

Does economic performance affect officials' turnover? Evidence from municipal government leaders in China

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Abstract As is well known, Chinese central government has full authority to determine the provincial and local officials' turnover. However, China has not in detail interpreted the standards of officials' promotions so far. In this paper, the latest database of city-level leaders for the period between 2002 and 2013 is utilized to investigate the influences of economic performance on party secretaries' odds of being promoted. The estimation results by a panel multinomial logit method indicate that municipal annual GDP per capita is significantly positively associated with leaders' chances of promotion. Specifically, the average GDP growth rates during leaders' tenures have much higher effects. Moreover, some important factors of leaders' personal characteristics also affect the political turnover.

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For instance, party secretaries' connection with China's Communist Youth League, political experience, educational level and professional expertise all have positive impacts on their chances of obtaining a promotion. In contrast, leaders' ages and tenures are found to be negatively related to their promotion possibilities.

Keywords Economic performance · Political turnover · Municipal government leaders · Panel multinomial logit model · China

JEL Classification C35 · O53 · H11

1 Introduction

The achievement of the Chinese government of maintaining rapid economic development over the past three decades is significant. So far, a growing body of literature has tried to explore the reasons for China's remarkable economic performance. Generally speaking, the existing literature focuses on the conventional input factors including non-exhaustive labor supply (Choudhry and Elhorst 2010), excessive accumulation of physical capital (Chow 1993; Chow and Li 2002) and human capital (Wang and Yao 2003), technology progress (Wu 2000), and the benefits and bonuses gained from institutional reform and innovation (Tyers 2014; Sun et al. 2017). However, until very recently, there have been very few studies paying close attention to the contributions of local government officials to China's regional economic growth. The only exceptions are Li and Zhou (2005) and Xu and Wang (2010), who focus on the provincial cases in China.

As is well known, local governance in China has significant Chinese features. For instance, the Communist Party of China (CPC) is the ruling party of China and is responsible for affairs of both party and politics. Although fiscal decentralization and even to some extent administrative decentralization have been suggested since the beginning of reform and opening-up in the late 1970s, the Chinese central government still has the absolute authority to determine the appointment and dismissal of local officials (Xu 2011).¹ As a result, to fully understand the impacts of local government officials on regional economic development, the Chinese features of local governance should be kept in mind and considered.

In this regard, it is meaningful and important to gauge the influences of local government, particularly the local officials, on China's economic development. However, the effects of leaders on economic development have been largely ignored and have not been quantitatively investigated until recently. For example, from the micro perspective, Bertrand and Schoar (2003) conducted an empirical analysis using a manager-firm matched panel dataset of the 800 largest U.S. firms from 1969 to 1999 and found that managers' styles and strategies would significantly influence the corporate performance. From the macro perspective, using an international dataset covering 130 countries during the period, Jones and Olken (2005) first investigated whether and how much the changes in the

¹ The term "administration decentralization" here refers to the redistribution of decision making authority and financial and management responsibilities among different levels of sub-central government. During the reform era, China's central government had gradually transferred some authority and political power to provinces and lower-level government, and allowed them to make some decisions or even launch new reforms that are important to local economic development. Some scholars argued that China's administration decentralization, although not thoroughly, contributed significant to China's phenomenal economic performance since the reform and opening-up started in 1970 s (e.g., Montinola et al. 1995; Jin et al. 2005; Cai and Treisman 2006).

national government leaders may affect the economic performance of the country. In China's context, Li and Zhou (2005) and Xu and Wang (2010) have also found that the incentives of promotion for and the competitions among the provincial government officials may have significant impacts on provincial economic performance, although the estimated sizes and even the directions of the influences are quite different for the two research studies.

Economic accountability did not play so important role as today in the officials' turnover before the reform and opening-up launched in late 1970s. At that time, to be politically correct and reliable is more important for provincial and local officials (Guo 2007). During the reform era, as the ruling CPC claimed that the working focus was shifted from class struggle to economic construction in the Third Plenary Session of the 11th Central Committee of the Communist at the end of 1978, the economic performance has become growingly important in the determination of provincial officials' turnover (Bo 2002; Li and Zhou 2005). This was especially the case after then de facto leader Deng Xiaoping claimed that CPC would promote the cadres who are "younger, better educated, and professionally competent" (MacFarquhar 2011). According to this standard, it is generally believed that being "professionally competent" means being able to enhance local economic development.

Given that Chinese local officials usually care much about local economic development, another important and interesting question emerges: why are Chinese local government officials so keen on local economic growth? The answer to this question is fundamentally important because it involves the incentive mechanism that could effectively spur economic growth. To some extent, the answer to this question is also a key to comprehend China's extraordinary economic development over the past decades. Because the incentive mechanism is crucial to economic growth, other developing countries could also learn from China's experience.

So far, there have been some research studies on the issue of the impacts of the incentive mechanism on economic development in China. The extant literature explores this topic in the following two aspects. On the one hand, some researchers investigate how local officials make decisions on economic affairs from the perspective of financial incentives, as fiscal decentralization provided sufficient incentives to local officials (Montinola et al. 1995; Qian and Weingast 1997; Qian and Roland 1998; Jin et al. 2005). On the other hand, scholars also conducted studies regarding political incentives as the most important motivation for local officials to boost economic growth (Maskin et al. 2000; Blanchard and Shleifer 2001; Li and Zhou 2005; Bardhan 2006) because the central government has the tendency to promote officials who have better economic performance. Generally speaking, it is believed and sometimes documented that since the late 1970s, when China's economy started to take off, the leaders of the government in those cities or counties were frequently promoted to higher-level positions while they achieved remarkable economic performance, particularly the positions of the underdeveloped provinces. Such chances of promotion due to good economic performance provide powerful incentives for local leaders to try their best to boost regional economic growth (Xu 2011).

