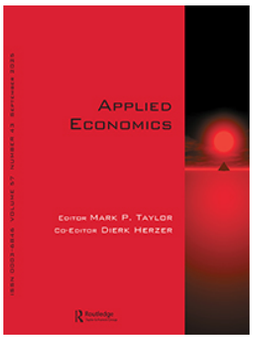

Applied Economics

ISSN: 0003-6846 (Print) 1466-4283 (Online) Journal homepage: www.tandfonline.com/journals/raec20

How Chinese local governments respond to competing targets: Evidence from the COVID-19 epidemic

Kun Lang, Alexander X. Li & Shaobo Long

To cite this article: Kun Lang, Alexander X. Li & Shaobo Long (11 Sep 2025): How Chinese local governments respond to competing targets: Evidence from the COVID-19 epidemic, Applied Economics, DOI: 10.1080/00036846.2025.2555017

To link to this article: https://doi.org/10.1080/00036846.2025.2555017

Published online: 11 Sep 2025.

APPLIED ECONOMICS
https://doi.org/10.1080/00036846.2025.2555017

Routledge
Taylor & Francis Group

How Chinese local governments respond to competing targets: Evidence from the COVID-19 epidemic

Kun Lang [a], Alexander X. Li [b] and Shaobo Long [c]

[a]School of Marxism, Tsinghua University, Beijing, China; [b]Stephen M. Ross School of Business, University of Michigan, Ann Arbor, MI, USA; [c]School of Public Policy and Administration, Chongqing University, Chongqing, China

ABSTRACT

This article examines how Chinese local governments respond to competing policy targets during crises, using the COVID-19 epidemic as a quasi-natural experiment. We construct a novel panel dataset covering 278 prefecture-level cities in China to investigate whether city leaders' promotion incentives – measured by tenure and age – affect their performance in epidemic control and economic development. Employing difference-in-differences and fixed effects regressions, we find no significant variation in epidemic control outcomes across officials with different tenures or ages. However, during the COVID-19 epidemic, cities governed by short-tenure leaders experienced a 0.84% point higher GDP growth rate compared to those led by long-tenure officials. Furthermore, the impact of officials' promotion incentives on GDP growth was particularly pronounced among older officials, in northern regions, and after the epidemic was brought under control. These results suggest that competing policy targets may generate unintended performance distortions for local officials, particularly among leaders with lower promotion incentives.

KEYWORDS

Local government; competing targets; promotion incentive; epidemic control; GDP growth

JEL CLASSIFICATION

H12; H70; H83; R11

I. Introduction

The COVID-19 epidemic has drastically reshaped the global economic landscape, posing unprecedented challenges for governments worldwide in balancing epidemic control with economic recovery efforts (Adefeso and Muraina 2024). In China, local governments faced the additional pressure of meeting competing targets set by the central government. While previous studies have explored variations in epidemic control measures across different cities in China, attributing these differences to factors such as city size, healthcare resources, and population mobility (Chen et al. 2021; Li et al. 2022; Liu 2020; Qiu, Chen, and Shi 2020; Sun et al. 2020; Zha et al. 2022), the role of local officials' promotion incentives remains underexplored.

This article contributes to the literature by emphasizing how local government officials' promotion incentives – proxied by tenure and age – serve as crucial determinants in prioritizing competing targets from the central government. The COVID-19 epidemic provides a unique quasi-natural experiment to investigate this dynamic. On 23 February 2020, shortly after the COVID-19 outbreak, President Xi Jinping emphasized the urgent need to coordinate epidemic control and economic development.[1] This marked the launch of a new performance management (PM) framework for local governments, emphasizing two potentially conflicting targets: epidemic control and economic development. Although the central government set the unified targets, the implementation of these targets was left to local governments, where varying responses could be observed (Zha et al. 2022; Zhang 2021). This divergence presents an opportunity to examine how promotion incentives might influence the decision-making of local officials, particularly in contexts where their career advancement may depend on their performance in these competing areas.

Using a novel panel dataset covering 278 prefecture-level cities in China, our study advances the literature by integrating the analysis of officials' promotion incentives with their responses to two

CONTACT Alexander X. Li axli@umich.edu Stephen M. Ross School of Business, University of Michigan, 701 Tappan Street, Ann Arbor, MI 48109, USA

[1]Xi Jinping. 2020. Speech at a Meeting to Advance the Work on Coordinating the Prevention and Control of the COVID-19 and Economic and Social Development. Chinese Central Government Website, February 23. http://www.gov.cn/xinwen/2020–02/24/content_5482502.htm [accessed October 10, 2021].

competing policy targets during a major public health crisis. This approach is novel in applying characteristics such as age and tenure to understand multi-tasking dilemmas in local governance, particularly within China's distinctive institutional setting. The findings offer valuable implications for designing more effective performance management frameworks and crisis response strategies.

The remainder of the article proceeds as follows. In the next section, we provide a brief review of the literature. Subsequently, we establish our theoretical hypotheses. We then introduce the methodology, including sample selection, variable measurement, data sources, and empirical models. The fourth section presents the empirical findings, followed by a discussion and conclusion.

II. Theory and hypotheses

Performance management

Outcomes-based performance management (PM) system has been adopted by governments worldwide (Van Dooren, Bouckaert, and Halligan 2015). PM aims to enhance the efficiency and effectiveness of public services by defining, monitoring, and using objective indicators to evaluate the performance of organizations and programs (Heinrich 2002). Numerous studies have empirically tested the effectiveness and impact of PM in public organizations (Gerrish 2016; Hall, Shin, and Bartels 2022; Yang and Hsieh 2007). However, the validity of empirical tests is often challenged for the following three reasons. First, multi-target mixing. Governments are often faced with multiple and potentially competing targets (Andersen, Boesen, and Pedersen 2016; Li 2021; Zhang 2021), such as environmental protection (Ran 2017; Shah et al. 2022b; Zhang and Wu 2020), economic growth (Li and Zhou 2005; Ma 2016), and social stability (Gao 2015). The complex and interactive relationships among these targets make it difficult to isolate the effects of specific PM factors. Second, measurement validity. The implementation of PM systems may lead to data manipulation by local governments (Chen et al. 2012; Kalgin 2016; Wallace 2016). Research shows that PM may encourage behaviour that improve reported performance metrics while undermining actual outcomes (Courty and Marschke 2004; Heinrich and Marschke 2010; Jacobsen and Andersen 2014; Verbeeten 2008). Third, selection bias. The adoption of PM systems is not randomly selected. Organizations with initially poor performance are more likely to be subject to PM monitoring, and as a result, may demonstrate greater improvements over time (Julnes and Holzer 2001).

The COVID-19 epidemic provides a unique opportunity to examine the impacts of PM while mitigating the typical challenges described above. First, although local governments in China often face multiple and complex targets (Li 2021; Wang, Zhang, and Zhou 2020; Zhang 2021), this situation changed after the COVID-19 outbreak. In response to the epidemic, the Chinese central government introduced a new PM system for local governments. The previously broad targets were streamlined into two primary targets – epidemic control and economic development, thereby avoiding the multi-target mixing problem. Second, as an unexpected and exogenous shock, the COVID-19 epidemic affected all cities across China (WHO 2020). This uniform exposure provides a unique quasi-natural experiment to study how the PM system works. The responses of local governments to the revised PM system can be directly reflected in the performance of local epidemic control and economic development, thereby avoiding the selection bias problem. Third, while local governments in China have been known to manipulate data on GDP growth and air pollution (Ghanem and Zhang 2014; Wallace 2016), the costs of falsifying epidemic-related data are significantly higher. Due to the severe penalties associated with misreporting COVID-19 data, local officials have strong incentives to report epidemic figures truthfully. Research suggests that there is no evidence that China manipulated its reported data on COVID-19 cases (Isea 2020), thus avoiding the measurement validity problem.

Target-based responsibility system in China

Research on PM in the Chinese public sector indicates that the target-based responsibility system (TRS) is the core mechanism to motivate and control local governments (Jing, Cui, and Li 2015; Yu and Ma 2015). The targets faced by local

governments in China can be classified into three categories: soft targets, hard targets, and priority targets (Edin 2003; Liang and Langbein 2015). First, soft targets (*ruan zhibiao*) are often associated with general policies that are broadly defined and characterized as policy directives or mission statements. Common examples of soft targets include cultural and social development. Second, hard targets (*ying zhibiao*) refer to measurable and quantifiable performance indicators, and are usually related to economic development. Typical hard targets include GDP growth (Li and Zhou 2005; Ma 2016; Zhu et al. 2024), fiscal revenue (Jin, Qian, and Weingast 2005; Qian and Weingast 1997), and infrastructure construction (Li 2011; Wang, Zhang, and Zhou 2020). Third, priority targets with veto power (*yipiao foujue*) are exclusively used for top priorities on the central government policy agenda. If these targets are not successfully attained, officials will fall short in their performance evaluation, regardless of how successfully they accomplished other tasks. Over the past two decades, only four such veto-power targets have been centrally mandated: birth control (Liang and Langbein 2015), social stability (Gao 2015), environmental protection (Ran 2017; Shah et al. 2022a; Zhang and Wu 2020), and COVID-19 epidemic control (Ding and Zhang 2022).

