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Performance target and effort manipulation: The moderating effects of target difficulty and target conflict

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Abstract: This paper examines how target difficulty and target conflict affect the effort manipulation behaviors in a target-based performance management system. The empirical exploration with the "blue-sky day" targets during the 13th Five-Year Plan period (2016-2020) reveals that, for the cities capable of meeting the annual blue-sky day target, more difficult targets are more likely to induce a threshold effect: after achieving the target, air quality deteriorates significantly, and the degree of deterioration increases with the target difficulty. Similarly, for these cities, a larger conflict between the blue-sky day target and economic target leads to more pronounced deterioration in air quality. In contrast, for the cities incapable of achieving the annual blue-sky day target, less challenging targets tend to trigger a storming effect: air quality improves significantly once the cities realize they cannot achieve the annual target, and the degree of improvement increases as target difficulty decreases. However, for these cities, target conflict does not show significant moderating effect on the effort manipulation behavior. These findings indicate that, the extent to which target-setting moderates unethical practices depends on the characteristics of the managed objects. In addition, between the two dimensions of performance targets, target difficulty exerts a stronger influence than target conflict.

Key words: Effort manipulation; target difficulty; target conflict; performance management

1 Introduction

As a core element of new public management reform, performance management has been deemed as a useful tool to enhance transparency, accountability, and organizational learning (Hood and Piotrowska, 2021). However, an increasing amount of evidence has been identified to support the unintended negative consequences of performance management, most notably, gaming (Gao et al., 2021; Chen and Jia, 2022).

Gaming is generally defined as a strategic behavioral response to the implementation of, *inter alia*, target-based performance management (TPM) system (Taylor, 2021a). Public employees who engage in gaming deliberately manipulate their behavior in response to their organization's TPM system in order to give a false impression of heightened performance, which will negatively affect the internal and external public service delivery of the organization (Gao, 2015).

Although there are various forms, gaming behaviors can be summarized into two categories: data manipulation and effort manipulation (Benaine and Kroll, 2020). Data manipulation refers to strategies that elevate the performance numbers on paper without yielding genuine improvement in output, including data distortion and cheating (Christopher and Hood, 2006). Data distortion involves creatively interpreting, reporting, or rearranging data to make them look favorable, while data cheating involves lying or complete fabrication of performance data. Effort manipulation

involves two types: effort reduction and effort substitution (Benaine and Kroll, 2020). Effort reduction means reducing effort without necessarily transferring the effort elsewhere (Bevan and Hood, 2006), which mainly includes ratchet effect (performance restriction due to the expectation of incremental targets), and threshold effect (performance reduction to just meet the target requirement) (Liu and Li, 2024). Effort substitution means more effort and resources are provided to certain indicators at the expense of other indicators, e.g., measured/unmeasured indicators, rewarded/unrewarded indicators, and short-term/long-term indicators (Kelman and Friedman, 2009).

To date, scholars have identified a wide range of factors that contribute to gaming in TPM system, including individual-level personal traits of public managers (e.g., age, gender and motivation) (Anessi-Pessina and Sicilia, 2020; Taylor, 2021b), professional norms (Taylor, 2021a), organizational characteristics and operating environment (e.g., environmental complexity, media scrutiny, and policy regime) (Tan and Rae, 2009; Cohen, 2018; Terman, 2019), and elements of TPM, such as associated incentives (Chen and Jia, 2022), designs of performance measures (Eisenkopf, 2009), and performance feedback (Mizrahi and Minchuk, 2023; Chen, 2025). All these factors rest on the basic assumption that gaming in TPM arises from the pursuit of preset targets. Therefore, targets in TPM should be a prominent factor that exerts influence on gaming strategies. As Wheeler (2000) argued, when people are pressured to meet a target, their behaviour will be altered, and gaming behaviour may ensue.

Existing research has extensively investigated the impact of target on gaming behavior under TPM. Several empirical studies, such as those investigating target-based energy-saving initiatives (Zhang et al., 2021), and economic performance evaluations in China (Gong et al., 2025), have indicated that target setting of TPM could trigger gaming behaviors. Theoretical models linking various characteristics of target-setting and gaming behavior have also been developed (Barsky, 2008; Taylor, 2021b). A number of studies have validated some key propositions from these models. For example, the unreasonable design of targets—characterized by a lack of participative target setting (Ahn et al., 2018), and overly ambitious goals (Terman, 2019)—has been proved to exacerbate data manipulation. In an experiment, Schweitzer et al. (2004) found that participants were more likely to misrepresent their performance level when they had a specific, challenging goal than when they did not, especially when their actual performance level fell just short of reaching the goal. Gao (2010) expanded this discussion by exploring multi-target contexts, revealing that simultaneously meeting incompatible mission and non-mission based targets could also trigger data manipulation. Chen (2025) further indicated that the conflicting goals set by higher authorities amplified the effect of negative performance feedback on local governments' data manipulation. Beyond data manipulation, some studies have started to explore phenomena related to effort manipulation, including effort substitution (Benaine and Kroll, 2020), storming effect (Bevan and Hood, 2006), and target ratcheting (Fisman and Wang, 2017; Cao et al., 2025).

While acknowledging that target-setting in TPM plays a fundamental role in inducing gaming behavior, this paper argues there are three aspects of deficiency in the extant studies: 1) Most of existing analysis on target and gaming behavior investigate the gaming behavior driven by the institutional arrangement of TPM but do not construct a causal link between target value and gaming. 2) Most quantitative studies focus on data manipulation, whereas empirical evidence on effort manipulation remains relatively scarce, although there are several exceptions, e.g., the effort substitution

documented by Benaine andKroll (2020) and the ratchet effect identified by Cao et al. (2025). The scarcity of evidence stems from the difficulty in dynamically monitoring target completion status, which obstructs the compilation of time-series data necessary for quantifying effort-related gaming. 3) Target is a concept involving multi-dimensional properties, but the measurement of target in current research is mainly unidimensional, either taking target as a qualitative factor or using the numerical value of a specific target.

Therefore, this paper decomposes performance target into two fundamental dimensions: target difficulty and target conflict, and explores their impacts on effort manipulation behaviors with the "blue-sky day target" for Chinese municipal governments during the 13th Five-Year Plan (FYP) (2016-2020) as a case.[a]

Since 2006, China's environmental TPM based on FYP has set mandatory targets for local governments. That means accountability for failing to meet targets are clearly defined, ranging from warnings and suspension of local project approvals. Such consequences will negatively affect the political records of local officials, and lead to lower probability for promotion or even direct dismissal. On the other side, the system does not distinguish between cities that fulfill and those that exceed the targets in its reward structure (Zhang, 2021). So, China's environmental TPM is supposed to create a strong incentive for local governments to "just hit the target", which is prone to trigger effort manipulation behavior and provides an opportunity to observe the relationship between performance target and effort manipulation.

