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# Unveiling the origins of non-performance-oriented behavior in China's local governments: a game theory perspective on the performance-based promotion system

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Performance evaluation has great potential to encourage government officials to improve their behavior (performance-oriented government behavior, POGB), but it also tends to lead to behaviors that are detrimental to government performance (non-performance-oriented government behavior, NPOGB). The latter behaviors are prevalent in many parts of the world, especially in areas with fiscal federalist characteristics such as China. This study analyzes POGB and NPOGB and employs game theory to develop a theoretical model to explain the causes of NPOGBs in China, exploring how competition among different jurisdictions leads to them. The findings show that (1) POGB is a condition of Pareto optimality in government behavior, but only represents a very small share of all government behaviors. The majority of behaviors can be categorized as NPOGBs. (2) The primary reason continuous and volatile NPOGBs persist is that, from the perspective of local officials operating under the constraints of information scarcity and risk aversion, they are rational choices, and officials have to imitate one another's behaviors so as not to be defeated in the competition with others.

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## Introduction

Since the end of the 1970s, China's economic development has undergone rapid and unprecedented growth, characterized by impressive increases in gross domestic product (GDP), foreign trade, and foreign direct investment. The remarkable changes witnessed in China often referred to as the "China miracle" (Lin, 1997), have been attributed to the adoption of market-oriented economic policies and the governance approach employed by the Chinese government (Johnson, 1999).

As the rise of the Reinventing Government movement in the 1980s saw the adoption of performance evaluation (PE) as an administrative tool for measuring and improving government performance (Osborne and Gaebler, 1992; Courty and Marschke, 2007). The Chinese government, in part influenced by the New Public Management movement in Western countries, also adopted PE as an integral part of the administrative system reform in the 1980s. Under the PE framework, selection criteria for local government officials in China underwent a transformation, gradually shifting from a focus on political loyalty—encapsulated in the adage "being red and expert"—to a greater emphasis on achieving high levels of economic performance, as evidenced by GDP growth and enhanced productivity (Wu and Wang, 2013; Huang and Wiebrecht, 2021). As noted by Napoleoni (2011), China's performance-based promotion system served to incentivize local governments to prioritize economic development, thereby playing a pivotal role in fueling the country's impressive economic growth. In the present study, we refer to this form of governmental behavior as performance-oriented governmental behavior (POGB).

The adoption of PE within China's public sector has resulted in significant economic achievements. However, it has also raised concerns regarding certain "dark sides" such as income inequality, environmental degradation, and collusion between government and business (Chen and Fleisher, 1996; Démurger, 2001; Zhou, 2010).

Among these "dark sides", the issue of redundant infrastructure and industry construction stands out as a particularly significant concern. In the 1980s, the textile, bicycle, sewing machine, and wristwatch manufacturing industries were repeatedly developed in different regions. In the 1990s, a significant proportion of resources was devoted to the construction of airport infrastructure. According to a reputable media source in China, an airport situated in Jiangxi province was decommissioned after operating for a single year, while over 90% of other airports suffered from financial deficits. The Pearl River Delta region exemplified an even more pronounced manifestation of such excessive expansionist efforts, as evidenced by the simultaneous pursuit of expansion initiatives by all seven airports situated within a 150 km radius of one another.<sup>1</sup> In recent times, the proliferation of redundant construction endeavors has intensified, particularly within sectors such as new energy automotive, subway construction, and telecommunication tower infrastructure.<sup>2</sup> This pattern of recurring and superfluous projects has emerged, precipitating the inefficient allocation of public resources. The rise of new energy automotive technologies has spurred significant economic activity, prompting local governments to offer subsidies to attract corporate investment. In China, sales of new energy passenger vehicles surged to 7.254 million units in 2023, a 38.6% increase from the previous year.<sup>3</sup> Even regions with less developed automotive industries are now considering ways to support this sector's growth. This growth has led to quick market entries and unnecessary infrastructural development in the new energy automotive industry. Despite some major cities needing subway systems to ease traffic congestion, smaller municipalities often lack such a need, yet they may pursue subway construction due to competition among local administrations. This trend

reflects broader patterns where the desire for development parity and competitive status may lead to actions not always aligned with practical needs.