Given the competing attention and resources required to pursue each target, local governments must make trade-off in priority allocation and sequential arrangement among multiple targets (Yu and Ma 2015). Based on the performance feedback of different types of targets, local governments officials are more likely to focus on priority targets and hard targets (Edin 2003; Liang and Langbein 2015). On the one hand, local officials prioritize the achievement of priority targets with veto power, which constitutes the basis for personnel evaluations and promotion decisions (Edin 2003). On the other hand, they also strive to accomplish hard targets, which is important both for bonuses and for political rewards (Li and Zhou 2005; Zhu et al. 2024).

After the COVID-19 outbreak, the Chinese central government simplified the complex TRS into two primary targets: epidemic control and economic development. Epidemic control became a typical priority target with veto power (Ding and Zhang 2022). In response to the outbreak, the Chinese central government upheld a strict *dynamic zero-case policy*. Officials who perform poorly in epidemic control were promptly held accountable or even removed from their posts.[2] By 30 April 2020, a total of 757 local officials had been held accountable for ineffective epidemic control.[3] In contrast, economic development remained one of the most important hard targets for local governments. Research has shown that higher GDP growth rates significantly increase the likelihood of promotion for local officials (Chen, Li, and Zhou 2005; Li and Zhou 2005). Even after the COVID-19 outbreak, the emphasis on GDP growth remained unchanged. President Xi Jinping repeatedly urged governments at all levels to focus on economic development to ensure that the goal of *building a moderately prosperous society in all respects by 2020* can be achieved on schedule.[4]

Summary and hypotheses

The implementation of a new PM system during the COVID-19 epidemic provides a unique opportunity to examine how local officials respond to competing targets. Given that epidemic control became a priority target with veto power, local officials were compelled to ensure the success of the *dynamic zero-case policy* in order to maintain political correctness. However, the economic and social costs of lockdown measures can be extremely high (Allen 2022; Ke and Hsiao 2022; Xu and Wei 2021). Consequently, officials with strong promotion incentives may seek to stimulate local economic growth even during the epidemic, by adopting more prudent epidemic control strategies to avoid excessive harm to social and economic development. In contrast, officials with weaker promotion incentives may do their utmost to

[2]Xinhua News. 2020. Facing the COVID-19, Officials Must Be Held Accountable for Malfeasance. Chinese Central Government Website, February 11. http://www.gov.cn/guowuyuan/2020–02/11/content_5477512.htm [accessed October 10, 2021].
[3]The Paper Website. 2020. Within 103 days, 757 officials across China were held accountable for ineffective epidemic control. The Paper Website, June 22. https://www.thepaper.cn/newsDetail_forward_7931579 [accessed October 10, 2021].
[4]Xinhua News. 2020. Xi Stresses Achieving Moderately Prosperous Society in All Respects. Xinhua Website, May 13. http://www.xinhuanet.com/english/2020–05/13/c_139051548.htm [accessed October 10, 2021].

eliminate any possibility of a local COVID-19 outbreak, focusing on political security even at the expense of other development goals. In summary, when faced with unified but competing targets, local officials with different promotion incentives may adopt distinct strategies, ultimately affecting both epidemic control outcomes and GDP growth. This study focuses on two key factors that shape local officials' promotion incentives: tenure and age.

In political business cycle studies, tenure is considered a key factor affecting the behaviour and incentives of officials (Besley and Case 1995; Hibbs 1977; Nordhaus 1975; Rogoff and Sibert 1988). In China, where there is no fixed term, tenure significantly affects an official's likelihood of promotion (Geng, Pang, and Zhong 2016; Guo 2009; X. Wang and Xu 2008; Zhang and Gao 2007). Research indicates that from 2000 through 2011, the average term of office for city leaders was approximately 3.7 years, suggesting that turnover among local officials occurs frequently (Luo and Qin 2021; Wang, Zhang, and Zhou 2020). This frequent turnover profoundly influences the behaviour of local officials. As the saying goes, 'officials work in the first year, observe in the second year, and wait (for turnover) in the third year'. Based on this, we predict that long-tenure officials, who are waiting for turnover, will place greater emphasis on epidemic control to avoid making mistakes. In contrast, short-tenure officials are more likely to prioritize long-term plans for the city, focusing more on economic development. Therefore, we formulate the following hypotheses:

H1: Long-tenure officials perform better in epidemic control.

H2: Short-tenure officials perform better in economic development.

Besides tenure, age is another critical factor influencing the promotion incentives of Chinese local officials. Since the establishment of a mandatory retirement age in the early 1980s, age has become a key determinant in career advancement. In China, 57 years old is generally considered a threshold for most local officials. The literature indicates that city leaders over the age of 57 have minimal chances of promotion (Huang et al. 2020; Xi, Yao, and Zhang 2018). Based on this, we hypothesize that older officials will be more conservative in policy making, and place greater emphasis on epidemic control. In contrast, younger officials are likely to focus more on accomplishing local economic development targets to gain an advantage in future promotions. We thus formulate the following hypotheses:

H3: Older officials perform better in epidemic control.

H4: Younger officials perform better in economic development.

III. Research methodology

Data source

To test the above hypotheses, We construct a novel panel dataset covering 278 prefecture-level cities in China. The dataset includes variables on performance outcomes – namely, the Epidemic Control Index and GDP growth rate – as well as the biographical information of city leaders[5] (including tenure, age, gender, race, and education background), and key city-level characteristics (such as GDP per capita, population, population mobility, geographic location, government expenditure, import, and export). Except for the Epidemic Control Index, which consists of monthly data from January to December 2020, all other variables are collected on a quarterly basis from Q1 2019 to Q4 2020.

The data sources are as follows. The COVID-19 case statistics are obtained from the *CSMAR COVID-19 and Economic Research Database*, which provides daily confirmed case data for each Chinese city from January 10 to 31 December 2020. Economic and social indicators are collected from the *CEIC database*, which compiles city-level economic statistics published by local statistical

[5]The top city officials are the party secretary and the city mayor. The party secretary is more powerful than the city mayor due to the ruling position of the Chinese Communist Party. We therefore refer to the city's party secretary as the city leader in this paper.

bureaus. Biographical information on city leaders is manually collected and covers 515 officials who were in office between 2019 to 2020.

Dependent variables

Epidemic control index. Following the method of Leng and Lemahieu (2021), this article constructs the monthly Epidemic Control Index (ECI) to measure the performance of epidemic control across different prefecture-level cities, with values ranging from 0 (worst performing) to 100 (best performing). Figure 1 presents a heatmap of the 2020 annual average ECI for each city, showing that there is no obvious geographical distribution pattern of the ECI. As discussed in the previous sections, we argue that this variation may be partly explained by the distinct strategies adopted by local officials.

GDP growth rate. This article uses the quarterly year-on-year real GDP growth rate to measure the performance of economic development in different cities. Figure 2 presents a heatmap of the 2020 annual GDP growth rate for each city, showing considerable variation in economic development performance across cities. We argue that this variation may be influenced by the promotion incentives of local officials.

Independent variables

Tenure group. Tenure is a key factor influencing the promotion incentives of Chinese local officials. Three-year tenure is often considered a threshold

