



China's Local Political Turnover in the Twenty-First Century

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Abstract

This paper provides empirical evidence on the incentive role of personnel control in China in the twenty-first century. Employing the city-level turnover data of political leaders in China between 2000 and 2018 and utilizing the fixed effects ordered logit model, we find that the likelihood of promotion of local leaders rises with their economic performance. This relationship holds more firmly in the municipal party secretary. The probability is also found to decrease with the economic performance of their immediate predecessors and neighboring cities. This finding is robust to various robustness tests. We interpret the finding as evidence that the relative economic performance (peer effects) also contributes to the local political turnover, in particular within a province. Moreover, after the Third Plenary Session of the 18th CPC Central Committee, a material change in the personnel arrangement within the party arises and this promotion mechanism shows a dynamic change. Our study sheds some light on the growing literature emphasizing the relationship between political turnover and economic performance.

Keywords Local political turnover · Absolute economic performance · Relative economic performance

JEL H7 · J63 · P3

Introduction

Does China's local political turnover change in the twenty-first century? This paper attempts to answer this question given our motivation and contribution in at least three ways. First, China's performance-based promotion remains to be a critical

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perspective to understand the incentives and behaviors of Chinese local leaders, and we need to know whether it still works in China in the twenty-first century. Second, there has been a big shift in local leaders' performance evaluation since the Third Plenary Session of the 18th CPC Central Committee, as revealed from the government documents issued from the center. However, how it played out in reality remains to be an empirical issue. We extend the data into 2018 to enable this examination. Third, we add a test of relative performance evaluation in a spatial structure following the work of Yu et al. [21], which is one contribution of this paper to the existing literature that directly tests the relationship between promotion and GDP performance.

Several studies regarding the turnover of China's political elite have been interpreted as the relationship between China's economic development and polity. The existing literature has put forward two principal explanations about the political turnover. On the one hand, some scholars pay attention to the effect of political faction on the mechanism of government officials' promotion. For example, Choi [4] finds that the promotion of provincial leaders is related to their own faction. Furthermore, Li and Zhang [9] show that officials with limited connection, compared to those possessing closed contact with senior leaders, have to put more effort in order to get promoted, while Fisman et al. [6] emphasize the impact of sharing a hometown or college with an incumbent member of China's Politburo on the likelihood of a candidate entering the group.

On the other hand, the current literature focuses on how economic performance affects the likelihood of promotion of political officials. One seminal paper is Li and Zhou [10], who present empirical evidence on the association between the turnover of provincial leaders in China and their economic performance over the period of post-reform, and find that the likelihood of promotion of political leaders rises with their economic performance, whilst their likelihood of termination falls with economic performance. The logic is that China employs personnel control to result in desirable economic outcomes. Additionally, due to the smaller size of provincial sample and relatively limited impact of provincial leaders on their economic growth, a series of literature concentrating on the relationship between the city-level leaders' turnover and economic achievement arises [2, 14, 20].¹

Despite their own economic performance, the promotion of China's local officials is likely to be relevant to the performance of other regions and their immediate predecessors [2, 3], which underpins the importance of economic growth in the incentives of officials' promotion. China's personnel selection targeted at economic growth, to some extent, has its own peculiarity, whilst Russia, which occupies a similar system of centralized personnel selection, does not manifest this effect on political turnover of economic success [13]. This institutional feature has a direct influence on the behavior of China's local government. This can explain some current phenomena in China, such as the control of land by local governments [24], and the level of pollutant emissions [26].

¹ Recently, a number of articles further work on the effect of China's local political turnover or policy uncertainty on firm investment [11, 12], while Zhang et al. [25] emphasize the importance of local leaders during the prevention and control of COVID-19 in China.

Although evidence abounds of the effect of economic performance on political turnover, a set of literature has challenged this argument. Tao et al. [17] believe that a complicated evaluation criterion lies in the promotion system of government officials in China, and the reconfirmation of criterion is likely to result in an insignificant influence of economic achievement. Shih et al. [15] instead apply a new dataset of central government officials, and find that economic growth does not significantly affect their career advancement. Moreover, Su et al. [16] discover that once we adjust some key variables' codes in error, the Li and Zhou [10] findings can be contrary. More recently, Gao [7] argues that both age restrictions and native cadres make local leaders ineligible for advancement.

There are three main limitations in the existing literature working on the political turnover of local leaders in China. First, the current research concerning city-level turnover mainly focuses on the pre-2010 sample, showing to some extent, a limited sample size. This neglects the change in the personnel system within the Communist Party of China, and in the meantime, cannot distinguish between the advancement path for the municipal party secretary and that for the mayor. Compared with the municipal party secretary, the mayor is just in a subordinate status in the power of structure, playing a less important role [23], and therefore the mechanism of promotion potentially differs. Second, the definition of both promotion and termination of local leaders in the existing literature is unclear, and this definition is crucial to the empirical results. Third, current studies pay more attention to the economic performance of the regions the local leaders in charge, rather than the inter-regional relative performance. Given the city-level characteristics, one possible conjecture is that the promotion and termination of city leaders are related to the neighboring cities' economic performance within the same province. As a result, this paper constructs a panel of city-level data over the period from 2000 to 2018, and attempts to examine the probability of promotion and termination for local leaders.

Our analysis utilizes the data on China's local government officials and adopts the approach of the fixed effects ordered logit model to document three main findings. First, the likelihood of promotion of city-level leaders increases with their economic performance, and this turnover is more sensitive to their annual performance rather than to their average performance. Second, the relationship between the probability of promotion and the local leaders' economic performance holds more firmly in the municipal party secretary, and this probability is also found to fall with the relative economic performance (i.e., the economic performance of their immediate predecessors and neighboring cities). Third, the municipal party secretary own economic performance plays a vital role in their promotion in the cities with higher income level or larger population size, otherwise the peer effects contribute more to the secretary's turnover.

We believe that this paper makes three crucial contributions to the current literature. First, this paper sorts out a panel of China's city-level data over the period 2000 to 2018 regarding the turnover of mayor and municipal party secretary. It likewise offers a clear classification of their turnover based on practical experiences and interviews with government insiders. Second, we develop the spatial econometrics model to include the geographical weighted economic performance of neighboring cities as a key explanatory variable, and further distinguish the

impact of administrative boundary as a consequence of whether it belongs to the same province. The identification strategy of current empirical research employs the ordered probit model, while this methodology cannot include the fixed effects in the analysis, bringing about an appearance of endogenous problem. Therefore, our third contribution is to utilize the “blow-up and cluster” estimation proposed by Baetschmann et al. [1] to employ the fixed effects ordered logit model, improving the empirical strategy.