To examine the incentive mechanism on China's economic development quantitatively, there have been some research studies conducted on the determinants of local officials' promotion, including Bo (2002), Landry (2003), Li and Zhou (2005), Guo (2007), Opper et al. (2015), and Wu and Chen (2016). Among these studies, Li and Zhou (2005) as well as Wu and Chen (2016) found that economic performance, particularly GDP growth rate, was one of the key criteria for the central authority to promote local officials in the 1980s and 1990s. In contrast, Bo (2002) and Guo (2007) proposed that the increase in financial

income plays a more important role in determining local officials' promotion. Interestingly, some recent studies have contrary findings and claimed that economic performance is not a significant reason that could explain the turnover of local officials. For instance, Landry (2003) found that the achievement in economic development is not closely related to local officials' promotion. Moreover, using a dataset covering China's provincial leaders for the period between 1979 and 2011, Oppen et al. (2015) found that Chinese high-level elites place more weight on homophonous associations rather than economic performance when deciding to recruit middle-level elites to the top positions of state.

Although the extant literature has made some primary efforts to estimate the influences of local officials' economic performance on their promotion chances, there are still some defects remaining in previous studies. First, most of the previous studies focused on government officials at the provincial level, such as Li and Zhou (2005), Oppen et al. (2015) and Wu and Chen (2016). However, given China's political reality, and considering the fact that the differences in economic development in the individual provinces are remarkable, it is more likely that the turnover of the provincial officials may be affected by a series of comprehensive indicators rather than a single indicator such as the GDP growth rate of a certain province. Second, for the majority of previous studies, the sample period of the data utilized is usually before 2000. However, given that many features of China's economic development and political ecology have changed dramatically in the new millennium, the relationship between local officials' promotion possibility and the regional economic performance might have been quite different in recent years.

In this regard, the main contribution of this study is threefold. First, this is so far the first study that focuses on municipal officials and makes initial efforts to investigate whether and how the economic performance would affect the possibility that the city-level officials are promoted or terminated. Second, this study utilizes the latest dataset that covers 113 Chinese cities for the period 2002–2013. Third, the proper panel data analysis tools are utilized to fully make use of the information the dataset contains, and the estimation results by employing the panel conditional logit model enable us to gauge the accurate chance an official may have of being promoted under the circumstances of achieving certain economic and social development. Specifically, the Multinomial Logistic Regression Estimations also help us to gauge whether the chances of promotion are higher than all of the other turnover possibilities, including being replaced, terminated and moved to a position of the same level.

The rest of this paper is organized as follows. Section 2 introduces the empirical methodology utilized in this research. Section 3 briefly discusses the data and variables used in the empirical study. In Sect. 4, the estimation results are given and discussed. Finally, the last section concludes the paper.

2 Empirical methodology

In this study, we are concerned about whether and how the economic performance and other indicators of social and economic development would affect the chance of the municipal government officials to be promoted. As a result, the values of the dependent variable are limited. Specifically, 0 is assigned to the dependent variable if the official is not promoted, while 1 is assigned as the official gets promoted. Due to the nature of the limited dependent variable, the observations of the dependent variable are 0 (not being promoted) or 1 (being promoted) instead of continuous data, the conventional OLS

estimators may yield biased estimation results. This is because one of the vital conditions for unbiased estimations of OLS that the residual term has the same variance given any value of the explanatory variables could not be met (Wooldridge 2016). Furthermore, the relationship between the dependent variable and explanatory variable is probably nonlinear as OLS estimator requires. As a result, in this study, the panel multinomial logit approach and conditional logit approach with fixed effects are employed.²

Specifically, the benchmark regression equation is as follows:

$$Promotion_{it} = \alpha + \beta_1 Growth_{it-1} + \beta_2 X_{it-1} + \eta_i + \epsilon_{it} \quad (1)$$

where the dependent variable *Promotion* is a discrete variable that measures whether the official is promoted. Growth is the key explanatory variable that measures municipal economic performance. Not being promoted is defined as the baseline category. β_j is a vector of coefficients of each of the independent variable *X*, which is estimated by maximizing a log likelihood function. The stochastic term ϵ_{ij} has the independent and Weibull distribution, and η_i is an individual-specific, time-invariant effect. The multinomial logit model can be expressed as follows:

$$P_{ij} = \exp(\beta'_j X_{ij}) / \sum \exp(\beta'_j X_{ij}) \quad (2)$$

The multinomial logit regression is the most suitable model in a discrete choice analysis in the presence of more than two alternatives in a choice set. The multinomial logit model is employed to examine the relationship between a categorical response variable, with more than two categories and a set of explanatory variables (So and Kuhfeld 1995). It is originally derived from the theory of maximum random utility, which states that a government implements an exchange rate regime that maximizes its utility in the exchange rate regime selection. An important assumption of the multinomial logit model is that it implies that the decision between two different sets of alternatives is independent from the presence of more alternatives. Furthermore, it provides useful information for determining the correct type of model to estimate multinomial logit equations. In recent years, the multinomial logit regression technique has been broadly used. For instance, Wei et al. (2005) employed a multinomial logit model to investigate the entry modes of foreign direct investment in China.