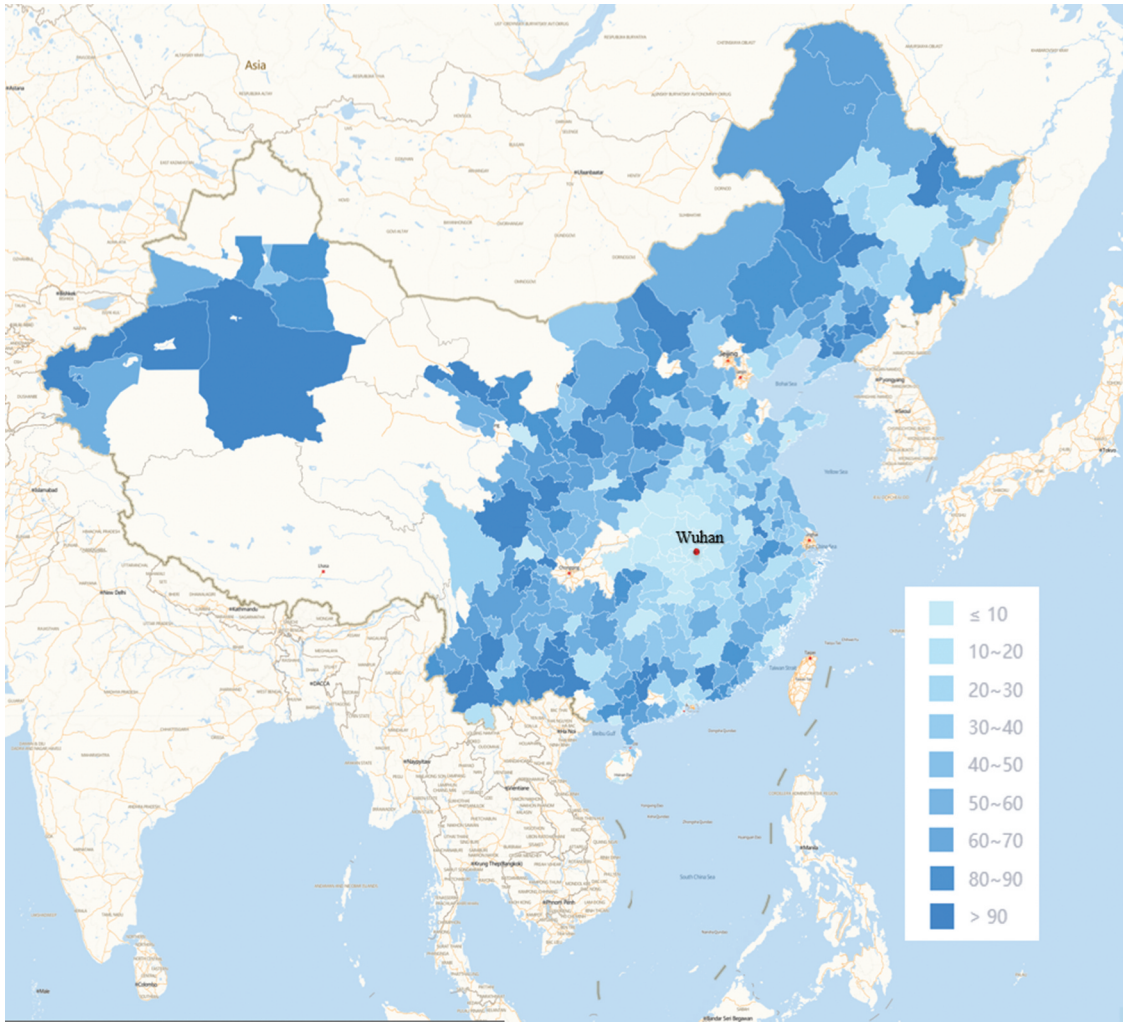

Figure 1. The annual average ECI of each city in 2020 (0–100).

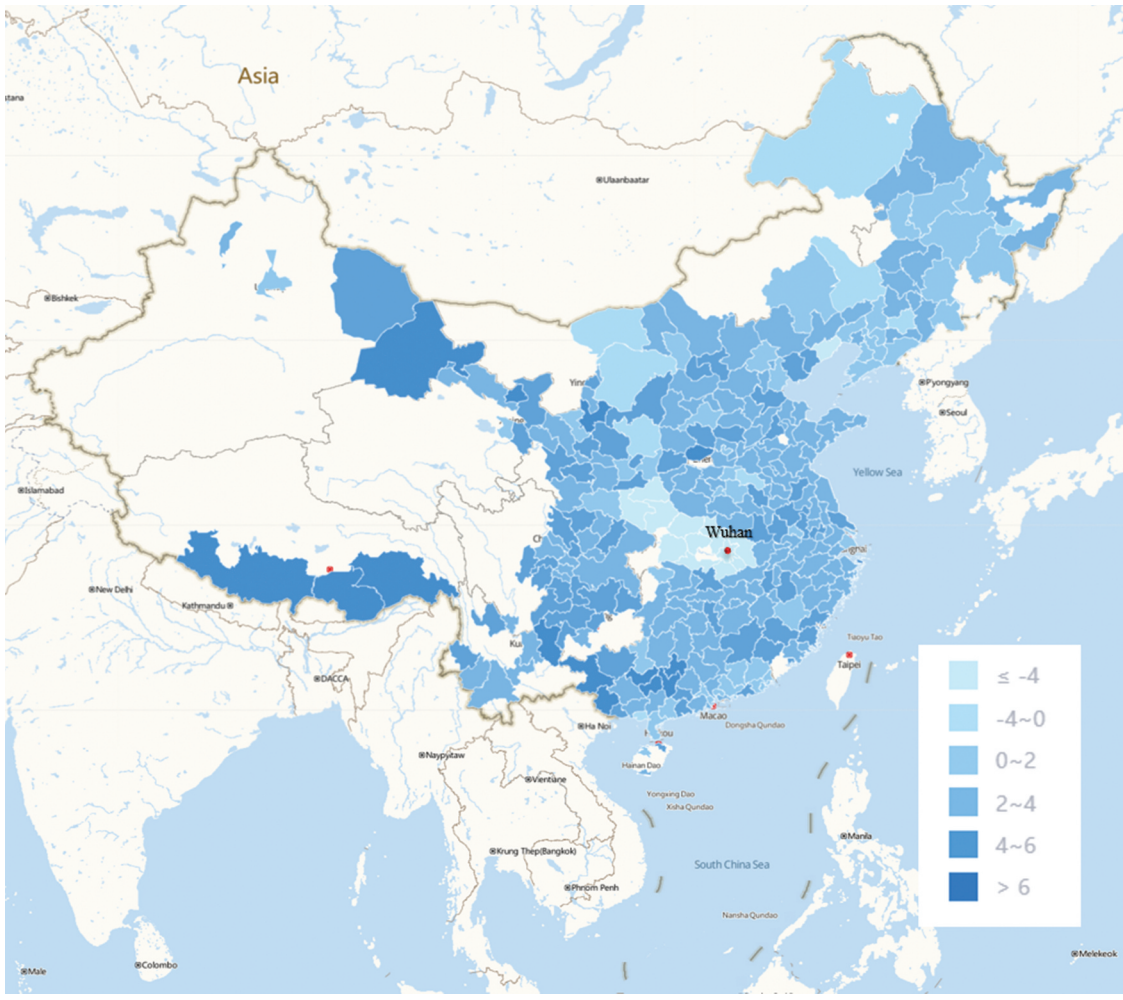

Figure 2. The GDP growth rate of each city in 2020 (%).

for most city leaders. Over the past two decades, turnover among city leaders has been frequently, with most city leaders serving less than three years in their posts (Luo and Qin 2021; Wang, Zhang, and Zhou 2020). Therefore, we categorize city leaders in our dataset into two groups based on whether their tenure exceeded three years at the time of the COVID-19 outbreak. The *TenureGroup* variable equals to 1 if the city leader's tenure was less than three years, and 0 otherwise.

Age group. Age is another important determinant influencing the promotion incentives of Chinese local officials. In general, 57 years old is considered a threshold for most city leaders, with officials over the age of 57 having minimal chances of promotion (Huang et al. 2020; Xi, Yao, and Zhang 2018). Consequently, we categorize city leaders in our dataset into two groups based on whether their age exceeded 57 years old at the time of the COVID-19 outbreak. The *AgeGroup* variable equals to 0 if the city leader was over 57, and 1 otherwise.

Control variables

This study also includes a set of control variables. The official-level control variables are as follows: (1) *Gender*, a dummy variable equals to 1 if the city leader is a female and 0 otherwise. (2) *Race*, a dummy variable equals to 1 if the city leader is a minority and 0 otherwise. (3) *Scholar*, a dummy variable equals to 1 if the city leader is a scholar or engineer and 0 otherwise. (4) *Major*, a dummy variable equals to 1 if the city leader majors in STEM and 0 otherwise. (5) *Degree*, a factor variable denotes the highest educational degree attained by

the city leader. By controlling for these personal attributes, we aim to rule out the influence of officials' personal abilities, which may affect the performance of epidemic control and economic development.

The city-level control variables include: (1) *log (GDPpercapita)*, the logarithm of the city's real GDP per capita, controlling for the level of economic development. (2) *log(Population)*, the logarithm of the city's permanent resident population, controlling for population density. (3) *Immigration*, the percentage of the inflow population in a province relative to the total floating population, controlling for population mobility, which can affect the spread of the epidemic. (4) *log(Distance)*, the logarithm of the distance from the epicentre (Wuhan's Huanan seafood market), addressing the spatial correlation issue that may affect local epidemic control performance. (5) *GovExp*, the ratio of government spending to GDP, as it is directly related to the PM system. (6) *Import* and *Export*, representing the ratio of import and export values to GDP, controlling for the economic openness that may affect the epidemic control and economic development.

The variable definitions and descriptive statistics are presented in Table 1.