This paper is also related to the literature on the role of relative performance evaluation in political turnover [3]. Chen et al. [3] show that the turnover of top provincial leaders in China is not only related to their own performance, but also related to the performance of their immediate predecessors. The turnover of local leaders we investigate on differs from their assessment in at least three ways. First, we extend to the city-level dataset and reveal a negative effect of the economic performance of neighboring cities. However, in Chen et al. [3], the estimated coefficient of the performance of neighboring provinces is insignificant. Second, we consider the impact of distance and employ a spatial econometrics model to construct the geographical weighted economic performance of neighboring cities, whilst Chen et al. [3] only capture the average GDP growth of neighboring provinces. Third, we further split the relative economic performance into that within the same province or not. Conversely, Chen et al. [3] hardly test this effect because they work on the turnover of provincial leaders.

The remainder of the paper is organized as follows. The next section briefly presents the institutional background pertaining to the prefectural leaders' turnover. Section 3 outlines the data and econometric specification. Section 4 contains the empirical results, and the last section concludes.

Turnover of Prefectural Leaders

The state administration of China is mainly composed of five layers: the center, provinces, prefectures, counties, and townships. There are a total of 333 prefectures, located in the middle layer of the administration. It is made of 293 prefectural-level cities, 7 areas (*diqu*), 30 autonomous prefectures (*zizhizhou*), and 3 leagues (*meng*). Under the premise that the area the township and county government in charge is relatively small and that the provincial government in charge is relatively large, prefectures have already become the key unit of China's economic development, such as the recent rise of metropolitan area that builds upon the city spatial morphology. Therefore, prefectures can be treated as an object to analyze the relationship between China's political system and its status of economic development.

According to the specific political institution in China, there are two leaders at each level of political hierarchy: one is responsible for the party affairs in the region in charge, and the other one is the chief executive. In principle, the rank of the leader who is in charge of the party affairs is higher than the executive leader. For example, while both prefectural leaders (i.e., mayor and municipal party secretary) share

the same executive level, the actual position of municipal party secretary is higher than the mayor. Since the municipal party secretary and the mayor have different prospects of career, this paper separately defines and classifies the turnover for both leaders under the consideration of China's specific political background. Following the study of Li and Zhou [10], this paper defines the turnover of officials in three main types: promotion, same level, and termination. The existing literature working on the officials' turnover in China mainly focuses on the provincial level. However, as provincial leaders (i.e., provincial party secretary and governor) are commonly older and are imbued with higher political level, the outcomes of the turnover are relatively limited (i.e., to the central government department, or the provincial people's congress), resulting in a relatively clear classification. Note that prefectural leaders are widely younger and climbing the career ladder, and thus their turnover is somehow complicated. The definition and classification for prefectural leaders in the current literature are unclear, and this effectiveness of identification is directly related to the credibility of empirical results.

Based on our manual reorganization and classification, we find that there are a dozen types of outcomes of prefectural leaders. Most of their career prospects are confined to the same province, with 98.34% and 92.21% for the municipal party secretary and mayor, respectively, still serving in the same province. Since there are limited positions in the higher ladder, the prefectural leaders have to face a fierce competition within a province. Our analysis defines the turnover of prefectural leaders based upon two criteria. First, we classify it by the administrative level. According to the *Civil Servant Law of People's Republic of China*, the position of leadership can be regarded as national-level principal, national-level deputy, provincial-level principal, provincial-level deputy, bureau-level principal, bureau-level deputy, county-level principal, county-level deputy, township and division-level principal, and township and division-level deputy. There is a strict order among different levels. As a result, we can roughly judge whether the prefectural leader is getting promoted, serving the same level, or getting terminated, based on the change in their administrative level. For example, if the prefectural leader serves a position of provincial-level deputy, coming from the position of bureau-level principal, then we can treat him or her as promoted.

However, the position outcomes of prefectural leaders are varying, and several positions can hardly be judged by means of their administrative level (i.e., the ordinary positions in the provincial people's congress and Chinese people's political consultative conference are also sharing the same level as prefectural leaders, whilst their actual authority is far less than that of prefectural leaders), and hence we can consider this as termination. Therefore, the second criterion this paper utilizes is the actual authority in the position the leaders serve. This classification is mainly building upon the long-run cognition of Chinese politics through the media coverage, combined with the correction and re-confirmation after the interviews with governments' insiders, to determine the prospect of different positions but sharing the same administrative level. For instance, as for the positions serving at universities and firms, the actual authority they occupy is far less than that of prefectural leaders, and consequently, the lower ladder of the administrative level can be treated as their real position layer.

In relation with these two criteria, the paper separately defines the turnover for the municipal party secretary and mayor.² In terms of promotion, it is common for the mayor to be promoted as the municipal party secretary (in the same city or another city). If the municipal party secretary or mayor serves a new position in the central government (i.e., ministry-level deputy), a provincial-level leader (i.e., deputy governor or standing committee), or a leader in a provincial capital city or sub-provincial city (i.e., party secretary in a provincial capital city), then this can be defined as a promotion. In addition, some municipal party secretaries or mayors are transferred to be the top executives at central government-owned enterprises, holding an administrative level of ministerial principal. Such can also be regarded as a promotion. With regard to serving at a post of the same level, it is common for the prefectural leaders to start a new job at the provincial department (i.e., communications department or education department), or serve a deputy position in a higher administrative level city (i.e., transfer from a post of mayor in an ordinary prefectural city to a post of deputy mayor in a sub-provincial city). Furthermore, for the turnover that serves as a new post in the court and procuratorate, despite a rise in the administrative level, we still treat it as the same level given the actual authority. Lastly, apart from the retirement, discipline violation, and death, this paper also includes the prefectural leaders, who are further entering the provincial or city-level people's congress as well as Chinese people's political consultative conference and serving as an ordinary post, as a termination.

As can be seen from the above analysis, the career prospects for municipal party secretary and mayor differ, and the definition of promotion or not is also distinct. The actual condition of the prefectural leaders' turnover is intricate and complex, and hence, this paper attempts to realistically describe and deliver the message of the turnover to avoid any measurement errors because of an unreasonable setting.

Data and Econometric Specification

This paper collects the detailed individual data of municipal party secretaries and mayors over the period of 2000 to 2018. The data is extracted from the Baidu encyclopedia, the official website of different governments, and the Chinese Political Elite Database.³ As we can observe from Fig. 1, the probability of promotion is quite high for both municipal party secretaries and mayors. This is because the prefectural leaders are generally younger than the provincial leaders, and thus they will to some extent have better career prospects. Compared with mayors, the frequency of promotion of municipal party secretaries is relatively small, as the promotion path for mayors is wider (i.e., can be promoted to be the municipal party secretary). With the increase in the administrative level, the position the officials face becomes less, and as a result, it is accepted that the promotion of municipal party secretaries is more difficult than their counterpart – mayor. This indicates that these two local leaders are confronted with different incentive mechanisms of promotion.

² The detailed definition and classification of local political leaders' turnover were collected and sorted by the authors, and available upon request.