We also estimate our model employing conditional (fixed effects) logit. In the case of binary choice variables with panel data, we observe:

$$\begin{aligned} y_{it} &= 1 \quad \text{if } y_{it}^* > 0 \\ y_{it} &= 0 \quad \text{if } y_{it}^* \leq 0 \end{aligned} \quad (3)$$

where $y_{it}^* = \mu_i + X'_{it}\beta + \epsilon_{it}$. This function can be interpreted as the party secretary is promoted dependent on the set of observed variables (*X*), unobserved individual (city) characteristics (μ) and a random error term (ϵ). The probability that we observe a promotion is:

$$P(y_{it} = 1) = P(y_{it}^* > 0) = P(\epsilon_{it} > -\mu_i - x'_{it}\beta) = F(\mu_i + x'_{it}\beta) \quad (4)$$

² The fixed-effects model calculates means for each variable and then subtracts the means; the constant and individual effects are also eliminated by this transformation eliminating unobserved heterogeneity by taking deviations from individual mean periods.

For overcoming the problem of incidental parameters, because the number of parameters increases with the number of cities in a fixed effects model, Chamberlain (1980) proposes a conditional logit estimation to condition the likelihood function on a minimal sufficient statistic for the fixed effects, which we can write as follows:

$$L = \prod_{i=1}^N P\left(y_{i1}, \dots, y_{iT} \mid \sum_{t=1}^T y_{it}\right) \quad (5)$$

The probability of the observed promotion of the party secretary no longer depends on the fixed effects; therefore, the coefficients of our interested variables would be estimated consistently under the conditional logit estimator.³

3 Data

In this study, we focus on the municipal party secretaries as the main targets of interest. Because CPC is the sole ruling party in China, the top position at the city level is the party secretary of the city, followed immediately by the mayor. Li and Zhou (2005) utilized the data of provincial party secretaries and found that the GDP growth rate of a certain province is a good indicator to forecast his or her chance of being promoted. Opper et al. (2015) suggest that the research idea of Li and Zhou (2005) could be applied to a city-level dataset. The data for Chinese city-level party secretaries of CPC between 2002 and 2013 were collected. Specifically, we determine whether the official is in office by checking their terms of service: if there is a turnover of party secretaries in one city, then the officials with a service term longer than 6 months are treated as being in office; if there is no turnover of party secretaries in one city and neither of the top officials' service terms is longer than 6 months, the official with the longest service term is chosen as the governor being in office that year. This rule applies to both city party secretaries and mayors. However, because the authority of a city party secretary is higher than that of a mayor, we focus on city party secretaries as the main research targets.

Because the main purpose of this study is to investigate the importance of economic performance on a city-level municipal party secretary's promotion possibility, the main independent variable is municipal annual GDP growth rate, as GDP growth rate has long been considered as the key indicator for economic performance in China (Li et al. 2016). Because the purpose of this study is to investigate the relationship between economic performance and the officials' turnover, the economic achievement under the governance of the corresponding officials is the most important economic indicator. As such, the annual GDP growth rate is utilized as the benchmark key explanatory variable. To check the robustness of the estimation, the 5-year moving average GDP growth rate during the official's tenure is utilized in the sensitivity analysis. As Li and Zhou (2005) stressed, the moving average GDP growth rate is a less noisy signal compared with the annual growth rate.

Following extant literature, we have also considered some other important factors that may affect official's turnover, including personal characteristics such as professional experience, personal credentials and educational level as well as key features of the cities such as total population. Concretely, the other independent variables utilized could be summarized as follows.

³ The variables that hardly vary over time should thus be excluded from the model (Mierau et al. 2007).

CCYL As Opper et al. (2015) noted, it is difficult to capture the existence and effect of personal ties—the *recruitment networks*. As a result, some indirect measures should be utilized to capture the potential network ties. Following Opper et al. (2015), a dichotomous variable is introduced to indicate whether the official has ever been a member of China's Communist Youth League (CCYL). To some extent, the variable of *CCYL* could be considered as an “old-boys network” and traditionally constitutes a recruitment pool for the party and government leadership (Bo 2004; Li 2006).

Tenure Li and Zhou (2005) found that officials' tenure may also affect their possibility of being promoted. In this study, tenure is defined as a continuous variable that indicates the number of years a municipal leader has served on the current position. Generally speaking, long office terms are associated with a certain sense of local favoritism. However, a longer tenure also means a lack of general, countrywide professional experience, which may disqualify one from higher central government positions. As a result, the effect of tenure on an official's change in being promoted needs further investigation.

Experience The experiences of party secretaries may also affect the central authority's decision of cadre assignment (Guo 2007). In general, more experience at the grass-roots level and sublevel government may benefit an official in the promoted position. In this regard, experience is defined as a dichotomous variable that measures whether the municipal leader has acquired any professional experience in the principal or deputy secretary-general office director because these positions may help the officials gain necessary experience and have more access to higher-level officials that could both sufficiently increase their chances to be promoted. The variable of “Experience” is assigned to be 1 if the municipal party secretaries have acquired any professional experience in the principal or deputy secretary-general office director; otherwise, “Experience” is assigned to be 0.

Education Higher education became crucial since China's promulgation of a socialist market economy in August 1992. Meritocracy was revitalized as a source of elite legitimacy during the reform period. In recent years, a growing number of local leaders have higher education, and some even earned doctoral degrees. Following Li and Zhou (2005), to capture education effects, a dummy variable is introduced to measure the official's education level. The variable *Education* indicates 1 if party secretaries actually hold a University degree and 0 otherwise.

