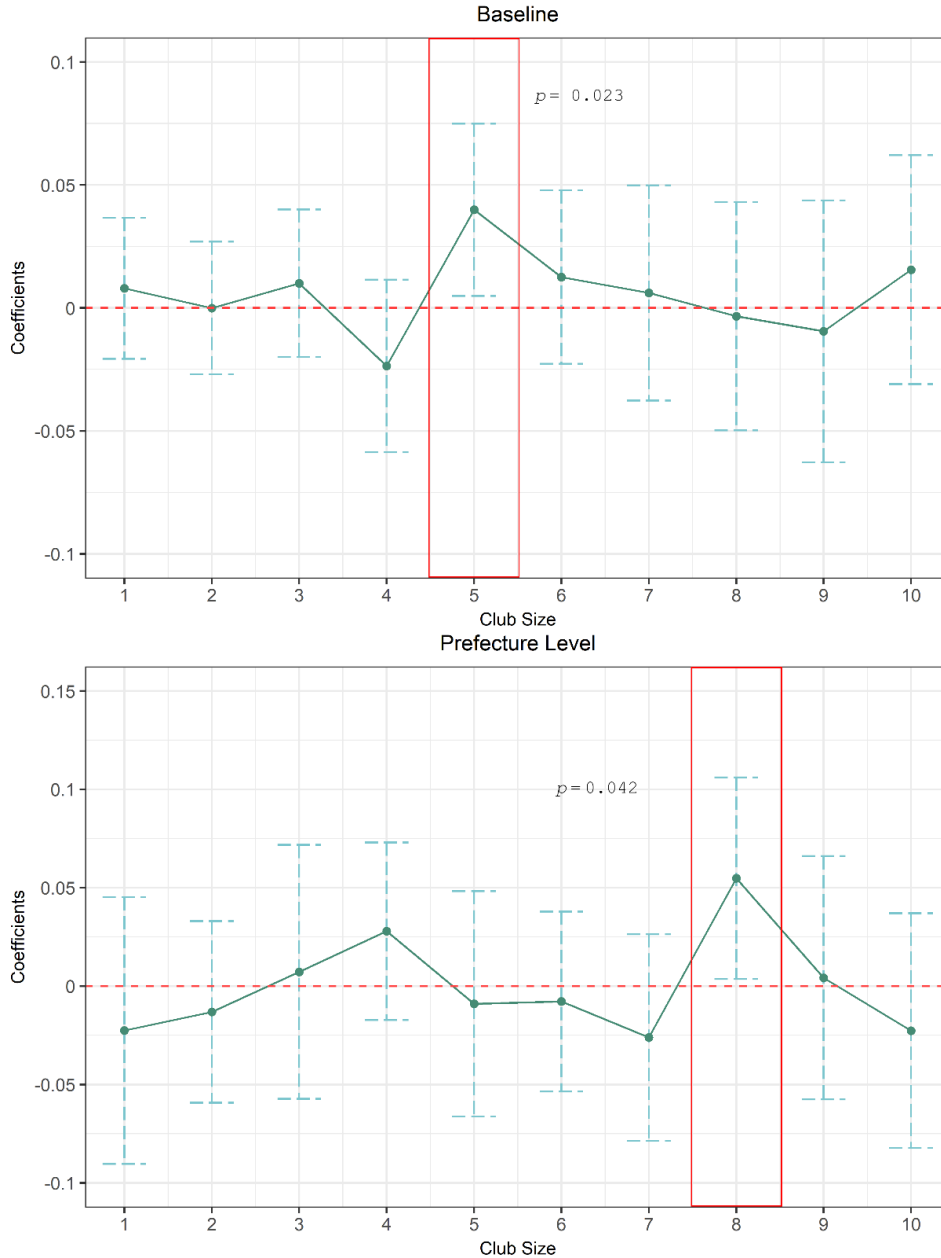


Figure A7. County and Prefecture Results with Only the First 10 Ranks

Notes: The horizontal axis corresponds to  $R_i$ s and the vertical axis corresponds to  $\beta$ . The econometric specification follows equation (5), which controls for officials' personal characteristics (including age, education year and tenure), counties' socioeconomic characteristics (including population density, fiscal revenue share within prefecture, agricultural output (log) and manufacture output (log)), county fixed effects, year fixed effects and prefecture-year fixed effects. The club sizes are indicated by red boxes. The ranks after (including) 16 are used as reference groups. This figure replicates figures 2 and 4 but drops all observations with ranks after. We skip the corresponding results for the provincial level, because in such a restricted subsample, there is insufficient freedom for us to conduct estimation and statistical inference.