³ <https://www.junyanjiang.com/data.html> (accessed October 19, 2020).

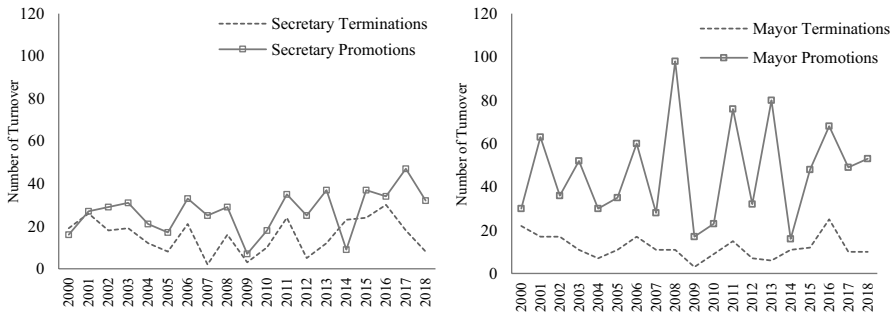


Fig. 1 The turnover of municipal party secretary and mayor, 2000–2018

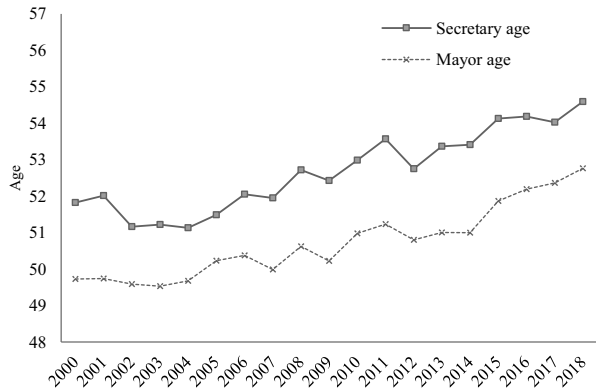
As can be observed in Fig. 2, the average age of China's local leaders presents a rising trend. Such trend is related to the background of population aging and postponed retirement. This figure also shows that the municipal party secretary is in average around two years older than the mayor. This also reflects that some of mayors ultimately get elevated to the post of municipal party secretary when they grow older, showing a strict order between these two posts.

As for the education background, Fig. 3 shows that the scale of local leaders who are with the knowledge of science and engineering displays a stabilized trend, whilst those with economics and management knowledge increase over the period 2000–2013. This is associated with China's high growth rates during the same period, and indicates that the prefectural leaders are willing to improve the local level of economic development through learning related knowledge of economics and management.

However, this trend has been reversed since 2013, which can be interpreted as the material shift in the personnel arrangement within the party after the Third Plenary Session of the 18th CPC Central Committee.⁴ One key signal is that the *Decision of the Central Committee of the CPC on Several Major Issues of Comprehensively Deepening Reform* was adopted at the Third Plenary Session, including the fields of economy, politics, culture, ecological civilization, and national defense and armed forces. Given this general guideline, a crucial turnaround in personnel management was implemented practically in China. For example, in late 2013 the organization department of the central committee issued the *Notice on Improving the Performance Evaluation of Local Party and Government Leaders and Leading Cadres*, and clarified that the evaluation of local cadres is no longer simply regarded as economic performance. Specifically, this notice advances eight aspects to improve the cadre evaluation system. First, the performance evaluation should highlight the scientific development orientation. Second, improve the performance evaluation indicators. Third, the regional GDP will no longer be assessed for restricted development areas. Fourth, strengthen the assessment of government debt situation. Fifth, strengthen the comprehensive analysis of political achievements. Sixth, the appointment of officials cannot simply consider regional GDP and its growth rate. Seventh, implement

⁴ Enormous political changes have taken place in China since Xi Jinping became the General Secretary of the Communist Party of China (CPC) [8, 18].

Fig. 2 The average age of municipal party secretary and mayor, 2000–2018



accountability. Eighth, standardize and simplify various work assessments. Moreover, the revised version of the *Regulations on the Selection and Appointment of Party and Government Leading Cadres* issued in early 2014 also specifies the new criteria of cadres' appointment, which requires to pay more attention to the indicator of people's livelihood (i.e., household income) in the evaluation. Therefore, it is worthwhile to explore whether the mechanism of China's GDP tournament mode changes before and after 2013. The expectation is that economic performance will be more strongly related to the turnover of local leaders in the pre-2013 subsample.

In terms of tenure, its distribution for municipal party secretaries and mayors is displayed in Table 1. The minimum tenure of city-level political leaders is only one year, while the maximum is 12 years. As can be seen from the figure, around 72% of mayors and 80% of municipal party secretaries are with the tenure less than four years. This implies that the turnover of local leaders happens frequently. Precisely, the tenure of municipal party secretaries mainly concentrates on the short term, relative to mayors. Table 2 contains descriptive statistics of the variables used in the regression analysis.

Following Li and Zhou [10], we employ a series of control variables in the empirical analysis, including both the individual-level characteristics of prefectural leaders (i.e., education level – a dummy variable that equals one if the leader holds a postgraduate degree and zero otherwise, tenure, and age) and the characteristics of the city they serve (i.e., the natural logarithm of income level). Moreover, given that

Fig. 3 The professional knowledge of municipal party secretary and mayor, 2000–2018

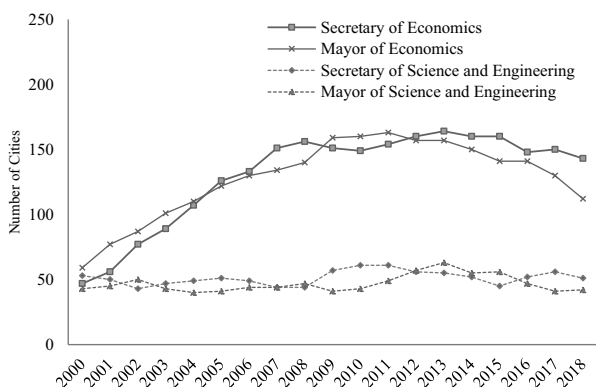


Table 1 Tenure distribution of municipal party secretary and mayor

Tenure	Municipal party secretary			Mayor		
	Frequency	%	Cumulative %	Frequency	%	Cumulative %
1	669	11.09	11.09	130	2.11	2.11
2	1,709	28.32	39.40	1,682	27.26	29.36
3	1,439	23.84	63.25	1,486	24.08	53.44
4	1,023	16.95	80.20	1,144	18.54	71.98
5	627	10.39	90.59	792	12.83	84.82
6	344	5.70	96.29	519	8.41	93.23
7	114	1.89	98.18	240	3.89	97.12
8	59	0.98	99.15	114	1.85	98.96
9	30	0.50	99.65	43	0.70	99.66
10	13	0.22	99.87	17	0.28	99.94
11	6	0.10	99.97	3	0.05	99.98
12	2	0.03	100.00	1	0.02	100.00
Sum	6035	100		6171	100	

The table gives the distribution of tenure for both municipal party secretary and mayor

the turnover of local leaders hinges on the economic performance relative to their immediate predecessors [3], we thus include the average GDP growth performance of the immediate predecessor as a further control in the empirical analysis.