Model construction

Based on our previous theoretical analysis and hypotheses, this article treats the COVID-19 outbreak as a quasi-natural experiment to examine how local government officials respond to competing targets. We begin by examining whether the promotion incentives of city leaders – proxied by their tenure and age – significantly affect the performance of local epidemic control. Our fixed-effects model is specified as follows:

$$\mathrm{ECI}_{it} = \alpha + \beta_1 \mathrm{TenureGroup}_{it} + \beta_2 \mathrm{AgeGroup}_{it} + \beta_n \mathrm{X}_{it} + \lambda_i + \mu_t + \varepsilon_{it} \quad (1)$$

Where ECI_{it} is the dependent variable, denoting the Epidemic Control Index constructed, measuring the performance of epidemic control in city i at time t. $\mathrm{TenureGroup}_{it}$ and $\mathrm{AgeGroup}_{it}$ are the explanatory variable, denoting the tenure group and age group of the city leader respectively. X_{it} is a series of control variables, as defined in Table 1. λ_i denotes city fixed effects, controlling for unobserved heterogeneity such as geographical location and public health capacity that may affect epidemic control. μ_t denotes time fixed effects, capturing common time shocks such as national policy shifts or seasonal effects. ε_{it} is the random error term. In

Table 1. Variables, measures, and descriptive statistics.

Variable	Measure	Num	Mean	SD	Min.	Max.
ECI	Epidemic Control Index, measuring the relative performance of local epidemic control	3614	50.314	28.348	0.33	100
GDP growth	Year-on-year real GDP growth rate (%)	1996	2.8	5.903	−40.90	13.00
TenureGroup	Equal to 1 if the city leader's tenure was less than three years at the time of the COVID-19 outbreak, 0 otherwise	1996	0.663	0.473	0	1
AgeGroup	Equal to 0 if the city leader was over 57 years old at the time of the COVID-19 outbreak, 1 otherwise	1996	0.488	0.500	0	1
Tenure	City leader's time in his current post	1996	2.416	1.648	0	9.68
Age	City leader's age when appointed to his current post	1996	54.08	2.644	44	59
Race	Equal to 1 if the city leader is a minority, 0 otherwise	1996	0.0610	0.239	0	1
Gender	Equal to 1 if the city leader is a female, 0 otherwise	1996	0.0360	0.185	0	1
Scholar	Equal to 1 if the city leader is a scholar, 0 otherwise	1996	0.239	0.427	0	1
Major	Equal to 1 if the city leader majors in STEM, 0 otherwise	1996	0.207	0.405	0	1
Degree	1 for bachelor's degree, 2 for master's degree, 3 for doctoral degree	1996	2.168	0.598	1	3
Post	Equal to 1 if in times after the COVID-19 outbreak, 0 otherwise.	1996	0.512	0.500	0	1
log(GDPpercapita)	Real GDP per capita (take log)	1996	1.653	0.516	0.27	2.98
log(Population)	Number of permanent residents (take log)	1882	5.906	0.658	3.20	7.33
Immigration	The province's inflow population/total floating population	1825	4.439	3.255	0.36	19.69
log(Distance)	Distance from the local city hall to Wuhan's Huanan seafood market (take log)	1996	6.793	0.660	1.87	8.19
GovExp	Government expenditure/GDP	1992	0.229	0.120	0.066	1.02
Import	Import value/GDP	1968	0.066	0.112	0	0.80
Export	Export value/GDP	1980	0.097	0.155	0	1.71

The dataset includes 278 prefecture-level cities in China. Except for ECI, which is monthly data from January 2020 to December 2020, all other variables are quarterly data from Q1 2019 to Q4 2020.

this specification, the main concern is whether the coefficients β_1 and β_2 are statistically significant. β_1 represents the difference in epidemic control performance between short-tenure and long-tenure city leaders, thereby testing Hypothesis 1 (H1). Similarly, β_2 represents age-related differences in epidemic control performance, testing Hypothesis 3 (H3).

In addition, we examine whether the tenure of city leaders significantly affects the performance of local economic development. Since GDP growth tends to exhibit momentum effects, which may lead to endogenous problems. To address this concern, we treat the COVID-19 outbreak as an exogenous shock, and classify city leaders into a treatment group (short-tenure officials) and a control group (long-tenure officials). We then employ a difference-in-difference (DID) regression approach to identify the causal effect of promotion incentives on economic growth during the epidemic (Goodman-Bacon and Marcus 2020; Lechner 2011). The DID model is specified as follows:

$$\begin{aligned} GDPgrowth_{it} = {} & \alpha + \beta_1 (TenureGroup_{it} \times Post_{it}) \\ & + \beta_2 TenureGroup_{it} + \beta_3 Post_{it} \\ & + \beta_n X_{it} + \lambda_i + \mu_t + \varepsilon_{it} \end{aligned} \tag{2}$$

Where the dependent variable $GDPgrowth_{it}$ denotes the real GDP growth rate of city i at time t. $TenureGroup_{it}$ is a dummy variable that differentiates the treatment group and control group in the DID test. $Post_{it}$ is a dummy variable equal to 1 for the post-COVID-19 period (after December 2019), and 0 otherwise. X_{it} is a series of control variables defined in Equation (1). λ_i and μ_t denote province-fixed effects and time-fixed effects, respectively. ε_{it} is the random error term. The coefficient β_1 is the DID estimator, which captures the differential change in GDP growth between cities led by short-tenure and long-tenure officials after the outbreak. A statistically significant β_1 would support Hypothesis 2 (H2), indicating that city leaders with shorter tenures – likely more promotion-motivated – tended to prioritize economic development more actively during the COVID-19 crisis.

Finally, we examine whether the age of city leaders significantly affects the performance of local economic development. Once again, we employ a DID regression approach. The model is specified as follows:

$$\begin{aligned} GDPgrowth_{it} = {} & \alpha + \beta_1 (AgeGroup_{it} \times Post_{it}) \\ & + \beta_2 AgeGroup_{it} + \beta_3 Post_{it} + \beta_n X_{it} \\ & + \lambda_i + \mu_t + \varepsilon_{it} \end{aligned} \tag{3}$$

$AgeGroup_{it}$ is a dummy variable that differentiates the treatment group (younger officials) and control group (older officials) in the DID test. $Post_{it}$ is a dummy variable equal to 1 for the post-COVID-19 period (after December 2019), and 0 otherwise. The dependent variable $GDPgrowth_{it}$, the control variables X_{it}, the time-fixed effects μ_t, province-fixed effects λ_i, and error term ε_{it} are defined as in Equation (2). The coefficient β_1 is the DID estimator, which captures the differential change in GDP growth between cities led by younger officials and older officials after the outbreak. A statistically significant β_1 would support Hypothesis 4 (H4), suggesting that younger leaders – presumably more promotion-oriented – were more inclined to prioritize economic recovery efforts during the COVID-19 crisis.

IV. Empirical results and analysis

Baseline regression results

Firstly, we test whether the promotion incentives of city leaders – proxied by their tenure and age – significantly affect the performance of local epidemic control. Table 2 presents the estimation results of Equation (1), using monthly data from January to December 2020. Standard errors are clustered at the city level and reported in parentheses. Column (1) and (2) show the baseline regression results. Contrary to Hypotheses 1 and 3 (H1 and H3), the coefficients of *TenureGroup* and *AgeGroup* are statistically insignificant, suggesting that neither the tenure nor the age of city leaders significantly affected epidemic control outcomes. Our explanation lies in the institutional context of cadre evaluation. After the COVID-19 outbreak, epidemic control became the priority target with

Table 2. Effects of local officials' tenure and age on epidemic control.