The phenomenon of repeated construction gives rise to a perplexing puzzle. The adoption of policies is a complex process that is influenced by a multitude of local conditions and external factors (Berry and Berry, 1999; Shipan and Volden, 2006). However, China, being a country with a vast land area, is characterized by highly heterogeneous local conditions. This presents a challenge for local governments as they attempt to issue similar policies or projects despite the significant differences among localities, not to mention which may lead to potential negative impacts on their respective economic performance. How can local governments reconcile these differences to reach this seemingly coincident consistency in policy adoption? Why do local governments in China, despite their active pursuit of economic growth and engagement in POGBs, demonstrate suboptimal efficiency in their decision-making and planning processes? What motivates these local governments to engage in behaviors, which we classify as non-performance-oriented governmental behaviors (NPOGBs), that could ultimately impede their performance outcomes and lead to resource waste?<sup>4</sup>

Considerable attention has been given to the prevalence of such NPOGBs among Chinese local governments, which have been described as downsides of performance-oriented behavior (Greasley et al., 2011), unintended-consequence behaviors (Faria, 1997; Newberry, 2002; Etherington and Jones, 2004), non-purposive behaviors (Yu et al., 2011), non-task-based behavior (Rosenbloom and Hahm, 2010; Xu et al., 2013), or game behaviors (Fuchs and Skrzypacz, 2015; Wang et al., 2015). While some observers have provided possible explanations through the perspective of central-local relations, official-citizen relations (Landry, 2008), or the calculated rational behaviors of local government officials (Lin and Li, 2016; Song and Zhuang, 2016), there remains a dearth of comprehensive academic research on this topic. This has led to NPOGBs being inadequately explored. Considering the adverse effects of such behaviors, it is imperative to conduct further investigations.

This study aims to investigate the behaviors of China's local government in the context of PE. Specifically, it seeks to achieve three objectives. Firstly, through a comprehensive literature review and in-depth theoretical analysis, this study distinguishes POGBs from NPOGBs and provides clear definitions of both concepts. Secondly, by employing game theory, this study develops a theoretical model to uncover the causes and explore the characteristics and incentive mechanisms behind NPOGBs under the adoption of PE in public sectors. Lastly, practical policy suggestions are proposed to eradicate or at least minimize NPOGBs.

In contrast to prior characterizations of NPOGBs and their associated negative outcomes as inadvertent by-products or "systematic errors" (Norman and Delfin, 2012), this study contends that NPOGBs are deliberate "man-made mistakes" perpetrated by local officials. Drawing on the rational choice assumption, this research posits that local governmental officials, functioning as "rational actors," may exhibit tendencies to engage in conduct that favors their self-interest over governmental efficacy. As such, they may prioritize personal gain over the performance of their public duties, leading to NPOGBs.

The utilization of game theory in investigating the actions of governmental bodies and authorities has emphasized the importance of comprehending NPOGBs, as elucidated by Yang (2014), Hopland (2015), and González Peña (2018). However, scant attention has been directed towards the determinants of NPOGBs incorporation within a performance-driven promotion

framework. In this regard, this study makes a significant contribution to the study of governmental conduct, with the expectation of illuminating the political and administrative reasoning underpinning governmental determinations and public policies, especially the phenomenon of NPOGBs.

### Two sides of China miracle

In the 1980s, the New Public Management movement brought PE to public attention, and it was widely adopted in the public sector (Osborne and Gaebler, 1992). PE quantifies the work of the government and develops quantitative indicators to evaluate the economy, effectiveness, and efficiency of the government (Mihaiu et al., 2010; Yuan, 2019). Various empirical studies have confirmed that the reasonable use of PE can significantly improve work quality in the public sector, enhance government accountability, and prevent bureaucratization and procedural formalism (Sanderson, 2001; Johansson and Siverbo, 2009).

However, whatever its record of success in the private sector may be, PE is not a panacea for the public sector. Numerous research studies have observed that PE possesses significant potential for motivating governments to improve and attain superior performance through the adoption of performance-oriented government behaviors POGBs. However, these studies also indicate that PE can trigger behaviors that are incongruous with, or in extreme cases, actively opposed to the objectives and aspirations of government performance, which we refer to as non-performance-oriented government behaviors (NPOGBs).