Expertise As of 1980, Chinese leader Deng Xiaoping had already suggested that the contingent of cadres should become more revolutionary, better-educated, more professional, competent and younger. Since then, professional expertise has become gradually increasingly important for Chinese government leaders. As Li and Bachman (1989) and Shambaugh (2001) noted, expertise in the fields of engineering, law, economics and business administration became prerequisites for political careers. In this study, the variable *Expertise* is defined as follows: if the official has a degree in engineering, law, economics or business administration, *Expertise* = 1; otherwise, *Expertise* = 0.

Age As claimed by Li and Zhou (2005) and Opper et al. (2015), age is also an important factor that may influence officials' political career; in particular, the CPC began to move younger cadres to leading posts in the 1980s. As such, officials' age is also introduced as an independent variable. Because the CPC has set strict rules on the retirement age of cadres, particularly high-profile leaders, generally speaking, younger municipal party secretaries are more likely to be promoted when all of the other conditions are equal.

Population Moreover, some features of the cities that the officials work in may also affect their possibilities of being promoted. For instance, it is typically more difficult for leaders to achieve significant goals of economic development in larger cities with more

population and lower levels of economic development. As a result, the size (measured with logarithmic population) of different cities is also controlled for in this study.

All data utilized in this study are collected from different datasets. Concretely, the municipal party secretaries' turnover data for the period of 2002–2010 are extracted directly from the database of Chen (2015), and the data for the last three years are collected by the authors from the database of Chinese municipal leaders following Chen (2015).⁴ Altogether, there are 113 cities in the database, of which 52 cities are located in the East, 31 in the Center and the other 30 in the West. The full list of these cities and their locations are presented in Table 8 in the appendix. The data for the independent variables are obtained from or calculated on the basis of the statistics from the *China City Statistical Yearbooks* and *China Statistical Yearbooks* of various years. To sum up, the descriptive statistics are presented in Table 1.

Table 1 provides the data definitions as well as a summary of the descriptive statistics for the variables utilized in this study. It is shown in Table 1 that the mean of *Promotion* is 0.235 in our sample, and the means of annual GDP growth rate and moving average GDP growth rate during a party secretary's tenure are 9.93 and 8.41%, respectively, reflecting the remarkable economic growth for our sample period. In addition, the mean of *Tenure* is 2.86, indicating that most of the party secretaries have terms in office of less than 3 years. Moreover, the mean value of *Age* is approximately 57, and the youngest party secretary is 48 years old. These statistics suggest that the city governor is a senior position and that the municipal party secretaries are relatively older in our sample. The average of *Education* is 0.941, which reveals the fact that the vast majority of party secretaries have already earned college degrees during our sample period.

4 Estimation results and discussion

The estimation results of the empirical study are reported in Tables 1, 2, 3, 4, 5, and 6. Table 2 represents the basic estimation results with the situation where a municipal party secretary is promoted as the dependent variable and the municipal annual GDP growth rate is the key explanatory variable.

4.1 Basic estimation results

At first, we consider the impacts of municipal annual GDP growth rate on the chances of party secretaries being promoted to higher level positions. In all four models presented in Table 2, the coefficients of annual GDP growth rate are significantly positive, indicating that the economic performance indeed has significantly positive influences on party secretaries' political careers. Moreover, according to the panel conditional logit regression model, it is possible to calculate the marginal increase in the possibility of being promoted once the annual GDP growth rate is increased by one percentage point. Concretely, based on the estimation results shown in Table 2, as the estimated coefficients are in the range of 0.014–0.047, the increase in the odds of being promoted for the party secretary is between 1.4 and 4.8% if the municipal annual GDP growth rate could be further enhanced by one percentage point, other things being equal.⁵

⁴ For more information on the database, please refer to <http://www.hotelaah.com/liren/index.html>.

⁵ For the logit model, if the coefficient of one explanatory variable is estimated to be β , the increase in the odds for the dependent variable to be 1 is $\exp(\beta) - 1$ once there is a marginal increase in the value of the explanatory variable. For more details, refer to Wooldridge (2016).

Table 1 Descriptive statistics and definitions of the variables used in this study

Variable	Definition (unit)	Obs	Mean	S. D.	Min	Max
Promotion	Whether the municipal leader is promoted (0 = not promoted; 1 = promoted)	1351	0.235	0.424	0	1
Annual GDP growth rate	Municipal annual GDP growth rate (%)	1355	9.934	0.977	0.413	11.717
Average GDP growth rate	Average municipal annual GDP growth rate during the municipal leader's tenure (%)	1335	8.412	1.325	0.258	9.365
CCYL	Whether the municipal leader has ever been a member of China's Communist Youth League (0 = no; 1 = yes)	1339	0.488	0.500	0	1
Tenure	The length of the municipal leader's tenure (years)	1353	2.860	1.809	1	11
Experience	Whether the municipal leader has acquired any professional experience in the principal or deputy secretary-general office director (0 = no; 1 = yes)	1339	0.488	0.500	0	1
Age	The age of the municipal leader (years)	1352	56.999	5.031	48	67
Education	Whether municipal leader actually holds a degree in higher education (0 = no; 1 = yes)	1335	0.941	0.236	0	1
Expertise	Whether the municipal leader had a degree in engineering, law, economics or business administration (0 = no; 1 = yes)	1351	0.235	0.424	0	1
Population	Total population of the city (1000 persons)	1350	509.363	384.057	29	3358.4

As anticipated, the basic estimation results reveal the fact that for the sample period between 2002 and 2013, GDP growth rate is still one of the key indicators to evaluate the competence of municipal leaders. Under these circumstances, municipal party secretaries may have strong motivations to spur local economic growth to obtain greater chances to be promoted. These findings are basically consistent with previous studies of Li and Zhou (2005), Oppen et al. (2015) and Wu and Chen (2016), although Oppen et al. (2015) reported that the effects are not significant in their findings.