In addition, the promotion of local leaders, as mentioned above, is not only determined by their own economic performance, but also related to the relative performance of other regions, which indicates an interaction of strategy among local governments. According to the Tobler's First Law of Geography, everything is related to everything else, but things that are near each other (governments) are more related. Yu et al. [22] also use the methodology of spatial econometrics to find a competition relation between neighboring governments in China. Therefore, this paper argues that the promotion of local government leaders is also related to the economic performance of neighboring cities. According to this hypothesis, we utilize the factor of geographical distance to construct a variable of geographical weighted economic growth, $wgrowth_{it}$:

$$wgrowth_{it} = Z_{score} \sum_{j \neq i} w_{ij} growth_{jt} \quad (1)$$

where $growth_{jt}$ denotes the economic growth of other cities, and w_{ij} captures the weight of geographical distance. Following the method of spatial econometrics, w_{ij} is obtained as follows:

$$w_{ij} = \frac{1}{d_{ij}^2} \quad (2)$$

where d_{ij} measures the geographical distance between two observed cities. To avoid a large magnitude of the coefficient relating to the weighted growth, we use the Z-score method to standardize, and then obtain the variable of $wgrowth_{it}$.

Table 2 Descriptive statistics

	Obs	Mean	Std. dev	Min	P50	Max
Secretary turnover	6171	1.03	0.36	0.00	1.00	2.00
Mayor turnover	6035	1.11	0.42	0.00	1.00	2.00
growth	5557	0.10	0.07	-0.40	0.10	0.76
wgrowth	5994	0.02	1.02	-20.15	-0.13	20.53
w ¹ growth	5994	0.01	1.02	-21.65	-0.17	21.38
w ² growth	5994	0.04	1.01	-2.84	-0.12	7.82
Secretary growth	5790	0.10	0.06	-0.23	0.10	0.45
Secretary wgrowth	6327	0.00	1.00	-2.31	-0.15	18.89
Secretary w ¹ growth	6327	-0.00	1.00	-2.17	-0.19	19.71
Secretary w ² growth	6327	-0.00	1.00	-2.16	-0.17	6.02
Mayor growth	5662	0.10	0.06	-0.40	0.10	0.73
Mayor wgrowth	6327	0.00	1.00	-3.77	-0.15	17.52
Mayor w ¹ growth	6327	0.00	1.00	-4.28	-0.19	18.25
Mayor w ² growth	6327	0.00	1.00	-2.52	-0.17	5.93
Secretary pred_growth	4854	0.10	0.05	-0.19	0.10	0.35
Secretary education	6327	0.65	0.48	0.00	1.00	1.00
Secretary tenure	6171	3.69	1.69	1.00	3.00	12.00
Secretary age	6037	52.67	3.88	36.00	53.00	62.00
Mayor pred_growth	4866	0.10	0.05	-0.35	0.10	0.36
Mayor education	6327	0.63	0.48	0.00	1.00	1.00
Mayor tenure	6035	3.22	1.64	1.00	3.00	12.00
Mayor age	5910	50.75	4.04	35.00	51.00	63.00
ln(GDP)	6207	5.99	1.17	1.44	6.03	9.46

The table gives descriptive statistics for the variables. *Secretary turnover* and *Mayor turnover* respectively represent the turnover of municipal party secretary and mayor (0=termination, 1=same level, 2=promotion). *growth* is the growth rate of GDP. *wgrowth* is the geographical weighted GDP growth of neighboring cities. *w¹growth* and *w²growth* respectively represent the geographical weighted GDP growth of neighboring cities in the same province and in different provinces. *pred_growth* is the average GDP growth of the immediate predecessor. *education* is the education level of the local leader (postgraduate=1, lower=0). *tenure* is the number of years a leader has been in the post. All GDP measures are calculated at 2000 constant prices

As shown above, the promotion path for the city-level leaders is mainly limited to the same province, and thus their promotion is more likely to be influenced by the economic performance of other cities within the province. We name this as the provincial boundary effect. In our analysis, the effect of the provincial boundary implies that the strategy interaction among different cities is affected by whether they belong to the same province. If this effect exists, then the promotion of local leaders is more sensitive to the economic performance of neighboring cities within the same province. The theoretical grounding regarding the provincial boundary effects also applies in the China's government system research. Yu et al. [21] prove that the spatial effect of China's government investment is normally limited to the provincial boundary. This means that the investment competition among local governments is centralized within the province. To explore this effect, we further investigate the

weight of geographical distance, w_{ij} , and split it into the weight of geographical distance within the same province, w^1_{ij} , and the weight of geographical distance outside the province observed, w^2_{ij} :

$$w^1_{ij} = \begin{cases} \frac{1}{d^2_{ij}}, & \text{if two cities are located in the same province} \\ 0, & \text{if two cities belong to different provinces} \end{cases} \quad (3)$$

$$w^2_{ij} = \begin{cases} \frac{1}{d^2_{ij}}, & \text{if two cities are located in different provinces} \\ 0, & \text{if two cities belong to the same province} \end{cases} \quad (4)$$

To sum up, the model central to this empirical analysis is

$$y_{it} = \alpha_0 + \beta \times growth_{it} + \theta \times wgrowth_{it} + \mathbf{x}'_{it}\Gamma + \alpha_i + \eta_t + u_{it} \quad (5)$$

where i represents each city, t represents each time period, and u_{it} is the error term. The left-hand-side variable, y_{it} , is a measure of the political turnover in city i in year t , with the value of 0 (termination), 1 (same level), or 2 (promotion). We have two variables of interest. The first is the economic growth of the city the leaders serve, $growth_{it}$, measuring their economic performance.⁵ The coefficient, β , hence indicates the impact of the absolute economic performance on political turnover. Another variable of interest here is the geographically-weighted economic growth of other cities, $wgrowth_{it}$, capturing the economic performance of neighbors. The coefficient, θ , hence indicates the impact of the relative economic performance on political turnover. Control variables are included in the vector \mathbf{x}_{it} , including both leaders individual-level characteristics and city-level characteristics. We also include a year-specific dummy variable, η_t , to control for shocks and trends that shape political turnover over time, and a city-specific dummy variable, α_i , to control for time-invariant, unobserved city characteristics that influence political turnover across cities. Standard errors are clustered at the city level due to the potential correlation of error, u , within a city.