Table A1 Institutional Procedure for County Party Secretary Evaluation

(1)	The representatives from Provincial Organization Department and prefecture leaders (including party secretary, deputy secretaries, and officials from Prefecture Organization Department) form a group to start the evaluation procedure and discuss specific details.
(2)	Democratic recommendations (through public conference and private talks) would be conducted in counties, and the recommended officials would be submitted to prefecture party committee.
(3)	Prefecture party committee would investigate those recommended, especially paying attention to officials' virtue, competence, diligence, and performance, and then they nominate the promotion candidates to provincial representatives. Provincial representatives would further investigate those candidates, and then provide investigation feedbacks to prefecture party committee.
(4)	Prefecture party committee and provincial representatives exchange ideas and finally decide the promotion list.
(5)	The promotion list would be announced to public for 7-15 days.
(6)	Then the promoted officials would take office for one year of probation and finally start his/her new position formally.

*Notes:* This procedure is summarized according to “Regulation on the Selection and Appointment of the Party and Government Leaders”(2014).

Table A2 Prefecture- and Province-Level Summary Statistics

Variables	Observations	Mean	Standard Deviation	Data Source
Prefecture Level				
Promotion dummy	5,526	0.240	0.427	A
Moving average fiscal revenue growth rate	5,167	0.153	0.128	B
Age	5,367	51.691	3.892	A
Years of education	5,311	18.686	2.646	A
Tenure	5,526	2.639	1.611	A
Population density	5,504	0.042	0.218	B
Fiscal revenue share within prefecture	5,512	0.083	0.099	B
Agricultural output (log)	5,514	3.280	1.050	B
Manufacture output (log)	5,514	4.482	1.413	B
Province Level				
Promotion dummy	526	0.209	0.407	A
Moving average fiscal revenue growth rate	495	0.159	0.086	C
Age	526	59.086	4.227	A
Education year	526	17.909	2.685	A
Tenure	526	2.952	1.899	A
Population density	527	0.041	0.058	C
Fiscal revenue share within prefecture	527	0.032	0.028	C
Agricultural output (log)	527	5.598	1.175	C
Manufacture output (log)	527	7.081	1.278	C

Source: A: collected by authors; B: China City Statistical Yearbook (*Zhongguo Chengshi Tongji Nianjian*), compiled by Department of Urban Surveys of National Bureau of Statistics; China Statistical Yearbook for Regional Economy (*Zhongguo Quyu Jingji Tongji Nianjian*), compiled by Department of Comprehensive Statistics of National Bureau of Statistics; C: China Statistical Yearbook (*Zhongguo Tongji Nianjian*), compiled by National Bureau of Statistics.

Table A3 Promotion Definition

	A party secretary is “promoted” if he/she attains one of the following positions upon the end of term:
County party secretary	Provincial- or national-level position
	Deputy Secretary, Secretary-General, or Member of the Standing Committee of Prefectural Party Committee
	Mayor, Vice Mayor, Acting Mayor, Assistant Mayor, or Secretary-General of Prefectural Government
	Director of Prefectural Party Committee General Office, Minister of Prefectural Party Committee Organization Department, Minister of Prefectural Party Committee Propaganda Department, Minister of Prefectural Party Committee United Front Work Department, Secretary of Prefectural Discipline Inspection Commission, Secretary of Prefectural Politics and Law Committee
	Chairman of the Standing Committee of Prefectural People’s Congress, Chairman of Prefectural People’s Political Consultative Conference
Prefecture party secretary	National-level position
	Deputy Secretary, Secretary-General, or Member of the Standing Committee of Provincial Party Committee
	Governor, Vice Governor, Acting Governor, Assistant Governor, or Secretary-General of Provincial Government
	Director of Provincial Party Committee General Office, Minister of Provincial Party Committee Organization Department, Minister of Provincial Party Committee Propaganda Department, Minister of Provincial Party Committee United Front Work Department, Secretary of Provincial Discipline Inspection Commission, Secretary of Provincial Politics and Law Committee
	Chairman of the Standing Committee of Provincial People’s Congress, Chairman of Provincial People’s Political Consultative Conference
Province party secretary	Member of the Standing Committee of the Political Bureau of the CPC Central Committee, Member of the Political Bureau of the CPC Central Committee
	Vice Premier, State Councilor of Central Government
	Secretary of Central Party Committee Secretariat, Minister of Central Party Committee Organization Department, Minister of Central Party Committee Propaganda Department, Minister of Central Party Committee United Front Work Department, Secretary of Central Discipline Inspection Commission, Secretary of Central Politics and Law Committee
	Chairman of the Standing Committee of National People’s Congress, Chairman of National People’s Political Consultative Conference