Insights from behavioral theories of organizations suggest those exposed to assessment do not always initially have motivation to game the system but end up gaming when specific contextual factors influence their motivation—a mode characterized by Bevan andHood (2006) as "reactive gamers". Facing the blue-sky day target, Cao et al. (2026) found when cities determined they had met the target on one day, i.e., the required minimum number of days with AQI≤100, they tended to relax air quality control after the day, leading to the deterioration of air quality. This phenomenon aligns with the threshold effect observed in gaming behavior. Conversely, when cities recognized that achieving the annual target was no longer possible—due to insufficient remaining days in the year, even under optimal air quality conditions—they would intensify their efforts to improve air quality, striving to improve performance before the year's end. This pattern corresponds to the storming effect in gaming dynamics. Based on the finding of Cao et al. (2026), this study further examines how target difficulty and target conflict affect the effort manipulation behavior, which is expected to deepen the understanding of goal setting in TPM for public sector.

2 Theoretical analysis and hypotheses development

2.1 Target difficulty and effort manipulation

In a TPM system, when the accountability environment is lenient and the target is perceived by the employees in line with their capabilities, the target is more likely to inspire them to work actively. On the contrary, when the employees feel that the performance target exceeds their job responsibilities and ability, they may be reluctant to work actively due to low expectancy perception and the pressure of control and restraint. Moreover, short-term and control-oriented performance accountability shapes a blame culture (Greiling and Halachmi, 2013). This kind of culture associated with the

[a] This target requires a minimum number of days with good or moderate air quality in a year. Air quality is measured by the air quality index (AQI). When AQI≤100, the air quality is good or moderate.

powerful incentive mechanism makes attaining goals as psychological reward (Heath et al., 1999), and therefore, by extension, makes failure to achieve goals as a psychological cost. In some contexts, whether the target is achieved may also be linked with material reward and punishment. Therefore, when the target difficulty requires ability or knowledge that is beyond the employees' current capacity, they may feel falling short of their goals, and would be likely to experience stress, anxiety and pressure (Locke and Latham, 2006), and regard goal setting as a threat rather than a challenge. In this sense, the employees may conduct unethical behaviors to obtain the same psychological and material reward or avoid punishment by focusing on hitting the target while not really improving the performance.

On the other hand, target commitment, as a function of both the expectancy and attractiveness of target attainment, has significant moderating effect on the target–performance relationship (Hollenbeck and Klein, 1987). When there is a high commitment to the target, more difficult target is believed to stimulate better performance (Locke, 1968). However, if the target is perceived to be too difficult, the employees will not be committed to the targets because the expectancy and attractiveness of target attainment will reduce significantly. Thus, they may decrease ethical recognition and increase moral disengagement towards the target, by directing attention away from evaluating the ethics of their behaviours and towards achieving the output (Barsky, 2008).

In the target-based air quality performance management in China, as Liu andLi (2024) suggested, there is an inverted U-shaped relationship between target value and target completion rate. That is, before the turning point, when the target becomes more difficult, local governments will pay more effort because more difficult target indicates stronger determination of higher-level government. However, when the target is perceived by local governments as too difficult to attain, their motivation to realize the target will be reduced due to the deficiency of self-efficacy (Suciu et al., 2013), which will reduce their target commitment and attentional resources (Liu and Li, 2024). Nevertheless, given the existence of accountability pressure, local governments may time their effort to "muddle through" the target by constant readjustments and focusing on short-term gains (Courty and Marschke, 2004; Zhou et al., 2013). Therefore, this paper argues the more difficult is the target, the higher is the possibility for local governments to time their effort allocation to prioritize short-term wins over sustainable effort.

In the context of blue-sky day target, as aforementioned, two types of cities and their effort manipulation behaviour have been identified by Cao et al. (2026): one is compliant city, and the other is non-compliant city. Compliant city means those which achieve the blue-sky day target in a year. When they find they have achieved the annual blue-sky day target on one day, they would allocate less effort in air pollution abatement, leading to the deterioration of air quality after the day (Cao et al., 2026). Non-compliant city means those which do not achieve the blue-sky day target in a year. When they find they could not achieve the annual target on one day, they would allocate more effort to catch up with the target as possible, leading to the improvement of air quality after the day (Cao et al., 2026). Based on the above discussion, this paper argues both effort manipulation behaviours would intensify with the increasing target difficulty and proposes the following two hypotheses:

$H_{1.1}$: For compliant cities, the more difficult is the blue-sky day target, the more significant is the deterioration of air quality after the day when the cities achieve the target.

$H_{1.2}$: For non-compliant cities, the more difficult is the blue-sky day target, the more significant is the improvement of air quality after the day when the cities find they cannot achieve the target.

2.2 Target conflict and effort manipulation

In public sector, employees are often confronted with multiple conflicting targets (Christensen et al., 2019), which have a negative impact on performance outcome (Locke et al., 1994). On the one hand, the more conflicts an employee experiences on a target, the less commitment it makes to that target (Slocum Jr et al., 2002). When employees are confronted with goal conflicts, they may feel at a loss and experience anxiety and stress due to the fear of not being able to meet multiple goals simultaneously, thereby reducing their enthusiasm and commitment to work or even avoiding work (Yip et al., 2020). On the other hand, when the employees encounter conflicts in their goals, they have to make a tradeoff and rationally allocate their efforts to different targets to obtain an optimal performance outcome, e.g., signaling their competence to the superiors by achieving the highest relative performance among peers or improving the organizations' reputation among the stakeholders (Ma, 2016; Holm, 2018). In this process, they often find it difficult to allocate their time and energy reasonably (Chun and Rainey, 2005). This may lead to deviations in their allocation of resources and attention. They may overly focus on one goal while neglecting another, or frequently switch between multiple goals, resulting in a slower work progress, reduced work efficiency, and ultimately bad performance. Facing such situation, the employees may have to time their effort to hit the main target while ignoring the long-term performance improvement. Supposedly, the more serious is target conflict, the higher possibility is such effort manipulation.