	Baseline regression		Robustness test		Heterogeneity analysis			
Dependent variable	Full Sample ECI (1)	Full Sample ECI (2)	Without Hubei ECI (3)	Without Turnover ECI (4)	Before March 25th ECI (5)	After March 25th ECI (6)	Northern China ECI (7)	Southern China ECI (8)
TenureGroup	−3.773	−3.067	−3.789	−4.461	−2.726	−4.175	−4.969	−3.828
	(3.067)	(2.800)	(2.838)	(3.166)	(2.681)	(3.044)	(4.605)	(3.660)
AgeGroup	2.464	−1.450	−0.390	−1.644	−1.146	−0.017	−2.899	1.193
	(2.557)	(2.437)	(2.442)	(2.765)	(2.324)	(2.650)	(4.153)	(3.229)
log(GDPpercapita)		−17.507***	−20.307***	−16.710***	−15.063***	−22.195***	−14.071*	−24.193***
		(4.780)	(4.725)	(5.173)	(4.255)	(5.088)	(7.607)	(6.708)
log(Population)		−15.447***	−15.854***	−16.783***	−12.132***	−17.178***	−13.723***	−16.849***
		(2.173)	(2.264)	(2.486)	(2.198)	(2.397)	(4.213)	(2.938)
Immigration		0.013	−0.013	−0.345	0.269	−0.104	−1.412	0.355
		(0.308)	(0.325)	(0.333)	(0.563)	(0.556)	(1.314)	(0.350)
log(Distance)		2.767	17.107***	20.991***	17.111***	17.243***	22.969**	8.854
		(6.029)	(6.005)	(6.086)	(5.522)	(6.370)	(9.197)	(7.413)
GovExp		−19.531	−26.690	−25.798	−10.784	−32.066	13.523	−53.845
		(27.259)	(26.967)	(30.777)	(23.544)	(28.889)	(35.091)	(44.304)
Import		−21.226	−24.362*	−34.968**	−17.322	−26.830*	−14.574	−22.333
		(14.313)	(14.524)	(15.293)	(14.817)	(15.108)	(41.890)	(18.461)
Export		−9.172	−6.322	−3.499	−2.855	−7.769	−39.155	0.341
		(12.134)	(11.993)	(11.346)	(10.984)	(12.903)	(45.543)	(11.808)
Constant	70.063***	165.651***	65.901	45.288	27.318	75.529	22.875	139.049**
	(6.279)	(48.270)	(51.805)	(52.139)	(47.968)	(54.828)	(82.901)	(67.679)
Control variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,614	2,752	2,631	2,213	712	1,919	1,106	1,525
R-squared	0.373	0.544	0.505	0.513	0.450	0.534	0.537	0.511

This table reports the estimation results for Equation (1) based on the monthly data from January to December 2020. The standard errors are clustered at city level and reported in parentheses. * significant at 10% level; ** significant at 5% level; *** significant at 1% level.

veto power (Ding and Zhang 2022). In such a setting, all local officials – regardless of age or tenure – faced intense political pressure to meet epidemic control targets. This likely led to uniform behaviour across officials, thereby attenuating the influence of individual career incentives on performance outcomes (Edin 2003). The results for control variables in Table 2 align with findings from the existing literature, indicating that population density, geographic location, economic strength, and openness are important determinants of epidemic control performance (Li et al. 2022). The results in column (3) show that, on average, a 1% increase in GDP per capita is associated with a 0.20-point decrease in the ECI ($\beta = -20.307$, $p < 0.01$). A 1% increase in population is associated with a 0.16-point decrease in the ECI ($\beta = -15.854$, $p < 0.01$). A 1% increase in distance from the epicentre leads to a 0.17-point increase in the ECI ($\beta = 17.107$, $p < 0.01$). A 1% increase in the import-to-GDP ratio results in a 0.24-point decrease in the ECI ($\beta = -24.362$, $p < 0.1$).

Secondly, we test whether the tenure of city leaders significantly affects the performance of local economic development. Table 3 presents the estimation results of Equation (2), using quarterly data from Q1 2019 to Q4 2020. Standard errors are clustered at the city level and reported in parentheses. Column (1) and (2) show the baseline regression results. We find that the coefficient of the DID estimator (*TenureGroup*×*Post*) is positive and statistically significant ($\beta = 0.842$, $p < 0.05$), while the coefficient of the main independent variable (*TenureGroup*) is not significant. This indicates that prior to the COVID-19 outbreak, there was no significant difference in GDP growth rate between cities led by officials with shorter and longer tenures. However, after the outbreak, cities led by short-tenure officials experienced, on average, a 0.84% point higher GDP growth rate compared to those led by long-tenure officials. This results suggest that when faced with competing targets, city leaders with different promotion incentives behaved differently (Z. Wang, Zhang, and Zhou 2020; Zhu et al. 2024). Specifically, short-tenure officials were more likely to prioritize long-term plans for the city, placing greater emphasis on economic development. In contrast, for long-tenure

Table 3. Effects of local officials' tenure on economic development.

	Baseline regression		Robustness test		Heterogeneity analysis			
Dependent variable	Full Sample GDP growth (1)	Full Sample GDP growth (2)	Without Hubei GDP growth (3)	Without Turnover GDP growth (4)	Before March 25th GDP growth (5)	After March 25th GDP growth (6)	Northern China GDP growth (7)	Southern China GDP growth (8)
TenureGroup×Post	0.817*	0.842**	0.990**	0.859**	0.891	0.942**	1.839**	0.520
	(0.475)	(0.424)	(0.387)	(0.420)	(0.541)	(0.372)	(0.771)	(0.397)
TenureGroup	−0.020	0.028	−0.073	−0.080	0.007	−0.054	−0.619	0.356
	(0.265)	(0.283)	(0.226)	(0.245)	(0.213)	(0.215)	(0.375)	(0.265)
Post	−4.832***	−4.792***	−4.929***	−4.961***	−12.815***	−4.813***	−5.626***	−4.507***
	(0.365)	(0.376)	(0.331)	(0.340)	(0.458)	(0.327)	(0.714)	(0.334)
log(GDPpercapita)		0.075	−0.018	−0.056	0.063	0.032	0.421	0.040
		(0.362)	(0.366)	(0.384)	(0.367)	(0.335)	(0.781)	(0.398)
log(Population)		−0.308	−0.178	−0.105	−0.084	−0.119	−0.615	0.245
		(0.266)	(0.271)	(0.313)	(0.273)	(0.248)	(0.492)	(0.302)
log(Distance)		−0.615*	0.036	0.270	−0.206	−0.231	−0.692	0.199
		(0.371)	(0.506)	(0.523)	(0.472)	(0.462)	(0.943)	(0.556)
GovExp		−0.659	−0.283	−1.532	0.576	−0.471	−1.604	3.865*
		(2.158)	(2.151)	(2.262)	(1.946)	(1.948)	(3.955)	(2.242)
Constant	109.324***	115.578***	110.145***	108.139***	111.428***	111.996***	113.919***	104.902***
	(0.437)	(3.751)	(4.565)	(4.916)	(4.385)	(4.188)	(8.267)	(4.665)
Control variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,996	1,878	1,824	1,546	1,150	1,576	750	1,074
R-squared	0.743	0.746	0.785	0.783	0.832	0.712	0.757	0.818

This table reports the estimation results for Equation (2) based on the quarterly data from Q1 2019 to Q4 2020. The standard errors are clustered at city level and reported in parentheses. * significant at 10% level; ** significant at 5% level; *** significant at 1% level.

officials, who were waiting for turnover, their primary goal is to make no mistakes. As a result, they tended to overemphasize the priority target with veto power (epidemic control), even at the expense of the hard target (GDP growth). Overall, the results show that short-tenure city leaders perform better on the economic development target, providing support for Hypothesis 2 (H2).

Table 4. Effects of local officials' age on economic development.

	Baseline regression		Robustness test		Heterogeneity analysis			
Dependent variable	Full Sample GDP growth (1)	Full Sample GDP growth (2)	Without Hubei GDP growth (3)	Without Turnover GDP growth (4)	Before March 25th GDP growth (5)	After March 25th GDP growth (6)	Northern China GDP growth (7)	Southern China GDP growth (8)
AgeGroup×Post	0.031	0.006	−0.051	−0.328	0.204	−0.168	0.313	−0.322
	(0.462)	(0.475)	(0.357)	(0.398)	(0.499)	(0.342)	(0.680)	(0.362)
AgeGroup	−0.306	−0.249	−0.233	−0.160	−0.257	−0.252	0.076	−0.351
	(0.270)	(0.288)	(0.232)	(0.264)	(0.215)	(0.219)	(0.398)	(0.279)
Post	−4.305***	−4.238***	−4.249***	−4.251***	−12.324***	−4.097***	−4.445***	−4.002***
	(0.309)	(0.307)	(0.263)	(0.283)	(0.378)	(0.255)	(0.493)	(0.265)
log(GDPpercapita)		0.048	−0.045	−0.090	0.058	0.000	0.241	0.028
		(0.361)	(0.365)	(0.381)	(0.365)	(0.335)	(0.778)	(0.394)
log(Population)		−0.307	−0.177	−0.111	−0.087	−0.116	−0.601	0.247
		(0.266)	(0.270)	(0.313)	(0.273)	(0.248)	(0.491)	(0.301)
log(Distance)		−0.619*	0.043	0.258	−0.200	−0.228	−0.615	0.192
		(0.370)	(0.506)	(0.522)	(0.472)	(0.462)	(0.951)	(0.560)
GovExp		−0.876	−0.516	−1.793	0.533	−0.744	−2.312	3.680*
		(2.145)	(2.136)	(2.250)	(1.930)	(1.940)	(3.940)	(2.218)
Constant	109.082***	115.435***	109.869***	108.007***	111.313***	111.782***	113.417***	104.750***
	(0.450)	(3.757)	(4.556)	(4.901)	(4.380)	(4.174)	(8.315)	(4.711)
Control variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,996	1,878	1,824	1,546	1,150	1,576	750	1,074
R-squared	0.741	0.745	0.783	0.782	0.831	0.709	0.751	0.817

This table reports the estimation results for Equation (3) based on the quarterly data from Q1 2019 to Q4 2020. The standard errors are clustered at city level and reported in parentheses. * significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Thirdly, we test whether the age of city leaders significantly affects the performance of local economic development. Table 4 presents the estimation results of Equation (3), using quarterly data from Q1 2019 to Q4 2020. Standard errors are clustered at the city level and reported in parentheses. Column (1) and (2) show the baseline regression results. We find that both the coefficient of the DID estimator (*AgeGroup*×*Post*) and the main independent variable (*AgeGroup*) are statistically insignificant. This indicates that there was no significant difference in GDP growth rate between cities led by younger officials and older officials, either before or after the COVID-19 outbreak. Thus, Hypothesis 4 (H4) is not supported by the empirical results. A possible explanation is that age may not directly influence local economic performance but could exert an effect through its interaction with tenure (Zhu et al. 2024). We will conduct further analysis in the heterogeneity analysis section.