Moreover, it is also interesting to investigate the estimation results for the other explanatory variables. The variables under the category "personal characteristics" have quite different estimated coefficients, suggesting that their influences on party secretaries' chances of being promoted vary remarkably. Specifically, the coefficients of the variable *CCYL* turn out to be positive and significant in two of three models, indicating that the relationship with China's Communist Youth League could remarkably boost the odds of being promoted. In fact, according to the estimated coefficients, the increase in the chances of getting promoted could be as high as 11–25% for the municipal leaders who have previously joined the *CCYL* compared to those who have not. This finding suggests that the political relationship with CPC's allied organization has a potential benefit for the promotion of a municipal leader. These results are broadly in line with Oppen et al. (2015).

Table 2 Conditional logit regression of economic performance on the promotion of municipal party secretaries

Model	(1)	(2)	(3)	(4)
<i>Economic performance</i>				
Annual GDP growth rate	0.035** (0.021)	0.047** (0.031)	0.014* (0.062)	0.029** (0.034)
<i>Personal characteristics</i>				
CCYL	0.103** (0.003)		0.031 (0.175)	0.223** (0.006)
Tenure	-0.716** (0.021)		-0.556** (0.031)	-0.235* (0.061)
Experience	0.103 (0.313)		0.214* (0.069)	0.036 (0.610)
Age		-0.033 (0.646)		-0.477** (0.020)
Education		0.069 (0.630)		0.108** (0.025)
Expertise		0.541** (0.000)		0.334 (0.172)
<i>Control variables</i>				
Log population			0.316** (0.039)	0.011 (0.112)
Observation	1356	1356	1356	1356
Log likelihood	-1027.902	-989.889	-1191.065	-1147.007
P-Hausman test	0.000	0.000	0.000	0.000

P values in parentheses. The significance levels of 5% and 10% are noted by ** and *, respectively

By contrast, the length of tenure tends to have negative impacts on party secretaries' promotion chances. According to the estimation results, another year in office may on average decrease the leader's possibilities of being promoted between 21 and 51%. It is noteworthy that the previous studies had rather controversial conclusions on this topic. Li and Zhou (2005) found similar results using the database of provincial government leaders, while Opper and Brehm (2007) found that the length of tenure is positively related to provincial leaders' promotion chances. Guo (2007) even reported a nonlinear relationship between the two. As for the variable *Experience*, the estimation results indicate that its impacts on the possibility of getting promoted are positive but statistically insignificant (the coefficient of *Experience* in model (3) is merely marginally significant). These results indicate that the party secretaries' professional experience as the principal or deputy secretary-general office director may somehow increase the possibility of being promoted, but such experience is not the decisive factor.

In contrast, as for the other variables of personal characteristics, *Education* and *Expertise* have positive influences on the party secretaries' possibilities of being promoted, while *Age* presents negative impacts on party secretaries' promotion chances. These estimation results are generally similar to the expectations and previous studies such as Li and Zhou (2005) and Opper et al. (2015). The results also to some extent reveal the fact that in recent years, the CPC indeed has become more willing to assign cadres with higher education, professional expertise and younger age to higher leading positions as claimed.

Table 3 Sensitivity tests: weights for average economic performance

Model	(1)	(2)	(3)	(4)
<i>Economic performance</i>				
Average GDP growth rate	0.409** (0.011)	0.586** (0.013)	0.488** (0.031)	0.798** (0.042)
<i>Personal characteristics</i>				
CCYL	0.113** (0.019)		0.063** (0.045)	0.047* (0.086)
Tenure	-0.019** (0.043)		-0.021** (0.021)	-0.019* (0.076)
Experience	0.076 (0.654)		0.416** (0.019)	0.077* (0.056)
Age		-0.022 (0.787)		-0.287** (0.032)
Education		0.288** (0.025)		0.724** (0.044)
Expertise		0.076** (0.018)		0.054 (0.222)
<i>Control variables</i>				
Log population			0.097* (0.056)	0.173* (0.078)
Observation	1356	1356	1356	1356
Log likelihood	-1028.381	-990.652	-1191.935	-1148.114
P-Hausman test	0.000	0.000	0.000	0.000

Finally, to control for the size of the city, population in logarithmic form is also introduced as a control variable. Its estimated coefficients in both models (3) and (4) are positive, indicating that the party secretaries in larger cities with more population might have better chances of being promoted. The coefficient of city population in model (4) is statistically insignificant, suggesting that such influences may not be significant. The reason for the positive impacts of city size as population on party secretaries' possibilities of being promoted might be that because in general, the city management of a larger city is more difficult, the leaders that gain average economic achievements could demonstrate their ability for good city management. As a result, the leaders of larger cities are more likely to be promoted, all other conditions being equal.

4.2 Sensitivity analysis

To check the robustness of the estimation results, we have also performed a sensitivity analysis by utilizing different forms of regression specifications and/or using different explanatory variables. The estimation results for the sensitivity analysis are shown in Tables 3, 4, 5, and 6.