For the estimation of the order-typed dependent variable, the common methodology in the current literature is to employ the ordered probit model [10]. However, one limitation of this methodology is hardly to include the fixed effects, which results in a potential problem of endogeneity. Following the method put forward by Baetschmann et al. [1], this paper utilizes the “blow-up and cluster” (BUC) estimation to employ the fixed effects ordered logit model, in order to improve the validity of empirical results. Baetschmann et al. [1] show that the BUC estimator has good properties (i.e., it is simple to implement and its maximization process is stable) and is almost as efficient as more complex estimators such as generalized method-of-moments and empirical likelihood estimators.⁶

⁵ As the economic performance can only be observed and evaluated in the years before the leaders' turnover year, this paper uses the lagged year(s) performance in the following analysis.

⁶ Some issues have received attention in the context of the probit model [19]. First, the same issues concerning endogenous explanatory variables in linear models also arise in probit models. The second is nonnormality of the error term in the latent variable model. A third specification problem, also defined in terms of the latent variable model, is heteroskedasticity in the error term.

Evidence

Baseline Estimation Results

This section is to test whether and how the turnover of local political leaders across different cities systematically changes with economic performance. Column 1 of Table 3 is a simple specification with just a measure of economic performance in the city the leaders are in charge, the annual GDP growth rate, in the presence of city and year fixed effects, using annual data regression, with robust standard errors clustered by city. This shows the raw correlation and we see a positive and significant relationship. Column 2 then extends column 1 to employ a series of control variables, including officials individual-level characteristics (i.e., education level, tenure, and age) and city-level characteristics (i.e., income level and the average GDP growth performance of the immediate predecessor). The results using full controls support those already found. Column 3 further extends column 2 to add a variable of geographically-weighted economic growth of neighboring cities, $wgrowth_{it}$, on the right-hand side, and then split it into two variables: the geographical weighted GDP growth of neighboring cities in the same province, $w^1growth$, and that outside the province observed, $w^2growth$, in column 4. In these specifications the sign of the coefficient estimate relating to annual GDP growth rate in the city the leaders serve is positive in all cases, and statistically significant. This is consistent with our argument – a better economic performance leads to a higher probability for the local leaders to get promoted, which reflects that the mechanism of promotion evaluation and appointment targeted at economic performance does exist at local level in China. Using the estimate from column 4 of Table 3, the marginal effect of economic growth on promotion (turnover=2) is 0.105, and its effect on termination (turnover=0) is -0.037.

Columns 5–8 repeat columns 1–4 but instead use an alternative measure of economic performance, the average GDP growth rate. The raw correlation again confirms a positive and significant relationship, whilst the significance levels decline with an inclusion of control variables. This indicates that the turnover of city-level political leaders is more sensitive to their annual performance rather than to their average performance during the tenure, in contrast to Li and Zhou (2005) who focus on the provincial leaders. Taking a frequent transfer of personnel at the city level into account, we observe a phenomenon of shortened tenure of officials in recent years. As we can see from Table 1, more than half of local leaders are with the tenure less than three years. Therefore, as an evaluation of promotion, the concentration on the recent performance of local leaders partially contributes to that the average GDP performance does not bite for turnover outcomes but the annual GDP performance does.

In Table 3, the results relating to the control variables are of some interest. There is a positive relationship with education level, which likely indicates a greater potential to get promoted in the local leaders with higher education. The marginal effect of education level on promotion and termination is 0.025 and -0.009 respectively, implying that the likelihood of promotion for the educated leaders rises by 0.025. Similarly, the local leaders with longer tenure experience are more likely to be promoted. Since the effect of tenure on turnover may be non-linear, we further

Table 3 Baseline estimation results – including both municipal party secretary and mayor

Dependent variable: turnover of municipal party secretary and mayor

	Annual GDP growth				Average GDP growth			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
growth	0.937** (0.43)	0.852 (0.53)	0.966* (0.53)	0.948* (0.53)				
wgrowth			-0.062 (0.04)					
w ¹ growth				-0.061 (0.04)				
w ² growth				0.058 (0.08)				
average growth					1.249** (0.49)	0.595 (0.69)	0.660 (0.69)	0.630 (0.69)
average wgrowth							-0.038 (0.05)	
average w ¹ growth								-0.044 (0.04)
average w ² growth								0.061 (0.11)
pred_growth		-0.951 (1.01)	-0.980 (1.00)	-1.036 (1.01)		-0.879 (1.04)	-0.897 (1.04)	-0.955 (1.04)
education		0.231*** (0.08)	0.229*** (0.08)	0.230*** (0.08)		0.228*** (0.08)	0.227*** (0.08)	0.227*** (0.08)
tenure		0.743*** (0.09)	0.743*** (0.09)	0.744*** (0.09)		0.744*** (0.09)	0.745*** (0.09)	0.745*** (0.09)
tenure-sq		-0.068*** (0.01)	-0.068*** (0.01)	-0.068*** (0.01)		-0.068*** (0.01)	-0.068*** (0.01)	-0.068*** (0.01)
age		-0.077*** (0.01)	-0.078*** (0.01)	-0.078*** (0.01)		-0.077*** (0.01)	-0.077*** (0.01)	-0.077*** (0.01)
ln(GDP)		0.186 (0.28)	0.212 (0.29)	0.213 (0.29)		0.214 (0.28)	0.226 (0.28)	0.233 (0.28)
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
pseudo R ²	0.019	0.054	0.055	0.055	0.017	0.054	0.054	0.054
ll	-3809.378	-2957.687	-2956.616	-2956.209	-4145.867	-2958.371	-2958.213	-2957.929
N	10,062	8390	8390	8390	10,822	8390	8390	8390

This table uses the turnover of municipal party secretary and mayor (0=termination, 1=same level, 2=promotion) as the dependent variable. Column (1) is a simple specification with just a measure of economic performance in the city the leaders in charge, the annual GDP growth rate. Column (2) extends column (1) to include a full set of control variables. Column (3) further extends column (2) to add a variable of geographical weighted economic growth of neighboring cities on the right-hand side, and then split it into two variables: the geographical weighted economic growth of neighboring cities in the same province and that outside the province observed in column (4). Columns (5)-(8) repeat columns (1)-(4) but instead use an alternative measure of economic performance, the average GDP growth rate. Robust standard errors are clustered by city in parentheses. *, **, and *** respectively denote significance levels at 10%, 5% and 1%

introduce the square term of tenure as an independent variable. With the square term of tenure, both tenure and the square term are significant, with negative coefficient estimates relating to the square term, which shows an inverted U-shape.⁷ Moreover, older leaders are found to be difficult to get promoted. This means that once reaching a certain age, the difficulty of promotion for local leaders unfortunately increases.