Over past three decades, a notable phenomenon is that with the continuous socioeconomic development, Chinese reformers have set an increasing number of performance targets as a means to mandate the implementation of various central policies by local governments. However, there are always conflicts between multiple goals. In Chinese bureaucracy, given limited resources and short tenure time frame for local officials, there is a tendency to direct resources, attention and personnel temporarily to a particular area in response to top pressure, which is often at the expense of overlooking issues in other areas (Chen and Jia, 2021). In the target-based air quality performance management in China, environment-economy conflict is the most salient target conflict faced by local governments. Since the opening and reform in 1978, economic development has been the central task for Chinese local governments. With the increasing environmental pollution triggered by the fast-growing economic scale and economy-centered policy system (Liu and de Jong, 2017; Du and Yi, 2021), the central government has gradually included environmental indicator in measuring local government performance (Liu et al., 2016; Liu et al., 2021). Nevertheless, economic growth is still one of the most important jobs for local governments, which constitutes an environment-economy trade-off in local development (Liu et al., 2020).

Facing the conflict, existing studies commonly suggest local governments tend to avoid the difficult task of pursuing a sustainable and environmentally-friendly path and weaken environmental enforcement and monitoring without alerting the center, like gaming the number (Chen et al., 2013; Eaton and Kostka, 2014), even after the

introduction of mandatory environmental targets since the 11th FYP. Therefore, when economic goals conflict with environmental mandates, local governments might reduce their efforts to improve environmental performance. However, since environmental targets are mandatory, they may strategically exert just the minimum necessary effort to meet them.

Similar with the impact of target difficulty, in the context of blue-sky day target, this paper argues both effort manipulation behaviours would intensify with increasing target conflict and proposes the following two hypotheses:

$H_{2.1}$: For compliant cities, the more serious is the conflict between blue-sky day target and economic target, the more significant is the deterioration of air quality after the day when the cities achieve the annual blue-sky day target.

$H_{2.2}$: For non-compliant cities, the more serious is the conflict between blue-sky day target and economic target, the more significant is the improvement of air quality after the day when the cities realize they cannot achieve the annual blue-sky day target.

3 Empirical research design

3.1 Models and variables

Building on the methodology of Cao et al. (2026), who demonstrated a significant shift in air quality once local governments realize they have either already met their target or are certain to fail, this paper introduces a regression discontinuity design (RDD) with interaction terms to investigate the effects of target difficulty and target conflict on these behaviors.

Following the suggestion of Hausman andRapson (2018), this paper implements the RDD in two steps. In the first step, as shown in Eq. (1), the full sample is used to regress the air quality against the control variables and fixed effects to purify the dependent variable:

$$AQI_{idmy} = \beta_0 + \beta X_{idmy} + \lambda_i + \delta_d + \eta_m + \mu_y + \varepsilon_{idmy} \tag{1}$$

where AQI_{idmy} is the AQI of city *i* on day *d* of month *m* in year *t*, X_{idmy} are control variables reflecting daily weather condition, including average temperature, wind speed, temperature inversion and rainfall. λ_i and δ_d are respectively city fixed effects and time fixed effects. In addition, η_m and μ_y, respectively denoting month and year fixed effects, are also controlled, given air quality has significant seasonal characteristics and is affected by the annual socioeconomic development characteristics. ε_{idmy} is the random error.

In the second step, the residual of the above regression, $RAQI_{idmy}$ is used as the dependent variable for the RDD estimations in Eq. (2) and Eq. (3).

$$\begin{aligned} RAQI_{idmy} = {} & a_0 + a_1 D_{idmy} + a_2 D_{idmy} \times Target_diff_{iy} + a_3 Target_diff_{iy} \\ & + f(r_{idmy}) + D_{idmy} \times f(r_{idmy}) + Target_diff_{iy} \times f(r_{idmy}) \\ & + a_4 Target_conf_{iy} + a_5 X_{idmy} + \lambda_i + \delta_d + \eta_m + \mu_y + \xi_{idmy} \end{aligned} \tag{2}$$

$$\begin{aligned} RAQI_{idmy} = {} & b_0 + b_1 D_{idmy} + b_2 D_{idmy} \times Target_conf_{iy} + b_3 Target_conf_{iy} \\ & + f(r_{idmy}) + D_{idmy} \times f(r_{idmy}) + Target_conf_{iy} \times f(r_{idmy}) \\ & + b_4 Target_diff_{iy} + b_5 X_{idmy} + \lambda_i + \delta_d + \eta_m + \mu_y + \psi_{idmy} \end{aligned} \tag{3}$$

Eq. (2) is used to estimate the moderating effect of target difficulty, and Eq. (3) is used to estimate the moderating effect of target conflict. In local polynomial regression, first-order and second-order models are typically preferred, because employing higher-order polynomials in RDD can introduce substantial limitations, including reduced estimate stability and compromised interpretability (Gelman and Imbens, 2019). So, Eq. (2) and Eq. (3) are estimated with first-order polynomial in main regression and second-order polynomial in robustness test, respectively.

The blue-sky day targets for each city are made by their provincial governments. Due to variations in provincial environmental management systems, as well as differences in socioeconomic development levels and environmental governance capacities across cities, it is unreasonable to assess the difficulty of their blue-sky day targets by directly comparing the numerical values. When setting targets for cities, the provincial government must ensure that the sum of each city's target aligns with the overall provincial goal. At the same time, the provincial government must endeavor to ensure the equitable distribution of targets among cities, keeping the effort required to meet them within an attainable range for each. Against this backdrop, this paper measures target difficulty of city *i* as the difference between the blue-sky day target of city *i* and the average of all the cities in the same province. For each city, the higher is its target than the provincial average, the more difficult is the target, and *vice versa*.

Target conflict is measured by the difference between the economic target of city *i* and the average economic target of all the cities in the same province. As aforementioned, economy-environment tradeoff is the most prominent conflict in China's local development. Environmental regulation often conflicts with economic development, as it may raise production costs for firms, reduce output, increase prices, and ultimately slow income growth and deter new investment (Liu and Li, 2024). Local policymakers thus face difficult trade-offs between environmental protection and economic growth, especially both objectives are now prioritized by the central government. Therefore, for each city, the higher is its economic target than the provincial average, the more difficult is the economic target, which means a larger conflict between economic target and blue-sky day target, and *vice versa*.

In both Eq. (2) and Eq. (3), r_{idmy} is the running variable denoting the number of days relative to the threshold, and the negative/positive sign represents the day before/after the threshold. For compliant cities, the threshold is the day when they find they have achieved the annual blue-sky day target; while for non-compliant cities, the threshold is the day when they find they would not achieve the target till the year end. D_{itmy} is a dummy variable indicating post/pre the threshold, which equals to 1 if $r_{idmy}>0$ and 0 otherwise. $f(r_{idmy})$ is a polynomial function of the running variable and its interaction with D_{idmy} allows for distinctive trends of the outcome variable on different sides of the threshold.

More importantly, considering both target difficulty and target conflict may affect the air quality, we control target conflict when estimating the effect of target difficulty in Eq. (2). In the same way, we control target difficulty in Eq. (3).