The estimation results of the sensitivity analysis will be interpreted step by step. First, in Table 3, the 5-year moving average GDP growth rate during party secretaries' tenure is utilized to replace annual GDP growth rate as the key explanatory variable. The main reason for taking moving average GDP growth rate is to reduce the impacts of time varying

Table 4 Sensitivity tests: a stylized multiregional

Model	Eastern		Central		Western	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Economic performance</i>						
Annual GDP growth rate	0.018 (0.145)		0.046* (0.069)		0.027** (0.013)	
Average GDP growth rate		0.016 (0.103)		0.718** (0.043)		0.801** (0.015)
<i>Personal characteristics</i>						
CCYL	0.039* (0.053)	0.017* (0.072)	0.039** (0.036)	0.014* (0.083)	0.011* (0.098)	0.002 (0.232)
Tenure	0.034 (0.314)	-0.081** (0.023)	-0.033 (0.646)	-0.036** (0.032)	0.054 (0.121)	-0.022** (0.043)
Experience	0.035** (0.029)	0.293** (0.043)	0.069* (0.065)	0.044 (0.523)	0.184** (0.013)	0.022 (0.603)
Age	-0.036 (0.610)	-0.535** (0.015)	-0.541** (0.023)	-0.039 (0.778)	-0.034** (0.012)	-0.322** (0.002)
Education	0.047 (0.737)	0.021 (0.574)	0.387* (0.052)	0.474** (0.015)	-0.031 (0.975)	0.125** (0.046)
Expertise	-0.477** (0.017)	-0.016** (0.037)	0.002* (0.084)	0.008** (0.041)	0.016** (0.045)	0.074 (0.269)
<i>Control variables</i>						
Log population	0.628* (0.071)	0.321 (0.313)	0.731* (0.088)	-0.322 (0.292)	0.342 (0.300)	-0.309 (0.574)
Observation	624	624	372	372	360	360
Log likelihood	-361.544	-357.263	-481.173	-480.331	-387.009	-392.092
P-Hausman test	0.000	0.000	0.000	0.000	0.000	0.000

so that we can focus on the economic performance of a specific secretary. Generally speaking, the estimation results are similar to those shown in Table 2. It is noteworthy that the coefficients of average GDP growth rate are much larger in magnitude than those of annual GDP growth rate reported in Table 2, indicating that the economic performance during a leader's tenure is far more important than the general economic performance to his future political career. Literally speaking, an increase in average GDP growth rate of one percentage point during the service term could significantly push up the municipal leader's odds of being promoted by as much as 51–122%. The astonishing improvement of the odds implies the fundamental importance of good economic performance during the tenure for a municipal leader. These results, again, are consistent with Li and Zhou's (2005) findings for Chinese provincial leaders.

Given the considerable disparity of economic and social development across regions in China, and considering the heterogeneous problems in our samples (Jang and Chang 2014), it is also interesting and important to investigate whether the influences of economic performance on the chances of being promoted differ among cities in different regions. In this regard, we also conduct the same analyses shown in Tables 1 and 2 for the three

Table 5 Sensitivity tests: Nonlinearity in the effect of tenure

Model	(1)	(2)	(3)	(4)
<i>Economic performance</i>				
Annual GDP growth rate	0.072** (0.032)	–	0.045** (0.007)	
Average GDP growth rate		0.376** (0.011)		0.294** (0.009)
<i>Personal characteristics</i>				
CCYL	0.609** (0.034)	0.309** (0.006)	0.466* (0.053)	0.110 (0.398)
Tenure	–0.409* (0.056)	–0.339* (0.088)	–0.023** (0.031)	–0.433* (0.076)
Tenure squared	0.767** (0.002)	0.109* (0.083)	0.005 (0.673)	0.434* (0.076)
Tenure cubic	0.071 (0.439)	0.034 (0.934)	0.012 (0.284)	0.187* (0.053)
Experience	0.033 (0.602)	0.212 (0.603)	–0.064 (0.908)	0.005 (0.283)
Age		–0.102** (0.009)		–0.237** (0.021)
Education		0.176 (0.834)		0.309* (0.062)
Expertise		0.702** (0.045)		–0.034 (0.530)
<i>Control variables</i>				
Log population	0.097* (0.071)	0.232 (0.239)	0.098** (0.040)	0.299 (0.509)
Observation	1356	1356	1356	1356
Log likelihood	–700.420	–634.304	–934.309	–855.231
P-Hausman test	0.000	0.000	0.000	0.000

different regions (east, center and west).⁶ As shown in Table 4, the relationship between economic performance and party secretaries' possibilities of being promoted varies remarkably across different regions. Although the influences are positive for all three regions, the coefficients for the eastern cities are smallest and statistically insignificant. The magnitude and the significance of the coefficients for the central and western cities are quite similar.

These estimation results indicate that the influences of economic performance on the political turnover for the municipal leaders in the East are weak and not obvious. One possible reason for this finding is that China's eastern region is most prosperous and most advanced in economic and social development; therefore, it is more difficult for the

⁶ In this paper, the classification of eastern, central and western regions is in accordance with the guidelines of the National Bureau of Statistics of China (NBS). Specifically, the eastern region includes Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Liaoning, Guangdong, Guangxi and Hainan; the central region contains Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei and Hunan; and the western region includes Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Ningxia, Qinghai and Xinjiang. The geological location of a city depends on the location of the province it is in.