As the city-level leaders in China include both municipal party secretary and mayor, who have difference in the responsibility and authority and their promotion paths, this paper further splits the whole sample into the municipal party secretary (Table 4) and mayor (Table 5) subsample. As shown in Table 4, there is a positive and significant relationship between the turnover of municipal party secretary and their annual performance, whilst the significance levels in the case of average performance over their tenure fall, in line with Table 3. Importantly, note that when a variable of geographical weighted economic growth is included as a further control, the sign of its coefficient estimate is negative, and statistically significant at the 1% level. This evidence indicates that for the municipal party secretary, the promotion is not only determined by the absolute economic performance, but also induced by the relative performance. Further, if we separate this variable into the geographical weighted economic growth within the same province and that outside the province observed, then we can only observe that the sign of the coefficient estimate relating to the variable of geographical weighted economic growth within the same province is negative (with the value of -0.123) and statistically significant at the 1% level, whilst the coefficient relating to the latter one is insignificant. This demonstrates that the comparison of economic performance between cities mainly happens in the same province, and the economic performance of municipal party secretary within the province forms a direct competition relation, ultimately leading to local economic development. This is consistent with our another argument – the likelihood of promotion of municipal party secretary increases with their economic performance, whilst decreases with their neighboring cities' economic performance.⁸ In addition to the economic performance of neighboring cities, the average GDP growth performance of the immediate predecessor also has a negative effect on the promotion of municipal party secretary. Consistent with Chen et al. [3], the likelihood of promotion (termination) for the municipal party secretary is negatively (positively) associated with the performance of the immediate predecessor. Our results justify that the effect of relative economic performance on the likelihood of promotion for the municipal party secretary exists in both space and time levels.

As for the mayor, the significance levels related to the variables of interest decline, which shows the difference in the mechanism of promotion between mayor and municipal party secretary: a notable proportion of mayors can be promoted to the post of the municipal party secretary in the same city. This turnover is mainly related to the turnover of the party secretary, and thus economic performance seldom plays a role here.

⁷ As a robustness check, we obtain essentially identical results if we do not include the square term of tenure as a control variable.

⁸ Using the neighboring cities as peers can partially solve the challenge that the economic performances of different cities lie on different starting points, which makes the evaluation not that fair and undermines local official's motivations in pursuing economic success.

Table 4 Baseline estimation results – municipal party secretary

Dependent variable: turnover of municipal party secretary

	Annual GDP growth				Average GDP growth			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
growth	1.690*** (0.62)	1.603** (0.75)	1.787** (0.74)	1.724** (0.74)				
wgrowth			-0.111*** (0.04)					
w ¹ growth				-0.123*** (0.04)				
w ² growth				0.200 (0.13)				
average growth					1.521* (0.82)	0.569 (1.04)	0.501 (1.05)	0.349 (1.06)
average wgrowth							0.046 (0.12)	
average w ¹ growth								-0.001 (0.08)
average w ² growth								0.308 (0.19)
pred_growth		-2.864* (1.48)	-2.845* (1.48)	-3.009** (1.48)		-2.648* (1.53)	-2.650* (1.53)	-2.860* (1.53)
education		0.293** (0.13)	0.292** (0.13)	0.292** (0.13)		0.290** (0.13)	0.288** (0.13)	0.289** (0.13)
tenure		0.717*** (0.14)	0.717*** (0.14)	0.722*** (0.14)		0.718*** (0.14)	0.718*** (0.14)	0.725*** (0.14)
tenure-sq		-0.068*** (0.02)	-0.068*** (0.02)	-0.068*** (0.02)		-0.068*** (0.02)	-0.068*** (0.02)	-0.068*** (0.02)
age		-0.126*** (0.02)	-0.126*** (0.02)	-0.127*** (0.02)		-0.126*** (0.02)	-0.126*** (0.02)	-0.127*** (0.02)
ln(GDP)		1.062*** (0.41)	1.109*** (0.41)	1.090*** (0.41)		1.177*** (0.40)	1.163*** (0.40)	1.163*** (0.40)
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
pseudo R ²	0.014	0.058	0.059	0.060	0.012	0.056	0.056	0.058
ll	-1688.924	-1277.536	-1276.047	-1274.299	-1844.686	-1279.956	-1279.881	-1277.678
N	4934	4028	4028	4028	5329	4029	4029	4029

This table uses the turnover of municipal party secretary (0 = termination, 1 = same level, 2 = promotion) as the dependent variable. Column (1) is a simple specification with just a measure of economic performance in the city the leaders in charge, the annual GDP growth rate. Column (2) extends column (1) to include a full set of control variables. Column (3) further extends column (2) to add a variable of geographical weighted economic growth of neighboring cities on the right-hand side, and then split it into two variables: the geographical weighted economic growth of neighboring cities in the same province and that outside the province observed in column (4). Columns (5)–(8) repeat columns (1)–(4) but instead use an alternative measure of economic performance, the average GDP growth rate. Robust standard errors are clustered by city in parentheses. *, **, and *** respectively denote significance levels at 10%, 5% and 1%

Table 5 Baseline estimation results – mayor

Dependent variable: turnover of mayor								
	Annual GDP growth				Average GDP growth			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
growth	0.349 (0.57)	0.341 (0.75)	0.375 (0.76)	0.385 (0.76)				
wgrowth			-0.017 (0.06)					
w ¹ growth				-0.013 (0.06)				
w ² growth				-0.053 (0.11)				
average growth					1.130* (0.62)	0.678 (0.92)	0.825 (0.92)	0.867 (0.92)
average wgrowth							-0.082 (0.06)	
average w ¹ growth								-0.068 (0.06)
average w ² growth								-0.121 (0.11)
pred_growth		0.418 (1.33)	0.404 (1.33)	0.448 (1.34)		0.382 (1.36)	0.324 (1.36)	0.428 (1.37)
education		0.156 (0.10)	0.155 (0.10)	0.155 (0.10)		0.156 (0.10)	0.151 (0.10)	0.152 (0.10)
tenure		0.686*** (0.13)	0.686*** (0.13)	0.686*** (0.13)		0.684*** (0.13)	0.684*** (0.13)	0.683*** (0.13)
tenure-sq		-0.056*** (0.02)	-0.056*** (0.02)	-0.056*** (0.02)		-0.056*** (0.02)	-0.055*** (0.02)	-0.055*** (0.02)
age		-0.047*** (0.01)	-0.048*** (0.01)	-0.048*** (0.01)		-0.047*** (0.01)	-0.048*** (0.01)	-0.048*** (0.01)
ln(GDP)		-0.427 (0.37)	-0.420 (0.37)	-0.425 (0.37)		-0.473 (0.36)	-0.446 (0.36)	-0.468 (0.36)
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
pseudo R ²	0.035	0.076	0.076	0.076	0.033	0.076	0.076	0.076
ll	-2093.338	-1638.372	-1638.333	-1638.225	-2272.613	-1637.322	-1636.851	-1636.486
N	5129	4362	4362	4362	5494	4361	4361	4361