Robustness tests

Firstly, to mitigate the potential influence of outliers, we exclude cities in Hubei province – the region most severely affected by COVID-19, accounting for over 70% of confirmed cases in mainland China – and re-estimate Equations (1), (2), and (3). The regression results are reported in Column (3) of Tables 2–4, which are consistent with the baseline results. This indicates that the benchmark regression results are robust.

Secondly, to address potential adverse selection bias, we remove cities that experienced turnover of city leaders in 2020, and re-estimate Equations (1), (2), and (3). The regression results are reported in Column (4) of Tables 2–4, which are substantially similar to the baseline findings.

Heterogeneity analysis

Firstly, we investigate the heterogeneous effects of tenure across different age groups. In the previous baseline regression, the age variable of the city leaders failed the significance test (in Tables 2 and 4). It is worth noting, however, existing literature suggests that age can meaningfully shape the behaviour and promotion incentives of local officials (Huang et al. 2020; Xi, Yao, and Zhang 2018). Specifically, city leaders over the age of 57 are generally considered to have minimal chances of further promotion. To explore this dimension, we follow Zhu et al. (2024) and divide all city leaders into two groups based on whether they were older than 57 years old at the time of the COVID-19 outbreak. We then re-estimate Equation (1) and Equation (2) separately for each group. The regression results are reported in Table 5. We find that for officials aged 57 or below, neither the coefficient of the main independent variable (*TenureGroup*, in Column 1) nor the coefficient of the DID estimator (*TenureGroup*×*Post*, in Column 3) is statistically significant. However, for officials over the age of 57, both the *TenureGroup* and *TenureGroup*×*Post* coefficients are significant at the 1% and 5% levels, respectively. These findings suggest that tenure has a stronger influence on performance among older officials. Specifically, short-tenure leaders over age 57 tend to achieve higher GDP growth but underperform in epidemic control, consistent with differentiated incentive structures near retirement. In contrast, among younger officials, tenure appears to have no significant explanatory power in shaping performance outcomes – possibly due to their uniformly strong promotion motivations regardless of tenure length.

Secondly, we investigate the heterogeneous effects across different time periods. On 25 March 2020, Hubei Province ended its 76-day lockdown, marking a critical turning point in China's COVID-19 response. Prior to this date, the number of confirmed cases in China was rising rapidly, and local governments across China adopted strict measures to prevent the spread of the virus. After 25 March 2020, the epidemic was largely brought under control, and local officials began to shift their attention towards resuming economic activity and relaxing restrictions (Ke and Hsiao 2022). To reflect this policy shift, we divide the epidemic response period into two stages: the tough stage (before 25 March 2020) and the stable stage (after 25 March 2020). We then re-estimate Equations (1), (2), and (3) separately for each stage. In Table 2, Columns (5) and (6) show the regression results for Equation (1), and both are consistent with the baseline findings – promotion incentives do not significantly affect epidemic control performance

Table 5. Heterogeneous effects of tenure across different age groups.

Dependent variable	Age≤57 ECI (1)	Age>57 ECI (2)	Dependent variable	Age≤57 GDP growth (3)	Age>57 GDP growth (4)
TenureGroup	1.328	−12.193***	TenureGroup×Post	0.640	1.279**
	(4.103)	(3.939)		(0.621)	(0.525)
log(GDPpercapita)	−21.407***	−17.238**	TenureGroup	0.584	−0.420
	(5.459)	(8.684)		(0.469)	(0.288)
log(Population)	−13.264***	−19.929***	Post	−4.939***	−4.919***
	(2.983)	(3.649)		(0.545)	(0.431)
Immigration	0.128	−0.516	log(GDPpercapita)	−0.088	0.562
	(0.374)	(0.718)		(0.446)	(0.711)
log(Distance)	14.618*	22.076**	log(Population)	−0.032	−0.391
	(8.014)	(9.592)		(0.362)	(0.325)
GovExp	−13.467	−37.120	log(Distance)	−0.013	0.273
	(28.713)	(55.625)		(0.728)	(0.609)
Import	−26.020	−41.037*	GovExp	−1.271	5.917*
	(23.470)	(23.405)		(3.113)	(3.527)
Constant	58.671	61.586	Constant	109.101***	108.001***
	(68.774)	(86.866)		(5.794)	(5.667)
Control variables	Yes	Yes	Control variables	Yes	Yes
Day fixed effect	Yes	Yes	Day fixed effect	Yes	Yes
Province fixed effect	Yes	Yes	Province fixed effect	Yes	Yes
Observations	1,384	1,247	Observations	891	933
R-squared	0.588	0.521	R-squared	0.792	0.800

The standard errors are clustered at city level and reported in parentheses. * significant at 10% level; ** significant at 5% level; *** significant at 1% level.

in either stage. In Table 3, Columns (5) and (6) report the estimates for Equation (2). The coefficient of the DID estimator (*TenureGroup*×*Post*) is statistically insignificant during the tough stage (Column 5), but becomes significantly positive during the stable stage (Column 6) ($\beta = 0.942$, $p < 0.05$). This suggests that the differential behaviour of short-tenure and long-tenure officials in promoting economic growth only emerges after the epidemic was brought under control. In Table 4, Columns (5) and (6) present the estimates for Equation (3). The results remain consistent with the baseline regression, indicating no significant difference in economic performance between cities led by younger and older officials during either stage. Overall, the heterogeneity analysis reveals that the impact of officials' tenure on economic development performance becomes significant only after the turning point in epidemic control. This is because once the epidemic was largely contained, officials gained greater policy autonomy, making differences in their policy preferences and behaviours more visible.

Thirdly, we investigate the heterogeneous effects across different regions. Due to the imbalanced economic development between northern and southern China, the influence of local officials' promotion incentives may vary by region (Zhu et al. 2024). To address this issue, we divide the full sample into two regional groups – northern and southern cities – and re-estimate Equations (1), (2), and (3) separately for each group. In Table 2, Columns (7) and (8) show the regression results for Equation (1), and both are consistent with the baseline findings. In Table 3, Columns (7) and (8) report the estimates for Equation (2). The coefficient of the DID estimator (*TenureGroup*×*Post*) is statistically insignificant in southern China (Column 8), but becomes significantly positive in northern China (Column 7) ($\beta = 1.839$, $p < 0.05$). This suggests that the differential behaviour between short-tenure and long-tenure officials in promoting economic growth is only evident in northern regions. In Table 4, Columns (7) and (8) present the estimates for Equation (3). The results remain in line with the baseline regression. Our analysis reveals that officials' promotion incentives in the northern region have a more significant impact on local GDP growth compared to those in the southern region. A possible explanation is that southern officials generally place a stronger emphasis on economic development regardless of

tenure, whereas in the north, tenure-related incentives play a more decisive role in driving growth.

V. Conclusion

Local governments are often faced with multiple and potentially competing targets from the central government (Andersen, Boesen, and Pedersen 2016; D. D. Li 2021; P. Zhang 2021). This article contributes to the literature by arguing that local government officials' promotion incentives are crucial determinants in how they prioritize competing targets. Using the COVID-19 outbreak as a quasi-natural experiment, we construct a novel panel dataset covering 278 prefecture-level cities in China to investigate whether city leaders' promotion incentives – measured by tenure and age – affect their performance in epidemic control and economic development. Employing difference-in-differences and fixed effects regressions, we find no significant variation in epidemic control outcomes across officials with different tenures or ages. However, during the COVID-19 epidemic, cities governed by short-tenure leaders experienced a 0.84% point higher GDP growth rate compared to those led by long-tenure officials. Furthermore, the impact of officials' promotion incentives on GDP growth was particularly pronounced among older officials, in northern regions, and after the epidemic was brought under control. These findings suggest that officials with lower promotion incentives are more likely to exhibit distorted behaviour when facing competing policy targets. Even after the nationwide epidemic was brought under control on 25 March 2020, such officials continued to prioritize epidemic control at the expense of local economic growth.