Table 1 shows the main variables' specification and corresponding data source.

Table 1 The variables specification

Variable		Unit	Description	Data source
Dependent variable	AQI_{idmy}	/	Air Quality Index	China National Environmental Monitoring Centre
Independent variables	D_{idmy}	/	Treatment status, equal to 1 if D_{itd} >0 and 0 otherwise.	Information disclosure application to local governments China City Statistical Yearbook Annual Statistical Bulletin of Economic and Social Development for each city
	$Target_Diff_{iy}$	/	Difference between the annual blue-sky day target of city *i* and the average target of all the cities in the same province	
	$Target_Conf_{iy}$	/	Difference between the annual economic target of city *i* and the average economic target of all the cities in the same province	
Control variables	*Temp*	℃	Daily average temperature	http:// lishi.tianqi.com/
	Rain	mm	Daily rainfall	https://rp5.ru/
	Wind	m/s	Daily average wind speed	
	Temp_Inv	℃/100 m	Daily average temperature inversion	Modern-Era Retrospective analysis for Research and Applications version 2 (MERRA-2)

3.2 Samples

This paper collects data for 234 municipalities during the 13th FYP period (2016-2020), which account for over 80% of China's total. Based on the above theoretical hypotheses, the effort manipulation behaviours for compliant and non-compliant cities are different. So, as shown in Figure 1, according to whether the city achieves the annual blue-sky day target, this paper divides the cities into compliant sample and non-compliant sample, and respectively constructs daily panel dataset.

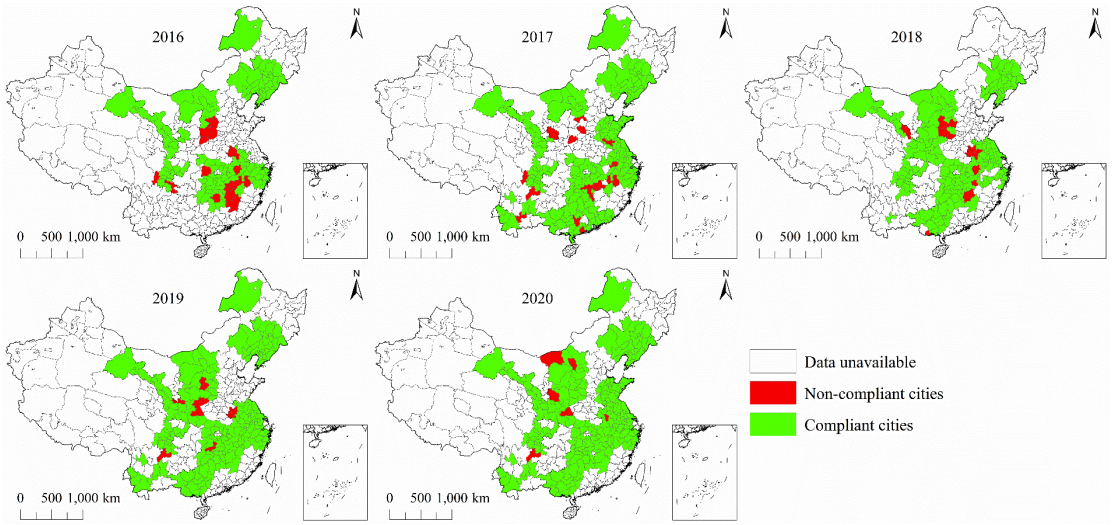


Figure 1 Geographical distribution of the sample

4 Results

4.1 Descriptive statistics

Table 2 shows the descriptive statistics of the main variables. Accordingly, during the 13th FYP period, the number of cities achieving the blue-sky day targets significantly outweigh those that failed, indicating the TPM with binding environmental targets promoted most local governments to comply. However, there were still about 17% of the cities could not achieve the target, indicating the complexity of local governments' behavior in top-down goal-setting.

Table 2 Descriptive statistics of variables

	Variables	City	Obs.	Mean	SD	Min	Max
Compliant cities	*AQI*	211	288,841	65.95	35.54	9.814	496.7
	D_{idmy}	211	288,841	0.115	0.319	0	1
	$Target_diff_{iy}$	211	288,841	-0.407	19.73	-76.59	104.4
	$Target_conf_{iy}$	211	288,841	0.000	0.680	-3.273	4.273
	Rain	211	288,841	3.015	7.869	0	149.3
	Wind	211	288,841	2.171	0.852	0.405	7.997
	Temp	211	288,841	14.70	10.71	-32.23	34.51
	Temp_Inv	211	288,841	0.181	0.443	0	9.316
Non-compliant cities	*AQI*	43	25,568	79.96	44.09	13.07	496.3
	D_{idmy}	43	25,568	0.137	0.344	0	1
	$Target_diff_{iy}$	43	25,568	3.641	16.40	-33.70	65.12
	$Target_conf_{iy}$	43	25,568	-0.020	0.716	-2.563	2.273
	Rain	43	25,568	3.011	7.632	0	173.4
	Wind	43	25,568	2.044	0.731	0.411	7.265
	Temp	43	25,568	15.23	9.629	-22.14	33.43
	Temp_Inv	43	25,568	0.160	0.351	0	4.252

Note: The total number of cities does not match the figure of 234 introduced in section 3.2 because the air quality

in some cities met the targets in certain years but failed in others.

For compliant cities, the average value of treatment variable D_{idmy} is 0.115, indicating that the number of days before the threshold is substantially higher than that after it. As shown in Figure 2(a), this pattern suggests that the target attainment was concentrated near the end of the year, since most cities were required to maintain blue-sky days for over 70% of the year—equivalent to more than 256 days. Therefore, the scope for effort manipulation was largely confined to the latter part of the year.