This table uses the turnover of mayor (0 = termination, 1 = same level, 2 = promotion) as the dependent variable. Column (1) is a simple specification with just a measure of economic performance in the city the leaders in charge, the annual GDP growth rate. Column (2) extends column (1) to include a full set of control variables. Column (3) further extends column (2) to add a variable of geographical weighted economic growth of neighboring cities on the right-hand side, and then split it into two variables: the geographical weighted economic growth of neighboring cities in the same province and that outside the province observed in column (4). Columns (5)-(8) repeat columns (1)-(4) but instead use an alternative measure of economic performance, the average GDP growth rate. Robust standard errors are clustered by city in parentheses. *, **, and *** respectively denote significance levels at 10%, 5% and 1%

Robustness Check

Table 6 contains the results of robustness test. Specifically, after the Third Plenary Session of the 18th CPC Central Committee, a material change in the personnel arrangement within the party arises. The evaluation of local cadres is no longer simply regarded as GDP growth, and tends to concentrate on the people's livelihood. Therefore, this table splits the sample into the pre-2013 and post-2013 subsample, and displays the finding that the promotion of municipal party secretary relates to both their own and relative economic performance before 2013, whilst this relationship changes from 2013 onward. This reflects that the reform of the CPC personnel system alters the promotion mechanism of city-level political leaders, and the dynamic effect of economic performance on the turnover appears. According to our interview and communication with the grassroots civil servants, the aspects such as environmental protection, anti-poverty, and agricultural development play an increasingly significant role in the evaluation of Chinese officials in recent years. The key indicator related to present policy orientation even has a veto over the evaluation of officials. In addition, as for the cities with different types of function, the requirement of performance evaluation differs. It no longer uses a single metric to measure all regions. The mechanism of performance evaluation becomes diversified and detailed, and we believe that this change is beneficial for an improvement in the incentive mechanism of China's officials.⁹

To examine whether the coefficients between the pre-2013 and post-2013 subsample have significant differences, we first utilize the Permutation test (columns 5 and 6 of Table 6) to examine the significance of the difference between two groups [5]. The null hypothesis is that the estimate of coefficient does not have significant difference. This method uses the Bootstrap to calculate the statistics and obtain the empirical *p*-value. The results confirm that there is a significant difference in the coefficients related to economic performance between two groups. This implies that the effect of economic performance on the promotion of municipal party secretary falls in an era of post-2013. Moreover, we also use the full sample but further include an interaction between GDP performance and a dummy of post-2013. The negative coefficient estimate for the interaction term indicates a negative relationship between GDP performance and promotion, in turn in support of our argument, though with a weak significance level.

In addition, given that the ordered logit model relies on stricter assumptions of the probability function form, we instead utilize the logit model with fixed effects as a robustness check in the last two columns of Table 6 (0 = termination or same level, 1 = promotion). In this specification, both the sign and magnitude of the coefficients of the variables of interest do not have a dramatic change, though the significance levels decline.¹⁰

⁹ While this change has yet been reflected in the government public documents, it can be further explored by scholars.

¹⁰ It is also of interest to examine whether the promotion is associated with their working experience. As a robustness check, we further include their connection, a dummy variable that equals one if the officials have been working in either provincial or central government and zero otherwise, in the empirical analysis, and obtain similar results as Table 6.

Table 6 Robustness check

	Dependent variable: turnover of municipal party secretary										
	Pre-2013		Post-2013		Permutation tests					Full sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
growth	2.649** (1.11)	2.648** (1.11)	1.284 (1.51)	1.415 (1.50)	1.365** 0.109	1.233* 0.146	2.238** (0.87)	2.157** (0.87)	2.396** (1.05)	2.237** (1.05)	
wgrowth	-0.177** (0.07)	-0.170** (0.07)	-0.286 (0.36)	-0.315 (0.34)			-0.110** (0.04)		-0.131 (0.09)		
w ¹ growth						0.146		-0.121** (0.04)		-0.143 (0.10)	
w ² growth						-0.152*		0.198 (0.13)		0.344** (0.17)	
pred_growth	-6.733** (2.97)	-6.731** (2.97)	-0.215 (2.78)	-0.278 (2.78)	-6.517**	-6.453**	-2.901** (1.48)	-3.061** (1.47)	-2.592 (1.81)	-2.797 (1.80)	
education	0.868*** (0.22)	0.868*** (0.22)	-0.309 (0.21)	-0.308 (0.21)	1.177***	1.176***	0.291** (0.13)	0.291** (0.13)	0.680*** (0.19)	0.686*** (0.19)	
tenure	1.101*** (0.26)	1.101*** (0.26)	0.638** (0.25)	0.646*** (0.25)	0.463	0.455	0.719*** (0.14)	0.724** (0.14)	1.249*** (0.19)	1.267*** (0.19)	
tenure-sq	-0.090*** (0.03)	-0.090*** (0.03)	-0.078** (0.03)	-0.079** (0.03)	-0.012	-0.011	-0.068*** (0.02)	-0.068*** (0.02)	-0.083*** (0.02)	-0.085*** (0.02)	
age	-0.182*** (0.03)	-0.182*** (0.03)	-0.086** (0.04)	-0.088** (0.04)	-0.096	-0.094	-0.126*** (0.02)	-0.127*** (0.02)	-0.097*** (0.02)	-0.099*** (0.02)	
ln(GDP)	2.076*** (0.73)	2.075*** (0.73)	0.732 (1.01)	0.679 (1.02)	1.344	1.395	1.217*** (0.44)	1.194*** (0.44)	0.565 (0.55)	0.526 (0.55)	
growth*post-2013							-1.307 (1.75)	-1.256 (1.74)			

Table 6 (continued)

		Dependent variable: turnover of municipal party secretary									
		Pre-2013			Post-2013			Permutation tests			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)		
post-2013						-1.192*					
City FE	Yes	Yes	Yes	Yes		(0.72)					
Year FE	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
pseudo R ²	0.123	0.123	0.049	0.049		Yes	Yes	Yes	Yes	Yes	Yes
ll	-486.390	-486.388	-467.720	-467.508		0.059	0.060	0.163	0.165	-979.084	
N	1758	1758	1300	1300		-1275.732	-1274.009	-981.521	-979.084	3199	3199

Columns (1)-(8) use the turnover of municipal party secretary (0 = termination, 1 = same level, 2 = promotion) as the dependent variable. Columns (1) and (2) use the same specification as columns (3) and (4) of Table 4 in the pre-2013 subsample. Columns (3) and (4) repeat columns (1) and (2) in the post-2013 subsample. Columns (5) and (6) utilize the Permutation test to investigate the significance of the difference between columns (1) and (3), and between columns (2) and (4). The values shown in columns (5) and (6) indicate the difference between coefficients. The significance is based on the method of Bootstrap (with a calculation of 1000 times) to obtain the empirical *p*-value. Columns (7) and (8) use the full sample and include an interaction term described in the text. Columns (9) and (10) utilize the logit model with fixed effects (0 = termination or same level, 1 = promotion). Robust standard errors are clustered by city in parentheses. *, **, and *** respectively denote significance levels at 10%, 5% and 1%