This article may generate two meaningful policy implications. Firstly, setting a clear priority target can serve as an effective governance tool in crisis management. Our findings show that when confronted with a priority target such as epidemic control, all officials – regardless of age or tenure – strive to achieve it without distinction. This implies that in crisis management, raising an issue as a priority target with veto power is an effective way for the central government to mobilize local officials. However, once the crisis subsides, the central government should promptly adjust its priority targets to minimize potential behavioural distortions among local officials. Secondly, the central government should be cautious when introducing competing targets. Our results indicate that officials with different promotion incentives respond differently to the multiple competing targets. In particular, those with lower promotion incentives may overemphasize the priority target (e.g. epidemic control) to demonstrate political correctness, while neglecting the hard target (e.g. GDP growth). Therefore, when implementing competing targets, the central government should carefully consider their potential to distort the performance and incentives of certain local officials.

It is also necessary to discuss the generality of the findings from the following three perspectives. Firstly, while this study focuses on COVID-19, its implications extend beyond the epidemic. As an exogenous shock, the COVID-19 outbreak provides a quasi-natural experiment for examining how local governments respond to multiple, and sometimes competing, policy targets. However, the conclusions are not limited to epidemic response. In practice, local governments frequently encounter situations that require balancing priority targets and hard targets (D. D. Li 2021; P. Zhang 2021). In such contexts, our findings remain relevant. Secondly, while the analysis centres on city leaders, the insights are not confined to them alone. The city leader is the first-highest-ranking official in the city, who is in charge of all local political, social, and economic affairs, including personnel appointments. Consequently, his personal incentives are likely to be transmitted to other local officials (H. Li and Zhou 2005). Examining city leaders' responses to competing targets thus effectively captures the broader behaviour of local officials. Moreover, there is reason to believe that the conclusions would also hold at the county levels, provided relevant data are available. Thirdly, while the study uses China as its context, the relevance extends beyond the Chinese case. Although China's political system is significantly different from Western democratic systems, multi-tasking is a common feature of local governments worldwide (Andersen, Boesen, and Pedersen 2016). The unique institutional arrangement in China provides an ideal context in which to explore how local governments respond to the multiple targets,

but the findings may also offer valuable policy implications for other countries.

It is also worth noting several limitations of this study that warrant attention in future research. Specifically, we use tenure and age as proxies for promotion incentives; however, other factors – such as political networks, historical performance, and personal ability – may also influence such incentives. In addition, due to sample constraints and data availability, there is room to refine variable selection and data processing methods. Future research could expand the sample scope and incorporate cross-country data to further validate and extend the findings of this study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the China Postdoctoral Science Foundation under Grant [No. 2023M742025].

ORCID

Kun Lang http://orcid.org/0000-0002-4205-3616
Alexander X. Li http://orcid.org/0000-0003-1656-8015
Shaobo Long http://orcid.org/0000-0003-4549-8722

Data availability statement

The data used in this article are available upon request from the corresponding author.

References

Adefeso, H. A., and M. O. Muraina. 2024. "Government Policy Interventions During COVID-19 Pandemic and Economic Performance." *International Review of Economics & Finance* 89:683–691. https://doi.org/10.1016/j.iref.2023.07.079.

Allen, D. W. 2022. "COVID-19 Lockdown Cost/Benefits: A Critical Assessment of the Literature." *International Journal of the Economics of Business* 29 (1): 1–32. https://doi.org/10.1080/13571516.2021.1976051.

Andersen, L. B., A. Boesen, and L. H. Pedersen. 2016. "Performance in Public Organizations: Clarifying the Conceptual Space." *Public Administration Review* 76 (6): 852–862. https://doi.org/10.1111/puar.12578.

Besley, T., and A. Case. 1995. "Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits." *Quarterly Journal of Economics* 110 (3): 769–798. https://doi.org/10.2307/2946699.

Chen, J., X. Guo, H. Pan, and S. Zhong. 2021. "What Determines City's Resilience Against Epidemic Outbreak: Evidence from China's Covid-19 Experience." *Sustainable Cities and Society* 70:102892. https://doi.org/10.1016/j.scs.2021.102892.

Chen, Y., G. Z. Jin, N. Kumar, and G. Shi. 2012. "Gaming in Air Pollution Data? Lessons from China." *The BE Journal of Economic Analysis & Policy* 13 (3). https://doi.org/10.1515/1935-1682.3227.

Chen, Y., H. Li, and L. A. Zhou. 2005. "Relative Performance Evaluation and the Turnover of Provincial Leaders in China." *Economics Letters* 88 (3): 421–425. https://doi.org/10.1016/j.econlet.2005.05.003.

Courty, P., and G. Marschke. 2004. "An Empirical Investigation of Gaming Responses to Explicit Performance Incentives." *Journal of Labor Economics* 22 (1): 23–56. https://doi.org/10.1086/380402.

Ding, D., and R. Zhang. 2022. "China's COVID-19 Control Strategy and Its Impact on the Global Pandemic." *Frontiers in Public Health* 10:857003. https://doi.org/10.3389/fpubh.2022.857003.

Edin, M. 2003. "State Capacity and Local Agent Control in China: CCP Cadre Management from a Township Perspective." *China Quarterly* 173:35–52. https://doi.org/10.1017/S0009443903000044.

Gao, J. 2015. "Political Rationality Vs. Technical Rationality in China's target-Based Performance Measurement System: The Case of Social Stability Maintenance." *Policy and Society* 34 (1): 37–48. https://doi.org/10.1016/j.polsoc.2015.03.005.

Geng, S., B. Pang, and L. Zhong. 2016. "The Political Economy of the Term Factor in China: The Term of Local Cadres and the Behavior of Local Governments." *China Economic Quarterly* 15 (3): 893–916. (In Chinese).

Gerrish, E. 2016. "The Impact of Performance Management on Performance in Public Organizations: A Meta-Analysis." *Public Administration Review* 76 (1): 48–66. https://doi.org/10.1111/puar.12433.

Ghanem, D., and J. Zhang. 2014. "'Effortless Perfection': Do Chinese Cities Manipulate Air Pollution Data?" *Journal of Environmental Economics & Management* 68 (2): 203–225. https://doi.org/10.1016/j.jeem.2014.05.003.

Goodman-Bacon, A., and J. Marcus. 2020. "Using Difference-in-Differences to Identify Causal Effects of COVID-19 Policies." *Survey Research Methods* 14 (2): 153–158.

Guo, G. 2009. "China's Local Political Budget Cycles." *American Journal of Political Science* 53 (3): 621–632. https://doi.org/10.1111/j.1540-5907.2009.00390.x.

Hall, J. L., G. Shin, and C. E. Bartels. 2022. "Measuring the Effect of Performance Management in Local Economic Development Policy: The Case of Tax Increment Finance Districts in the Dallas-Ft. Worth Metroplex." *Local*

Government Studies 48 (4): 628–654. https://doi.org/10.1080/03003930.2020.1869544.

Heinrich, C. J. 2002. "Outcomes–Based Performance Management in the Public Sector: Implications for Government Accountability and Effectiveness." *Public Administration Review* 62 (6): 712–725. https://doi.org/10.1111/1540-6210.00253.

Heinrich, C. J., and G. Marschke. 2010. "Incentives and Their Dynamics in Public Sector Performance Management Systems." *Journal of Policy Analysis and Management* 29 (1): 183–208. https://doi.org/10.1002/pam.20484.

Hibbs, D. A. 1977. "Political Parties and Macroeconomic Policy." *The American Political Science Review* 71 (4): 1467–1487. https://doi.org/10.2307/1961490.

Huang, Z., J. Liu, G. Ma, and L. C. Xu. 2020. "The Transformative Effects of Privatization in China: A Natural Experiment Based on Politician Career Concern." *World Bank Policy Research Working Paper No. 9261*. Available at SSRN: https://ssrn.com/abstract=3614142.

Isea, R. 2020. "How Valid Are the Reported Cases of People Infected with COVID-19 in the World?" *International Journal of Coronaviruses* 1 (2): 53–56. https://doi.org/10.14302/issn.2692-1537.ijcv-20-3376.

Jacobsen, C. B., and L. B. Andersen. 2014. "Performance Management in the Public Sector: Does It Decrease or Increase Innovation and Performance?" *International Journal of Public Administration* 37 (14): 1011–1023. https://doi.org/10.1080/01900692.2014.928317.

Jin, H., Y. Qian, and B. R. Weingast. 2005. "Regional Decentralization and Fiscal Incentives: Federalism, Chinese Style." *Journal of Public Economics* 89 (9–10): 1719–1742. https://doi.org/10.1016/j.jpubeco.2004.11.008.