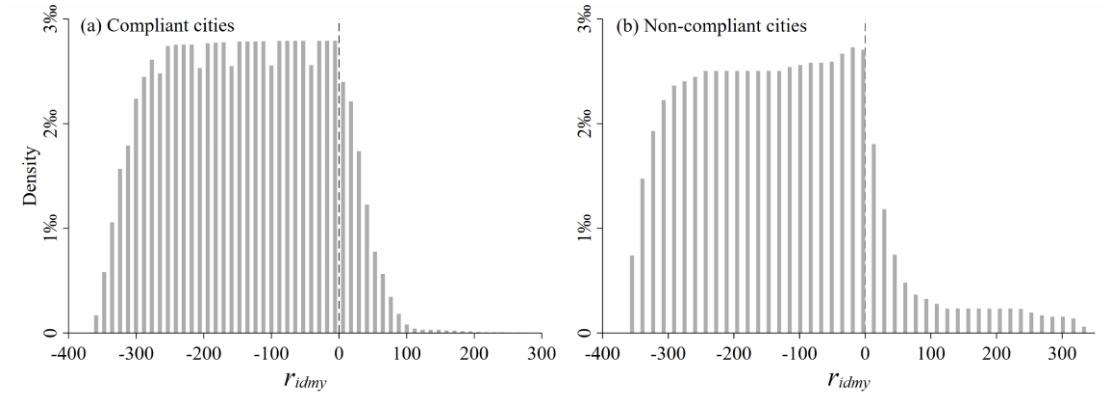


Figure 2 The distribution the running variable (r_{idmy})

For non-compliant cities, the average value of treatment variable D_{idmy} is 0.137, indicating that the number of days before the threshold is substantially higher than that after it. As shown in Figure 2 (b), this pattern suggests that the failure of these cities to meet the targets was mainly concentrated toward the end of the year. It can be inferred that some efforts were made intermittently to improve air quality earlier in the year. However, due to inherent weaknesses in environmental governance capacity, these cities ultimately fell short of the target as they approached the end of the year. Consequently, after the threshold, they may resort to last-minute and intensive measures to meet the targets as much as possible.

Moreover, Figure 3 plots and fits the daily AQI of compliant and non-compliant cities before and after the threshold day. As shown in Figure 3(a), for the compliant cities, after the day when the cities achieve the blue-sky day target, the AQI shows a significant upward jump, indicating the deterioration of air quality. As shown in Figure 3(b), for the non-complaint cities, after the day when the cities find they would not achieve the target till the year end, the AQI shows a discontinuous decline, indicating the improvement of air quality. Consistent with the finding of Cao et al. (2026), for both compliant and non-compliant cities, there exist obvious cutoff in the daily air quality change.

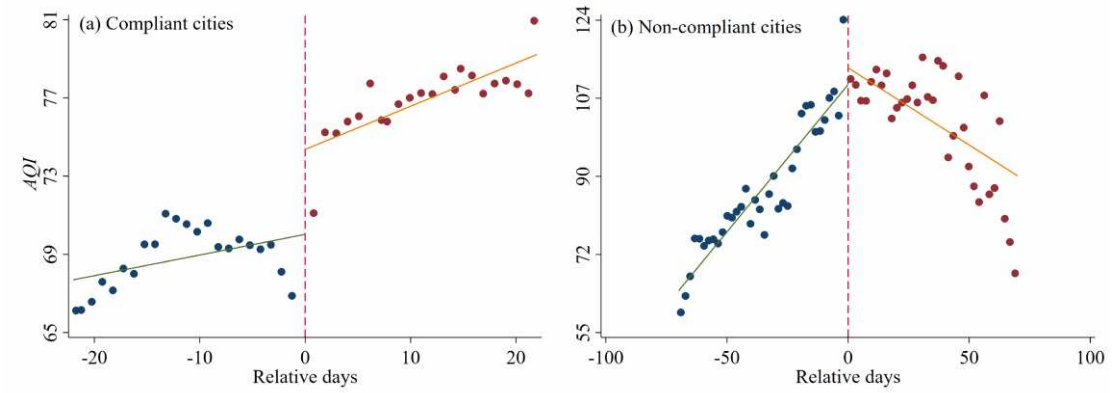


Figure 3 The AQI before and after the threshold day

4.2 Moderating effect of target difficulty

4.2.1 Compliant cities

Table 3 shows the estimation result of Eq. (2) for compliant cities. As shown in column (1), the coefficient of $D_{idmy} \times Target_Diff_{iy}$ is 0.107 and significant at 1% level. From column (2) to column (6), when gradually adding control variables, the coefficient of $D_{idmy} \times Target_Diff_{iy}$ keeps significantly positive. The result indicates that the target difficulty positively moderates the relationship between AQI and D_{idmy}. The result means, as shown in Figure 4, the more difficult is the target, the more significant is the deterioration of air quality after the day when the cities achieve the annual blue-sky day target.

$H_{1.1}$ is thus accepted.

Table 3 The moderating effect of target difficulty for compliant cities

	(1)	(2)	(3)	(4)	(5)	(6)
D_{idmy}	3.569***	3.570***	3.422***	3.330***	3.224***	3.218***
	(0.612)	(0.612)	(0.608)	(0.606)	(0.597)	(0.596)
$D_{idmy} \times Target_Diff_{iy}$	0.107***	0.107***	0.109***	0.110***	0.094***	0.095***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.029)	(0.029)
r_{idmy}	-0.318***	-0.318***	-0.313***	-0.306***	-0.305***	-0.310***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
$D_{idmy} \times r_{idmy}$	0.242***	0.242***	0.236***	0.227***	0.226***	0.221***
	(0.049)	(0.049)	(0.049)	(0.049)	(0.048)	(0.048)
$Target_Diff_{iy} \times r_{idmy}$	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Target_Diff_{iy}$	-0.027	-0.028	-0.039	-0.040	-0.002	0.002
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.030)
$Target_Conf_{iy}$		0.196	0.081	0.064	0.245	0.188
		(0.326)	(0.324)	(0.324)	(0.320)	(0.319)
$Rain$			-0.798***	-0.721***	-0.559***	-0.574***
			(0.058)	(0.057)	(0.051)	(0.052)
$Wind$				-2.589***	-1.365***	-1.435***
				(0.291)	(0.290)	(0.289)
$Temp$					1.670***	1.785***
					(0.053)	(0.053)
$Temp_Inv$						-3.902***
						(0.373)
N	32487	32487	32487	32487	32487	32487
R^2	0.079	0.079	0.091	0.095	0.127	0.131
Day FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth (days)	22					

Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

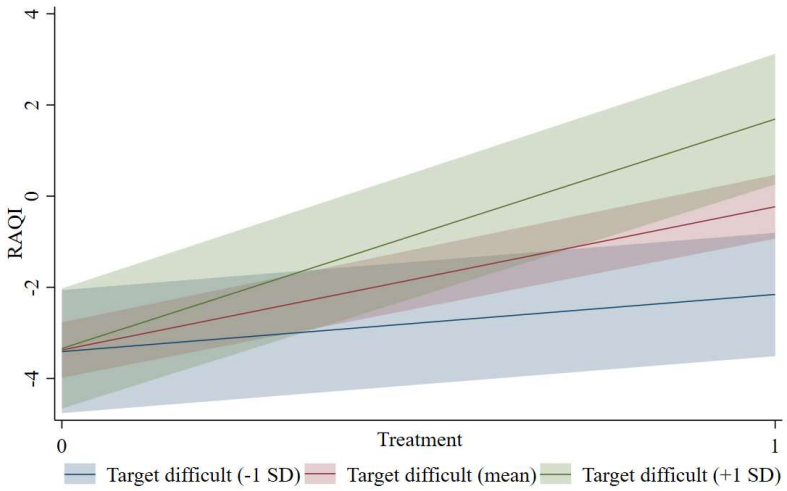


Figure 4 The moderating effect of target difficult for compliant cities

4.2.2 Non-compliant cities

Table 4 shows the estimation result of Eq. (2) for non-complaint cities. As shown in column (1), the coefficient of $D_{idmy} \times Target_Diff_{iy}$ is 0.145 and significant at 10% level. From column (2) to column (6), when gradually adding control variables, the coefficient of $D_{idmy} \times Target_Diff_{iy}$ keeps significantly positive. The result indicates that target difficulty positively moderates the relationship between AQI and D_{idmy}. The result means, as shown in Figure 5, the more difficult is the target, the less improvement of air quality after the day when the cities find they would not achieve the annual blue-sky day target.