Heterogeneity Analysis

Table 7 and Table 8 present the heterogeneity analysis and use the same specification as column 4 of Table 4. It is natural to see whether the results vary with the level of development. We first split the sample according to the level of income. As can be observed in all cases, the probability of promotion of local leaders is positively correlated with their own economic performance. However, this positive relationship only holds to a significant degree in the group of cities with higher income level. Note that a better neighboring economic performance leads to a negative probability of promotion. Rich cities have a proportionally larger size of economy, and therefore the rates of growth are harder to maintain at a higher level. A better economic performance reflects the officials' level of management, underpinning their promotion. While poor cities have a relatively greater potential of growth, the relative economic performance among regions is a better measurement of the local leaders' level of management. Similarly, we also split the sample based on the size of the population, and the results again confirm our argument – a better personal economic performance leads to higher probability of promotion in larger cities, whilst the relative economic performance is negatively associated with the probability in smaller areas. This phenomenon also exists in the results for local leaders that are classified as belonging to science and engineering knowledge background or not. The personal performance effect shows a weak significant level in the subsample of leaders with science and engineering background, and the relative performance functions otherwise.

We also investigate the relationship across the level of government revenue, and shed light on the following findings. Cities with a lower level of revenue are naturally imbued with more support, such as tax benefits and government subsidies, in order to promote local development. The economic growth as a result of this mode of development can help the local leaders get promoted. Additionally, this relationship again holds if we explore it across the location of cities, in support of the proposed argument. For example, with higher levels of marketization in the eastern region, the measure of governance would not over-emphasize the economic performance. Instead, they are likely to apply more scientific evaluation methods to identify their capacity of governance.

Conclusion

This paper analyzes the effect of absolute and relative economic performance on the political turnover of local leaders in China, utilizing the prefectural turnover data between 2000 and 2018. We adopt the approach of the fixed effects ordered logit model to generate four main findings. First, the probability of the promotion of prefectural leaders rises with their annual economic performance. Second, the association between the probability of promotion and economic performance holds more strongly in the municipal party secretary. Such probability likewise declines with the relative economic performance (i.e., both time and space relative economic

Table 7 Heterogeneity analysis
 Dependent variable: turnover of municipal party secretary

	Income level		Population size		Knowledge background	
	Higher income level	Lower income level	Larger size of population	Smaller size of population	Science & engineering	Non-science & engineering
growth	2.518** (1.13)	1.233 (1.04)	3.068*** (1.17)	1.495 (1.00)	2.061 (2.09)	1.524* (0.81)
w ¹ growth	-0.057 (0.32)	-0.142*** (0.04)	-0.104 (0.41)	-0.133*** (0.04)	-0.060 (0.16)	-0.110*** (0.04)
w ² growth	0.116 (0.16)	0.394 (0.28)	0.045 (0.18)	0.342 (0.22)	0.941 (0.61)	0.239 (0.15)
pred_growth	-3.673* (2.03)	-3.175 (2.15)	-1.032 (2.13)	-4.525** (1.98)	0.445 (7.67)	-3.015* (1.74)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
pseudo R ²	0.063	0.086	0.078	0.068	0.199	0.059
ll	-735.774	-520.965	-671.344	-585.325	-124.577	-1003.460
N	2165	1863	2098	1930	463	3149

This table uses the turnover of municipal party secretary (0=termination, 1=same level, 2=promotion) as the dependent variable. The first part splits the sample according to the level of income. The second part splits the sample according to the size of the population. The third part splits the sample according to whether the leader has a knowledge background of science and engineering. Robust standard errors are clustered by city in parentheses. *, **, and *** respectively denote significance levels at 10%, 5% and 1%

Table 8 Heterogeneity analysis

	Dependent variable: turnover of municipal party secretary					
	Revenue as a share of GDP		Location			
	Larger government size	Smaller government size	Eastern	Interior	Western	Full sample
growth	0.531 (0.99)	3.054*** (1.08)	0.163 (1.31)	6.004*** (1.52)	1.229 (1.12)	5.277*** (1.53)
w ¹ growth	-0.055 (0.27)	-0.140*** (0.03)	0.003 (0.31)	-0.142*** (0.03)	-0.326 (0.20)	-0.132*** (0.03)
w ² growth	0.137 (0.23)	0.245 (0.16)	0.210 (0.23)	0.513** (0.24)	-0.292 (0.24)	0.155 (0.13)
pred_growth	-4.509** (1.99)	-0.451 (2.19)	-5.497** (2.58)	-3.944 (2.86)	1.413 (2.19)	-2.800* (1.48)
growth*eastern						-5.285*** (1.90)
growth*western						-3.760** (1.75)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
pseudo R ²	0.059	0.076	0.059	0.124	0.071	0.063
ll	-612.638	-651.281	-567.172	-283.219	-399.267	-1270.357
N	1970	2058	1640	1047	1341	4028

This table uses the turnover of municipal party secretary (0 = termination, 1 = same level, 2 = promotion) as the dependent variable. The first part splits the sample according to the size of government. The second part splits the sample according to the location of cities. The last column uses the full sample but adds interactions between GDP performance and the dummies of eastern and western regions. Robust standard errors are clustered by city in parentheses. *, **, and *** respectively denote significance levels at 10%, 5% and 1%

performance). Third, the absolute economic performance of the municipal party secretary plays a key role in their promotion in the cities with higher income level or larger population size, whilst in the smaller cities the peer effects contribute more. Fourth, after the Third Plenary Session of the 18th CPC Central Committee, the personnel arrangement within the party and this promotion mechanism changes.

Our results contribute to the literature in three ways. First, we sort out a panel of China's city-level data between 2000 and 2018 regarding the turnover of mayor and municipal party secretary, and provides a clear classification of their turnover based on the practical experience and interview with the insiders of government. Second, we develop the spatial econometrics model to include the geographical weighted economic performance of neighboring cities as a key explanatory variable, and observe a relative effect of economic performance. Third, we utilize the BUC estimation to examine the fixed effects ordered logit model.

Our paper also points out several further research directions. First, given a dynamic process of the evaluation of officials, we can further investigate the impact

of the factors (in either an absolute or relative way) other than economic performance (i.e., environmental protection and inequality) on the turnover of local political leaders. Second, we can also extend the relative effect found in this paper to explore the tax competition between cities within the same province. Third, despite that the annual economic performance does bite for turnover outcomes as found in this paper, we also display that the average GDP performance of the immediate predecessor has an effect on the promotion of the incumbent. Thus, we cannot neglect the impact of average performance. Due to this limitation, we can further explore why the turnover of local leaders is more sensitive to their annual performance rather than to their average performance.

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