Table A4 Performance and Promotion

Panel A	Dependent Variable: Promotion Dummy			
	(1)	(2)	(3)	(4)
Absolute performance rank	0.006 (0.002)	0.007 (0.002)	0.007 (0.002)	0.006 (0.002)
Personal characteristics		Yes	Yes	Yes
Socioeconomic characteristics			Yes	Yes
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Prefecture -Year FE				Yes
Observations	22,385	17,547	17,376	16,660
R-squared	.451	.526	.527	.666
Panel B	(5)	(6)	(7)	(8)
Normalized performance rank	0.032 (0.015)	0.034 (0.016)	0.040 (0.016)	0.037 (0.018)
Personal characteristics		Yes	Yes	Yes
Socioeconomic characteristics			Yes	Yes
Prefecture FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Prefecture -Year FE				Yes
Observations	22,130	17,350	17,314	16,660
R-squared	0.451	0.527	0.527	0.666

*Notes:* Standard errors in parentheses are clustered at the prefecture level. The constant term is included but not reported. Personal characteristics include party secretaries' age, education year and tenure; socioeconomic characteristics include population density, fiscal share in the prefecture, agriculture output (log), as well as manufacture output (log). The performance rank is constructed based on the moving average fiscal revenue growth rate: the values of the absolute rank increase with the rank of the moving average fiscal revenue growth rate within the prefecture, with 1 indicating the lowest; we normalize the absolute rank in the range of [0,1] to get the normalized performance rank.

Table A5 Promotion Club

	Dependent Variable: Promotion Dummy		
	(1)	(2)	(3)
	County Level	Prefecture Level	Province Level
The first 1 rank	0.008 (0.014)	-0.022 (0.034)	-0.240 (0.174)
The first 2 ranks	-0.000 (0.013)	-0.011 (0.023)	0.071 (0.083)
The first 3 ranks	0.010 (0.015)	0.006 (0.032)	0.045 (0.096)
The first 4 ranks	-0.023 (0.017)	0.029 (0.023)	-0.128 (0.116)
The first 5 ranks	<b>0.041</b> <b>(0.017)</b>	-0.009 (0.028)	0.022 (0.084)
The first 6 ranks	0.013 (0.018)	-0.008 (0.023)	0.125 (0.099)
The first 7 ranks	0.007 (0.022)	-0.024 (0.026)	-0.049 (0.116)
The first 8 ranks	-0.005 (0.023)	<b>0.053</b> (0.025)	-0.042 (0.063)
The first 9 ranks	-0.010 (0.027)	0.005 (0.031)	<b>0.084</b> (0.047)
The first 10 ranks	0.016 (0.024)	-0.024 (0.028)	-0.062 (0.055)
Personal characteristics	Yes	Yes	Yes
Socioeconomic characteristics	Yes	Yes	Yes
County FE	Yes		
Prefecture FE		Yes	
Province FE			Yes
Year FE	Yes	Yes	Yes
Prefecture -Year FE	Yes		
Province-Year FE		Yes	
Province specific nonlinear year trend			Yes
Observations	16,660	4,858	495
R-squared	0.666	0.497	0.923

*Notes:* Standard errors in parentheses are clustered at the prefecture level in column (1) and at the province level in columns (2) and (3). The constant term is included but not reported. Personal characteristics include party secretaries' age, education year and tenure; socioeconomic characteristics include population density, fiscal share in the prefecture, agriculture output (log), as well as manufacture output (log). The performance rank is constructed based on the moving average fiscal revenue growth rate. Province-specific nonlinear year trend contains the interactions of

province dummies with year (to the power of 1 to 5). The ranks after (including) 11 are used as reference groups.