$H_{1.2}$ is thus rejected.

The results indicate that, even when achieving the targets ultimately appears unlikely, the prevalence of short-term air pollution mitigation efforts still depends on the difficulty of those targets. A less stringent target is more likely to motivate local governments to narrow the performance gap, as lower difficulty reduces the cost of action and enhances the visibility of their efforts. Conversely, a more challenging target diminishes the incentive for local governments to strive toward attainment, due to lower cost-effectiveness.

Table 4 The moderating effect of target difficulty for non-compliant cities

	(1)	(2)	(3)	(4)	(5)	(6)
D_{idmy}	-2.566	-2.516	-2.716	-2.546	-2.898	-2.891
	(2.081)	(2.076)	(2.065)	(2.058)	(2.026)	(2.027)
$D_{idmy} \times Target_Diff_{iy}$	0.145*	0.152*	0.162*	0.163**	0.174**	0.174**
	(0.083)	(0.083)	(0.083)	(0.083)	(0.082)	(0.082)
r_{idmy}	0.080**	0.087**	0.078**	0.076**	0.071**	0.071**
	(0.036)	(0.036)	(0.035)	(0.035)	(0.035)	(0.035)
$D_{idmy} \times r_{idmy}$	-0.107*	-0.111*	-0.117*	-0.108*	-0.073	-0.073
	(0.062)	(0.062)	(0.062)	(0.062)	(0.061)	(0.061)
$Target_Diff_{iy} \times r_{idmy}$	-0.006***	-0.006***	-0.006***	-0.006***	-0.007***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Target_Diff_{iy}$	-0.135	-0.032	-0.025	-0.033	-0.048	-0.047
	(0.130)	(0.137)	(0.136)	(0.136)	(0.135)	(0.135)
$Target_Conf_{iy}$		7.323***	6.875***	6.481***	6.761***	6.765***
		(2.069)	(2.051)	(2.047)	(2.039)	(2.039)
$Rain$			-0.821***	-0.788***	-0.565***	-0.564***
			(0.074)	(0.074)	(0.073)	(0.074)
$Wind$				-3.070***	-1.753**	-1.757**
				(0.813)	(0.818)	(0.820)

Temp					2.189***	2.182***
					(0.162)	(0.168)
Temp_Inv						0.225
						(1.474)
N	6760	6760	6760	6760	6760	6760
R^2	0.083	0.086	0.100	0.102	0.125	0.125
Day FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth (days)				70		

Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

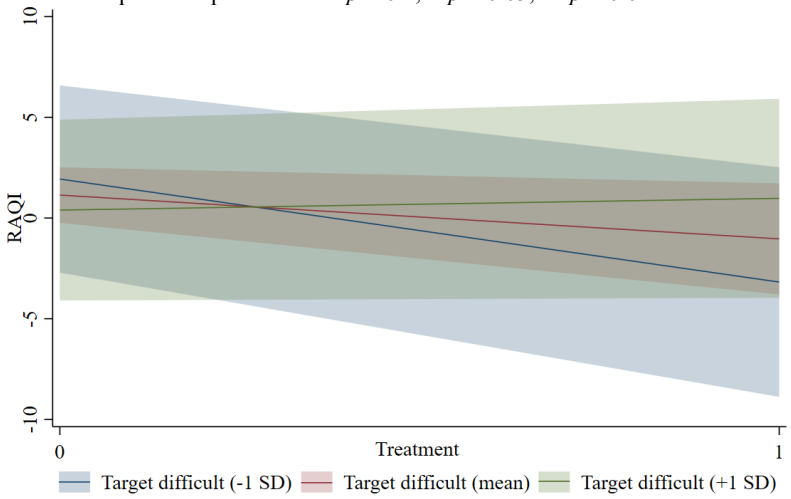


Figure 5 The moderating effect of target difficult for non-compliant cities

4.3 Moderating effect of target conflict

4.3.1 Compliant cities

Table 5 shows the estimation result of Eq. (3) for compliant cities. According to column (1), the coefficient of $D_{idmy} \times Target_Conf_{iy}$ is 1.949 and significant at 10% level. From column (2) to column (6), when gradually adding control variables, the coefficient of $D_{idmy} \times Target_Conf_{iy}$ keeps positive and significant above 10% level. The result suggests that target conflict positively moderates the relationship between *AQI* and D_{idmy}. This means, as shown in Figure 6, for compliant cities, the greater is the conflict between blue-sky day target and economic target, the more significant is the air quality deterioration after they achieve the annual blue-sky day target.

$H_{2.1}$ is thus accepted.

Table 5 The moderating effect of target conflict for compliant cities

	(1)	(2)	(3)	(4)	(5)	(6)
D_{idmy}	3.495***	3.494***	3.346***	3.253***	3.158***	3.151***
	(0.612)	(0.612)	(0.608)	(0.606)	(0.597)	(0.595)
$D_{idmy} \times Target_Conf_{iy}$	1.949**	1.948**	2.034**	2.149**	1.622*	1.600*
	(0.881)	(0.881)	(0.873)	(0.873)	(0.870)	(0.868)
r_{idmy}	-0.321***	-0.315***	-0.310***	-0.304***	-0.303***	-0.308***
	(0.032)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
$D_{idmy} \times r_{idmy}$	0.251***	0.251***	0.245***	0.236***	0.233***	0.228***
	(0.049)	(0.049)	(0.049)	(0.049)	(0.048)	(0.048)
$Target_Conf_{iy} \times r_{idmy}$	-0.047	-0.047	-0.048	-0.050	-0.036	-0.038
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
$Target_Conf_{iy}$	-0.717	-0.739	-0.894	-0.966*	-0.529	-0.580
	(0.551)	(0.552)	(0.548)	(0.546)	(0.537)	(0.536)
$Target_Diff_{iy}$		0.029	0.019	0.018	0.047*	0.052*
		(0.028)	(0.028)	(0.028)	(0.027)	(0.027)