Table 6 Sensitivity tests: municipal leader is an “Economist”

Model	(1)	(2)	(3)	(4)
<i>Economic performance</i>				
Annual GDP growth rate	0.032** (0.045)		0.011** (0.034)	
Average GDP growth rate		0.872** (0.021)		0.324* (0.061)
<i>Personal characteristics</i>				
CCYL	0.934** (0.023)		0.322** (0.045)	0.039 (0.843)
Tenure	-0.176 (0.615)		-0.336** (0.046)	-0.551** (0.018)
Experience	0.042 (0.232)		0.057* (0.098)	0.056 (0.889)
Age		-0.022** (0.008)		-0.081** (0.024)
Education		0.022 (0.603)		0.240** (0.013)
Expertise		0.232 (0.702)		0.106** (0.034)
<i>Control variables</i>				
Log population			0.538** (0.012)	0.137 (0.607)
Observation	250	250	250	250
Log likelihood	-362.509	-358.327	-474.292	-472.646
P-Hausman test	0.000	0.000	0.000	0.000

municipal leaders in the eastern region to maintain extraordinarily rapid economic growth. After all, according to the basic economic rules of convergence, the economic growth rates in the less developed central and western regions of China tend to be higher than those in the rich eastern region (Weeks and Yudong Yao 2003). By this token, the municipal leaders of eastern cities may not have such strong incentives to boost local economic growth compared with their counterparts in the central and western regions.

Because the impacts of tenure on the odds of political leaders to be promoted were estimated to be rather controversial in the extant literature (Li and Zhou 2005; Guo 2007; Opper et al. 2015), we also examine whether the relationship between leader’s tenure length and his or her chances of being promoted is nonlinear. To achieve this goal, we introduce tenure and its squared and cubic terms in the specification at the same time. As shown in Table 5, the coefficients of Tenure, its squared term and cubic term are estimated to be negative, positive and positive, respectively. As a result, the relationship between tenure and a leader’s promotion possibility is literally “N” shaped.

Currently, the CPC tends to promote officials with professional experiences in economics, so the officials could formulate better policies appropriately to stimulate local economic development. As such, we also examine the odds of being promoted for the officials who are “economists”. “Economist (*Jingjishi*)” is an academic title in China. The title of “economist” could be obtained after qualifying in the economic professional qualification examination, and the certificates of competency are issued by the Ministry of Personnel. The economic professional qualification examination institutes a system of

uniform national examination for the qualification as an economist, which is composed of the national unified organization, outline, examination question, and grading standard. Moreover, this examination sets two levels: senior economist and intermediate economist. In general, municipal leaders with the title of “economist” have a higher ability of economic competence and are therefore expected to perform well in economic development. Hence, it is expected that the leaders who are “economists” are more likely to be promoted. According to the estimation results shown in Table 6, when the party secretary is an “economist”, the economic performance is still an important positive influential factor on his or her promotion, and the effects of higher GDP growth rate on his or her chances of being promoted are similar to leaders without the title of “economist”. Therefore, to be an “economist” does not sufficiently increase the possibility of a municipal party secretary being promoted compared with their counterparts without the title when their economic performances are similar. For the other estimated results of explanatory variables, similar findings are offered compared with the findings from the basic regression results. Furthermore, the *P* values for the P-Hausman tests in Tables 2, 3, 4, 5, and 6 are substantially small, suggesting that the FE estimator is preferred to the RE estimator when the logit estimations are conducted. This is partly because that some cross-sectional (provincial) time-invariant factors that may affect the officials' turnover (e.g., residential living habits, geographical location, and climate) should be controlled for in the estimations.

4.3 The multinomial logistic regression

Finally, we utilize different settings of the dependent variable to check whether the estimation results may be sufficiently changed. In all previous estimations, the dependent variable is a binary variable, of which the value is 0 if the municipal leader is not promoted and 1 if the leader is promoted. To further investigate whether the different situations of no promotion may affect the results, we examine three statuses of the municipal leaders who are not promoted: replaced, terminated or moved to a position of the same level. The dependent variable is a categorical variable that takes the value of 1 if a municipal party secretary is replaced, 2 if terminated, 3 if shifted to a same-level position and 4 if promoted.

According to the estimation results depicted in Table 7, the chances of promotion are higher than any of the other possibilities. The two key explanatory variables of “Annual GDP growth rate” and “Average GDP growth rate” have positive and statistically significant coefficients in all regression specifications, providing evidence that better economic performance helps party secretaries indeed increase the likelihood of promotion and reduces the likelihood of being replaced, terminated or moved to a different position of the same level. Moreover, on the basis of the estimation results, when the moving average GDP growth rate is utilized as the key explanatory variable, it could be observed that the odds of promotion compared with the possibilities of being terminated are highest ($p = 7.68\%$), while the chances of promotion compared with that of being replaced are lowest ($p = 4.08\%$). As a result, the estimation results are quite robust.

5 Concluding remarks

In this paper, we utilize the latest dataset for the period of 2002–2013 to examine the impacts of economic performance on Chinese party secretaries' odds of being promoted. Considering the fact that the dependent variable could only have discrete limited values,

Table 7 Multinomial logistic regression estimates: full sample

Model	(1) Promoted/replaced	(2) Promoted/terminated	(3) Promoted/same level	(4) Promoted/replaced	(5) Promoted/terminated	(6) Promoted/same level
<i>Economic performance</i>						
Annual GDP growth rate	0.074** (0.004)	0.059** (0.016)	0.048** (0.002)	0.040* (0.099)	0.074** (0.004)	0.059** (0.016)
Average GDP growth rate						
<i>Personal characteristics</i>						
CCYL	0.052** (0.011)	0.053** (0.003)	0.039** (0.037)	0.030** (0.033)	0.032** (0.002)	0.033** (0.003)
Tenure	-0.080** (0.034)	-0.077** (0.042)	-0.080** (0.024)	-0.081** (0.024)	-0.048** (0.032)	-0.047** (0.043)
Experience	0.028 (0.427)	0.238** (0.021)	0.098 (0.616)	0.240** (0.013)	0.434** (0.031)	0.043 (0.422)
Age	-3.021** (0.008)	-3.194** (0.008)	-2.084** (0.049)	-2.015* (0.069)	-1.874** (0.005)	-1.957** (0.006)
Education	0.011 (0.415)	0.012 (0.326)	0.005 (0.668)	0.006 (0.607)	0.007 (0.360)	0.008 (0.294)
Expertise	-0.006 (0.801)	0.048** (0.032)	0.047** (0.043)	0.048** (0.020)	0.050** (0.017)	-0.001 (0.964)
<i>Control variables</i>						
Log population	0.367* (0.096)	0.336 (0.131)	0.182 (0.380)	0.162 (0.436)	0.214 (0.107)	0.198 (0.137)
Observation	1356	1356	1356	1356	1356	1356
Log likelihood	-362.509	-358.327	-474.292	-361.544	-472.646	-357.263
Pseudo R2	0.111	0.121	0.102	0.101	0.113	0.124