Table A6 Missing Values and Ranks

	(1)	(2)
	Missing	Missing
Rank 1	0.004 (0.011)	0.004 (0.025)
Rank 2	-0.013 (0.011)	0.000 (0.025)
Rank 3	-0.003 (0.012)	0.013 (0.025)
Rank 4	-0.001 (0.011)	0.016 (0.025)
Rank 5	-0.000 (0.013)	0.017 (0.025)
Rank 6	0.014 (0.016)	0.017 (0.025)
Rank 7	-0.014 (0.017)	0.003 (0.024)
Rank 8	0.025 (0.019)	0.017 (0.024)
Rank 9	-0.002 (0.022)	-0.008 (0.024)
Rank 10	-0.006 (0.023)	-0.006 (0.023)
County FE	Yes	Yes
Year FE	Yes	Yes
Prefecture -Year FE	Yes	Yes
Observations	29798	29798
R-squared	0.508	0.508

*Notes:* Standard errors in parentheses are clustered at the prefecture level. The constant term is included but not reported. In column (1), Rank  $i$  indicates the first  $i$  ranks, and in column (2), Rank  $i$  indicates the  $i$  –  $th$  rank.

Table A7 Crony Efforts Dynamics

Dependent Variable: Fiscal Revenue Growth Rank	Absolute Rank		Normalized Rank	
	(1)	(2)	(3)	(4)
Connection dummy × Tenure squared	-0.073 (0.030)	-0.090 (0.032)	-0.011 (0.004)	-0.013 (0.004)
Connection dummy × Tenure	0.308 (0.220)	0.336 (0.243)	0.063 (0.028)	0.066 (0.033)
Connection dummy	-0.151 (0.399)	-0.112 (0.520)	-0.073 (0.052)	-0.076 (0.069)
Tenure squared	-0.028 (0.012)	-0.035 (0.016)	-0.003 (0.001)	-0.004 (0.001)
Tenure	0.218 (0.075)	0.266 (0.101)	0.027 (0.007)	0.035 (0.010)
Personal characteristics	Yes	Yes	Yes	Yes
Socioeconomic characteristics	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Prefecture -Year FE		Yes		Yes
Observations	17,263	16,636	17,211	16,636
R-squared	0.541	0.593	0.305	0.380

*Notes:* Standard errors in parentheses are clustered at the provincial level. The constant term is included but not reported. Personal characteristics include party secretaries' age, education year and tenure; socioeconomic characteristics include population density, fiscal share in the prefecture, agriculture output (log), as well as manufacture output (log). The connection dummy equals 1 if the county party secretary is connected (same hometown/prefecture level) to the prefecture party secretary, where the age difference is larger than 3 years (county secretary is younger), and equals 0 otherwise. Tenure denotes the number of years since the county party secretary took office.

Table A8 Crony Share and Aggregate (Prefectural) Performance

Dependent Variable: Fiscal Revenue Growth Rank	Absolute Rank		Normalized Rank	
	(1)	(2)	(3)	(4)
Crony share	1.268 (.533)	1.223 (.568)	0.099 (.048)	0.097 (.050)
Personal characteristics	Yes	Yes	Yes	Yes
Socioeconomic characteristics	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Province -Year FE		Yes		Yes
Observations	4,284	4,277	4,283	4,277
R-squared	0.355	0.377	0.231	0.262

*Notes:* Standard errors in parentheses are clustered at the provincial level. The constant term is included but not reported. Personal characteristics include party secretaries' age, education year and tenure; socioeconomic characteristics include population density, fiscal share in the prefecture, agriculture output (log), as well as manufacture output (log). The crony share is the share of connected county secretaries with each prefecture.