Rain			-0.798***	-0.721***	-0.559***	-0.574***
			(0.058)	(0.057)	(0.051)	(0.052)
Wind				-2.598***	-1.371***	-1.441***
				(0.291)	(0.290)	(0.289)
Temp					1.671***	1.786***
					(0.053)	(0.053)
Temp_Inv						-3.898***
						(0.373)
N	32487	32487	32487	32487	32487	32487
R^2	0.078	0.078	0.091	0.094	0.127	0.130
Day FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth (days)				22		

Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

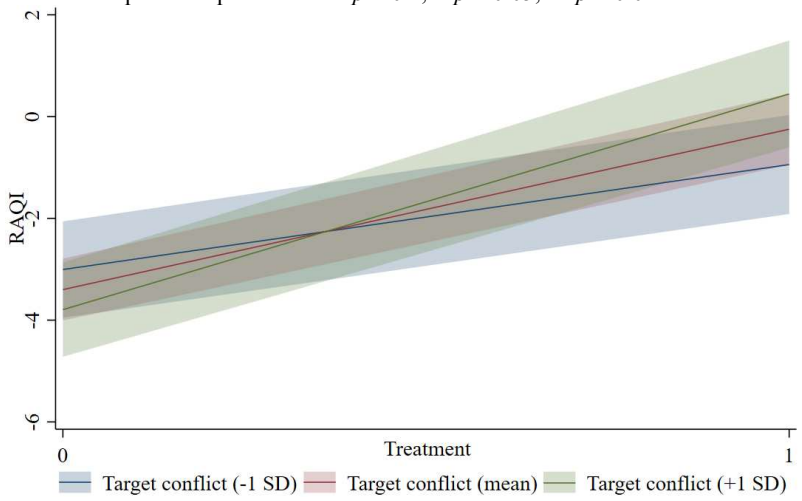


Figure 6 The moderating effect of target conflict for compliant cities

4.3.2 Non-compliant cities

Table 6 shows the estimation result of Eq. (3) for non-compliant cities. According to column (1), the coefficient of $D_{idmy} \times Target_Conf_{iy}$ is -1.129 but insignificant at 10% level. From column (2) to column (6), when gradually adding control variables, the coefficient of $D_{idmy} \times Target_Conf_{iy}$ keeps insignificant. The result suggests that target conflict has no moderating effect for the relationship between AQI and D_{idmy}, namely the storming effect. That means, no matter how large the conflict between blue-sky day target and economic target is, the cities' air quality will significantly improve after the threshold day.

$H_{2.2}$ is thus rejected.

This phenomenon indicates that target conflict is not the factor influencing local governments' storming strategy. When they recognize that their air quality falls below the aspirational level set by assigned targets, they direct greater attention and resources to close this gap, regardless of the conflict between economic target and blue-sky day target.

Table 6 The moderating effect of target conflict for non-compliant cities

	(1)	(2)	(3)	(4)	(5)	(6)
D_{idmy}	-2.140	-2.129	-2.298	-2.132	-2.490	-2.486
	(1.975)	(1.974)	(1.963)	(1.957)	(1.927)	(1.927)
$D_{idmy} \times Target_Conf_{iy}$	-1.129	-1.191	-1.294	-1.261	-1.613	-1.619
	(2.819)	(2.821)	(2.799)	(2.789)	(2.741)	(2.748)
r_{idmy}	0.038	0.033	0.026	0.024	0.014	0.014

	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
$D_{idmy} \times r_{idmy}$	-0.103	-0.103	-0.110*	-0.100	-0.065	-0.066
	(0.063)	(0.063)	(0.062)	(0.062)	(0.061)	(0.061)
$Target_Conf_{iy} \times r_{idmy}$	0.003	0.001	0.006	0.006	0.019	0.019
	(0.035)	(0.035)	(0.035)	(0.035)	(0.034)	(0.034)
$Target_Conf_{iy}$	6.955***	7.504***	7.192***	6.796***	7.432***	7.437***
	(2.340)	(2.449)	(2.431)	(2.420)	(2.399)	(2.402)
$Target_Diff_{iy}$		0.177	0.183	0.177	0.184	0.185
		(0.131)	(0.130)	(0.130)	(0.129)	(0.129)
Rain			-0.825***	-0.793***	-0.576***	-0.576***
			(0.075)	(0.075)	(0.074)	(0.074)
Wind				-3.019***	-1.728**	-1.730**
				(0.815)	(0.819)	(0.821)
Temp					2.137***	2.133***
					(0.162)	(0.167)
Temp_Inv						0.161
						(1.482)
N	6760	6760	6760	6760	6760	6760
R^2	0.082	0.082	0.096	0.099	0.121	0.121
Day FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth (days)	70					

Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.4 Robustness tests

4.4.1 Changing bandwidth

The validity of RDD is highly sensitive to bandwidth. While narrower bandwidths help ensure the unbiasedness of local linear regression, they also tend to increase estimation variance. Conversely, as the bandwidth expands, regression results may become unstable or inconsistent. Therefore, this section re-estimates the baseline models with bandwidths iteratively reduced or increased by 10 days (Lee and Lemieux, 2010). According to the results in Table A1 in the Appendix, for compliant cities, both the coefficients of $D_{idmy} \times Target_Diff_{iy}$ and $D_{idmy} \times Target_Conf_{iy}$ keep positive under different bandwidths, although the significance levels show some variation. According to the results in Table A2 in the Appendix, for non-compliant cities, the coefficients of $D_{idmy} \times Target_Diff_{iy}$ keep positive under different bandwidths and significant under most bandwidths. The coefficients of $D_{idmy} \times Target_Conf_{iy}$ keep insignificant. The results are basically consistent with the baseline regression results.

4.4.2 Changing polynomial degrees

This section estimates the models proposed in section 3.1 with second-order polynomial. According to the results in Table A3 in the Appendix, the coefficient of $D_{idmy} \times Target_Diff_{iy}$ for non-compliant cities becomes statistically insignificant, but remains positive. This may be attributed to the relatively small sample size of non-compliant cities, which increases the risk of overfitting when using a second-order polynomial. Apart from this exception, all the other coefficients of $D_{idmy} \times Target_Diff_{iy}$ and $D_{idmy} \times Target_Conf_{iy}$ keep consistent with those in the baseline regressions. Overall, the original results keep robust after changing polynomial degrees.