The dependent variable is a categorical variable that takes the value 1 if a municipal party secretary is replaced, 2 if terminated, 3 if the same level and 4 if promoted. Estimations from a multinomial logit approach with fixed-effects where the reference category is replaced (1), terminated (2) and same level (3). All regressions include year dummies. The *P* values are in parentheses. ** and * indicate statistical significance at the 5% and 10% levels, respectively

the panel conditional logit regression is employed as the benchmark model. The estimation results indicate that the municipal annual GDP growth rate, particularly the growth rate during the leader's tenure, may have positive and statistically positive influences on the municipal leader's chances of being promoted to a higher-level position. In addition to economic performance, the leader's connection with China's Communist Youth League, political experience as the principal or deputy secretary-general office director, educational level and professional expertise all may improve the leader's promotion possibilities. By contrast, an older age and longer length of tenure are found to have negative impacts on a municipal leader's odds of being promoted. Moreover, the multinomial logit model estimation results also indicate that better economic performance would enhance the chances of being promoted than all of the other turnover possibilities. These findings are quite robust to various types of sensitivity analyses.

The basic conclusions of this study to some extent offer an answer to a myth: How are Chinese cadres assigned and promoted? As is well known, China's central authority is fully responsible for the turnover of officials; therefore, reasonable and rational evaluation of an official's ability is vital to the central authority. Our estimation results prove that for the sample period between 2002 and 2013, economic performance is still considered a key indicator of a leader's ability of city management. The findings of this paper also reflect the CPC's consistent argument of taking economic development as the central task. Moreover, we have also found evidence for the CPC's criteria for choosing cadres: higher education, more professional, younger age and sufficient political experience.

Finally, it should be noted that, as an interesting and important reform of personnel system recently, the CPC has already vowed to upgrade and improve the evaluation standards of cadres. The most important change is that the GDP growth rate will not be the sole indicator of leaders' management performance. Instead, more indicators involving residents' welfare would also be considered, including good environmental quality and reasonable industrial infrastructure.⁷ The CPC has already noticed that, the previous evaluation system placed too much emphasis on the economic performance of the cadres, which have caused many problems. For instance, the provincial and local officials may care too much about short-run economic growth and ignore long-run potential of economic development. Moreover, to enhance the possibility of being promoted, some cadres tend to encourage the energy- and pollution-intensive industries for faster GDP growth rate, which take a heavy toll on local environment and financial sustainability. The more comprehensive evaluation system of Chinese officials will be helpful to achieve China's sustainable development. However, the effects of the new system deserve further observation in the future, particularly when there is significant evidence that the conventional wisdom of focusing on GDP growth rate had still prevailed until very recently.

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Appendix

See Table 8.

⁷ For more information, please refer to <http://www.bloomberg.com/news/articles/2014-03-12/chinese-cadres-told-going-green-rivals-gdp-to-get-ahead-in-party>.

Table 8 Regional definition for sample cities in China

East (52)	Beijing, Tianjin, Shijiazhuang, Tangshan, Qinhuangdao, Handan, Baoding, Shenyang, Dalian, Anshan, Fushun, Benxi, Jinzhou, Shanghai, Nanjing, Wuxi, Xuzhou, Changzhou, Suzhou, Nantong, Lianyungang, Yangzhou, Hangzhou, Ningbo, Wenzhou, Jiaxing, Huzhou, Shaoxing, Taizhou, Fuzhou, Xiamen, Quanzhou, Jinan, Qingdao, Zibo, Zaozhuang, Yantai, Weifang, Jining, Taian, Weihai, Rizhao, Guangzhou, Shaoguan, Shenzhen, Zhuhai, Shantou, Foshan, Zhanjiang, Zhongshan, Haikou, Sanya
Central (31)	Taiyuan, Datong, Yangquan, Changzhi, Linfen, Changchun, Jilin, Haerbin, Qiqihaer, Daqing, Mudanjiang, Hefei, Wuhu, Maanshan, Nanchang, Jiujiang, Zhengzhou, Kaifeng, Luoyang, Pingdingshan, Anyang, Jiaozuo, Wuhan, Yichang, Jingzhou, Changsha, Zhuzhou, Xiangtan, Yueyang, Changde, Zhangjiajie
West (30)	Huhehaote, Baotou, Chifeng, Nanning, Liuzhou, Guilin, Beihai, Chongqing, Chengdu, Panzhihua, Luzhou, Mianyang, Yibin, Guiyang, Zunyi, Kunming, Qujing, Lasa, Xi An, Tongchuan, Baoji, Xianyang, Yanan, Lanzhou, Jinchang, Xining, Yinchuan, Shizuishan, Wulumuqi, Kelamayi

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