Jing, Y., Y. Cui, and D. Li. 2015. "The Politics of Performance Measurement in China." *Policy and Society* 34 (1): 49–61. https://doi.org/10.1016/j.polsoc.2015.02.001.

Julnes, P. D. L., and M. Holzer. 2001. "Promoting the Utilization of Performance Measures in Public Organizations: An Empirical Study of Factors Affecting Adoption and Implementation." *Public Administration Review* 61 (6): 693–708. https://doi.org/10.1111/0033-3352.00140.

Kalgin, A. 2016. "Implementation of Performance Management in Regional Government in Russia: Evidence of Data Manipulation." *Public Management Review* 18 (1): 110–138. https://doi.org/10.1080/14719037.2014.965271.

Ke, X., and C. Hsiao. 2022. "Economic Impact of the Most Drastic Lockdown During COVID-19 Pandemic—The Experience of Hubei, China." *Journal of Applied Econometrics* 37 (1): 187–209. https://doi.org/10.1002/jae.2871.

Lechner, M. 2011. "The Estimation of Causal Effects by Difference-in-Difference Methods Estimation of Spatial Panels." *Foundations and Trends in Econometrics* 4 (3): 165–224. https://doi.org/10.1561/0800000014.

Leng, A., and H. Lemahieu. 2021. "Covid Performance Index: Deconstructing Pandemic Responses." *Lowy Institute*. Available at: https://interactives.lowyinstitute.org/features/covid-performance/.

Li, D. D. 2021. *Economic Lessons from China's Forty Years of Reform and Opening-Up*. Singapore: Springer.

Li, H., and L. A. Zhou. 2005. "Political Turnover and Economic Performance: The Incentive Role of Personnel Control in China." *Journal of Public Economics* 89 (9–10): 1743–1762. https://doi.org/10.1016/j.jpubeco.2004.06.009.

Li, L. 2011. "The Incentive Role of Creating 'Cities' in China." *China Economic Review* 22 (1): 172–181. https://doi.org/10.1016/j.chieco.2010.12.003.

Li, W., P. Zhang, K. Zhao, and S. Zhao. 2022. "The Geographical Distribution and Influencing Factors of COVID-19 in China." *Tropical Medicine and Infectious Disease* 7 (3): 45. https://doi.org/10.3390/tropicalmed7030045.

Liang, J., and L. Langbein. 2015. "Performance Management, High-Powered Incentives, and Environmental Policies in China." *International Public Management Journal* 18 (3): 346–385. https://doi.org/10.1080/10967494.2015.1043167.

Liu, L. 2020. "Emerging Study on the Transmission of the Novel Coronavirus (COVID-19) from Urban Perspective: Evidence from China." *Cities* 103:102759. https://doi.org/10.1016/j.cities.2020.102759.

Luo, W., and S. Qin. 2021. "China's Local Political Turnover in the Twenty-First Century." *Journal of Chinese Political Science* 26 (4): 651–674. https://doi.org/10.1007/s11366-021-09739-2.

Ma, L. 2016. "Performance Feedback, Government Goal-Setting and Aspiration Level Adaptation: Evidence from Chinese Provinces." *Public Administration* 94 (2): 452–471. https://doi.org/10.1111/padm.12225.

Nordhaus, W. D. 1975. "The Political Business Cycle." *Review of Economic Studies* 42 (2): 169–190. https://doi.org/10.2307/2296528.

Qian, Y., and B. R. Weingast. 1997. "Federalism as a Commitment to Reserving Market Incentives." *Journal of Economic Perspectives* 11 (4): 83–92. https://doi.org/10.1257/jep.11.4.83.

Qiu, Y., X. Chen, and W. Shi. 2020. "Impacts of Social and Economic Factors on the Transmission of Coronavirus Disease 2019 (COVID-19) in China." *Journal of Population Economics* 33 (4): 1127–1172. https://doi.org/10.1007/s00148-020-00778-2.

Ran, R. 2017. "Understanding Blame Politics in China's Decentralized System of Environmental Governance: Actors, Strategies and Context." *China Quarterly* 231:634–661. https://doi.org/10.1017/S0305741017000911.

Rogoff, K., and A. Sibert. 1988. "Elections and Macroeconomic Policy Cycles." *Review of Economic Studies* 55 (1): 1–16. https://doi.org/10.2307/2297526.

Shah, W. U. H., G. Hao, H. Yan, R. Yasmeen, and Y. Jie. 2022a. "The Role of Energy Policy Transition, Regional Energy Efficiency, and Technological Advancement in the Improvement of China's Environmental Quality." *Energy Reports* 8:9846–9857. https://doi.org/10.1016/j.egyr.2022.07.161.

Shah, W. U. H., G. Hao, H. Yan, R. Yasmeen, I. U. H. Padda, and A. Ullah. 2022b. "The Impact of Trade, Financial Development and Government Integrity on Energy Efficiency: An Analysis from G7-Countries." *Energy* 255:124507. https://doi.org/10.1016/j.energy.2022.124507.

Sun, Z., H. Zhang, Y. Yang, H. Wan, and Y. Wang. 2020. "Impacts of Geographic Factors and Population Density on the COVID-19 Spreading Under the Lockdown Policies of China." *Science of the Total Environment* 746:141347. https://doi.org/10.1016/j.scitotenv.2020.141347.

Van Dooren, W., G. Bouckaert, and J. Halligan. 2015. *Performance Management in the Public Sector*. London: Routledge.

Verbeeten, F. H. 2008. "Performance Management Practices in Public Sector Organizations: Impact on Performance." *Accounting Auditing & Accountability Journal* 21 (3): 427–454. https://doi.org/10.1108/09513570810863996.

Wallace, J. L. 2016. "Juking the Stats? Authoritarian Information Problems in China." *British Journal of Political Science* 46 (1): 11–29. https://doi.org/10.1017/S0007123414000106.

Wang, X., and X. Xu. 2008. "Local Officials' Experience, Tenure, and Economic Growth: Evidence from the Governor and Secretary of the Provincial Party Committee in China." *Management World* 24 (3): 16–26. (In Chinese).

Wang, Z., Q. Zhang, and L. A. Zhou. 2020. "Promotion Incentives of City Leaders and Urban Spatial Expansion in China." *Review of Economics and Statistics* 102 (5): 897–911. https://doi.org/10.1162/rest_a_00862.

WHO. 2020. "Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)." Available at: https://www.who.int/publications/i/item/report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-(covid-19).

Xi, T., Y. Yao, and M. Zhang. 2018. "Competence Versus Incentive: Evidence from City Officials in China." *Journal of Comparative Economics* 46 (4): 1046–1061. https://doi.org/10.1016/j.jce.2018.04.001.

Xu, J., and W. Wei. 2021. "The Effects of Tax and Fee Reduction Policy on Mitigating Shock of the COVID-19 Epidemic in China." *Applied Economics* 53 (46): 5303–5318. https://doi.org/10.1080/00036846.2021.1904119.

Yang, K., and J. Y. Hsieh. 2007. "Managerial Effectiveness of Government Performance Measurement: Testing a Middle-Range Model." *Public Administration Review* 67 (5): 861–879. https://doi.org/10.1111/j.1540-6210.2007.00774.x.

Yu, W., and L. Ma. 2015. "External Government Performance Evaluation in China: Evaluating the Evaluations." *Public Performance and Management Review* 39 (1): 144–171. https://doi.org/10.1080/15309576.2016.1071171.

Zha, H., Y. Zhang, H. Zhou, L. Wang, Z. Zhang, Z. Tan, L. Deng, and T. Hale. 2022. "Chinese Provincial Government Responses to COVID-19." *Oxford COVID-19 Government Response Tracker Working Paper Series*.

Zhang, J., and Y. Gao. 2007. "Term Limits and Rotation of Chinese Governors: Do They Matter to Economic Growth?" *Economic Research Journal* 53 (11): 91–103. (In Chinese).

Zhang, P. 2021. "Target Interactions and Target Aspiration Level Adaptation: How Do Government Leaders Tackle the 'Environment-Economy' Nexus?" *Public Administration Review* 81 (2): 220–230. https://doi.org/10.1111/puar.13184.

Zhang, P., and J. Wu. 2020. "Performance Targets, Path Dependence, and Policy Adoption: Evidence from the Adoption of Pollutant Emission Control Policies in Chinese Provinces." *International Public Management Journal* 23 (3): 405–420. https://doi.org/10.1080/10967494.2019.1688209.

Zhu, Q., X. Zou, J. Zhong, F. Gao, Z. Wei, and X. Shi. 2024. "Promotion Incentives, Economic Growth Targets and Industrial Land Supply: Evidence from China." *Applied Economics* 57 (29): 4213–4226.