4.4.3 Reconstructing moderating variables

Target difficulty and target conflict are the key explanatory variables in this research. This section reconstructs the two variables to check the robustness of the explanatory mechanism. Specifically, $Target_Diff_{iy}$ *is* changed to $Target_Diff_Rate_{iy}$ by

dividing $Target_Diff_{iy}$ by the average blue-sky day target of all the cities in the same province, and $Target_Conf_{iy}$ is changed to $Target_Conf_Rate_{iy}$ by dividing $Target_Conf_{iy}$ by the average economic target of all the cities in the same province. As shown in Table A4 in the Appendix, the coefficients of $D_{idmy} \times Target_Diff_Rate_{iy}$ and $D_{idmy} \times Target_Conf_Rate_{iy}$ are all consistent with the baseline results.

5 Conclusion and discussion

Understanding the causes of public organizations' gaming behaviors in TPM is of great theoretical and practical importance (Taylor, 2021a). A crucial avenue to delving into this question is to treat targets in the performance management system itself as an explanation and investigate how different dimensions of targets affect gaming strategies. Building upon the research of Cao et al. (2026), which found the effort manipulation behavior of Chinese municipal governments under the blue-sky day target during the 13th FYP period, this paper explores how target difficulty and target conflict exert impact on local governments' tendencies to engage in gaming strategies.

The main findings are summarized as the following two-fold:

1) For the cities capable of realizing the annual blue-sky day target, more challenging policy target is more likely to induce "threshold effect". That is, the air quality of the cities significantly deteriorates after achieving the target, and the degree of deterioration increases with target difficulty. A more difficult target means a more non-supportive perception for local governments, which need to invest more resources to achieve the target. The bigger pressure from failing to meet the target is also likely to more negatively affect local governments' loyalty and enthusiasm towards the target. As such, once achieving the minimum requirement, local governments would reduce resource investment in air quality management to a larger degree, which in turn leads to more significant deterioration of air quality.

Similarly, the more serious is the conflict between blue-sky day target and economic target, the more significant is the air quality deterioration after achieving the blue-sky day target. When the conflict is more serious, the pressure and difficulty for local governments to achieve blue-sky day target is larger. Therefore, the cities tend to relieve the pressure more quickly after the minimum number of blue-sky days being achieved (Cao et al., 2025).

2) For the cities incapable of realizing the annual blue-sky day target, less challenging policy target is more likely to induce "storming effect". That is, the air quality of the cities significantly improves after the day when they find they cannot achieve the annual target, and the degree of improvement increases/decreases with decreasing/increasing target difficulty. When the target is easier, their motivation to adopt short-term rush behavior to approach the target requirement will be stronger. On the contrary, if the target is more difficult, the cities will be more reluctant to improve air quality, because more difficult target would, to a larger degree, impair the target commitment and attentional resources of local leaders by reducing their confidence in attaining the target and causing stress, anxiety, complaint, and even discontent (Liu and Li, 2024).

However, for these cities, the conflict between blue-sky day target and economic target has no moderating effect for the storming effect. That is, regardless of the economic development pressure, when these governments recognize their inability to achieve the blue-sky day target, they engage in short-term storming strategy.

Due to the pronounced negativity bias inherent in external accountability environments (Nielsen and Baekgaard, 2015), avoiding or minimizing blame is considered a stronger driver of government behavior than pursuing or maximizing credit (Weaver, 1986). This tendency is especially evident when public organizations are evaluated against quantified performance targets set by higher-level authorities, which clearly delineate success and shortfall (Chen and Jia, 2021). Accordingly, when performance falls below the aspiration level, local governments are expected to prioritize that target and allocate more attention and resources to close the gap and avoid blame.

Nevertheless, this study reveals that such responses by local governments remain influenced by the perceived difficulty of the targets. One plausible explanation is that in cities inherently unable to meet blue-sky day targets, the subjective perception of target difficulty is more immediate and tangible, whereas the perception of target conflict remains indirect and vague. Moreover, it may be precisely because, these cities prioritize economic development when confronted with target conflict. So, once aware of their inability to meet the blue-sky day target, they may no longer focus on target conflict but instead shift attention to remedial actions.

The main contributions of this study lie in three aspects:

1) By tracking local governments' annual target completion status on a daily basis, this paper responds to the call by Murdoch et al. (2023) to incorporate temporal dynamics into understanding the logic of gaming behavior. Not only local governments will employ different effort manipulation strategy according to their target completion status over time, but also the intensity of the strategy depends on the target property. This finding indicates that gaming can serve as a form of constant readjustment to adapt to the system configuration of performance management, rather than necessarily being a predetermined tactic for self-benefits.

2) This paper provides more concrete empirical evidence to explain the effect of target-setting on organizational performance. Liu andLi (2024) has acknowledged the dark side of target-setting, suggesting that the incentive tied to such practice does not necessarily lead to linear improvement in organizational performance but will diminish it when the target is over difficult and faces conflicting target. This paper provides empirical evidence for explaining the phenomenon by demonstrating that target-setting can stimulate and moderate organizational effort manipulation, which reveals the demotivating process of targets (Ordóñez et al., 2009).

3) This paper identifies the heterogeneous effects of different dimensions of performance target on different forms of effort manipulation. Specifically, both target difficulty and target conflict have a more significant impact on exacerbating the threshold effect than on the storming effect. Cities capable of achieving performance target take threshold strategy in response to both target difficulty and target conflict, while cities incapable of achieving performance target take storming strategy only in response to target difficulty. Although the conclusions require some nuance due to the limited number of cities that failed to meet annual targets, the findings indicate two key points: first, the extent to which target-setting moderates unethical practices depends on the characteristics of the managed objects; and second, between the two dimensions of targets, target difficulty exerts a stronger influence than target conflict.

At last, this research provides important insights for public practitioners to optimize the application of target-setting as a means to implement organizational policy.

1) For subordinates that are capable or willing to achieve the targets, overly difficult targets may be counterproductive in the long run. The harder a target is to reach, the more likely these subordinates are to relax or reduce efforts after achieving it, which undermines sustained progress. To prevent this, target system must balance ambition with sustainability, prioritizing long-term outcome over one-time achievement. Emphasis should be placed on motivating yet responsible targets that promote continuous engagement and institutional integrity.

2) For underperforming or reluctant subordinates, setting overly ambitious targets can be demotivating and often leads to disengagement. The more challenging is the target, the more likely these subordinates are to become frustrated and abandon efforts entirely, perpetuating a cycle of poor performance and weak accountability. To break this cycle, it is essential to first strengthen the focus on performance evaluation—clarifying expectations, reinforcing accountability, and aligning incentives—to build a foundation of commitment. Subsequently, targets should be set incrementally based on historical performance, establishing realistic milestones that promote competence, confidence, and sustainable improvement over time.

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