### The bright side of performance evaluation in public sectors.

In recent years, there has been a notable surge in the quantity of scholarly inquiries about government performance evaluation (PE). These investigations have predominantly emphasized the potential of PE mechanisms in enhancing the quality of government operations, as well as the strategic incentives they may provide to public officials (Li et al., 2016; Chen et al., 2017). Notably, the existing literature can be categorized into three prevalent streams based on the vantage point from which government performance is evaluated: the perspective of results, the perspective of behavior, and the perspective of competency.

The perspective of results, as espoused by extant literature, maintains that performance is the expected outcome a government aims to achieve (Bouckaert, 1993; Balaguer-Colla et al., 2007). According to Eccles (1991), performance refers to the effective outcomes of a specific work activity within a designated timeframe. Hence, government performance can be defined as the effective outcomes of government activity during a particular period (Yang and Hsieh, 2007; Anna, 2011; Carassus et al., 2014; Mopene et al., 2020). The achievement of effective outcomes is expected to be facilitated in any feasible way to attain overall administrative goals. Therefore, POGBs are those behaviors that result in positive outcomes and achieve government performance objectives (Kroll and Moynihan, 2015). Given that outcomes can be objectively quantified using specific measures (Pollit and Bouckaert, 2004; Yang, 2012), this strand of literature has garnered significant attention both in academic and practical circles.

The behavior-centered perspective of research asserts that government performance is shaped by all governmental behaviors (Van de Walle and Van Dooren, 2008). Building on the notion that a government's performance is an outcome of its bureaucratic behaviors, several scholars concur that government performance is a function of the value of such behaviors and that behaviors engender performance (Davis and Hayes, 1993; Barrick et al., 2001). Stated differently, the behavior-oriented stream of research accentuates the impact of behaviors on the

attainment of favorable outcomes. Proponents of the behavior theory describe POGBs as those active governmental behaviors that engender effective performance.

The competency perspective emphasizes that the performance of a manager is determined by his or her competencies (Fang and Layraman, 2022; Shang and Yu, 2013; Spencer and Spencer, 1993). The concept of competency was originally introduced in the managerial context to distinguish superior from average managerial performance (Wickramasinghe and Zoyza, 2008). This perspective underscores the importance of capable members in organizations to achieve high performance (Quinn et al., 2003). Within the field of political science, Simonton (2006), Immelman (1998), and Steinberg (2005) have demonstrated that competent public leaders can enhance government performance. Accordingly, governments with high performance are those that have capable public employees and officials (Shang Jin and Liu, 2016), while the term POGB refers to the behaviors of competent civil servants and officials (Dunoon, 2002).

While scant literature has explicitly conceptualized performance-oriented governmental behaviors (POGBs), extant scholarship examining the behavioral ramifications of government performance evaluation has made preliminary inroads in unraveling diverse facets of POGBs. By integrating the perspectives of results, behavior, and competency, we may glean useful insights into the nature of POGBs, as these lenses converge in recognizing the positive outcomes of performance evaluation on government behavior. This study aims to synthesize insights from these three perspectives and proffer a comprehensive account of POGBs.

**The dark side of China's miracle.** While the dominant perspective in China's studies lauds its economic performance, certain scholars recognize that local governments retain significant motivations for participating in NPOGBs. One of the most prevalent challenges arising from NPOGBs in China is the issue of duplicated construction. Repetitive projects are executed in various locations, leading to the development of severe industry homogenization in adjacent regions or even nationwide.

The phenomenon of redundant or repeated construction can be traced back to the 1980s, during which scholars noted a pattern of public investments that were heavily concentrated in specific industries, such as color televisions, refrigerators, electric fans, and washing machines (Wei, 2003). This concentration occurred irrespective of the resources, economic conditions, or market demands of the local region. The situation worsened in the 1990s as local governments engaged in a race to develop the machinery, electronics, and heavy chemical industries. These local governments prioritized these industries and their related counterparts without considering whether such development was appropriate for their respective regions. Consequently, according to the National Bureau of Statistics (NBS, 1996), 24 provinces listed the automobile industry as their primary industry, while 20 provinces identified the machinery industry as their primary industry. Additionally, 26 provinces chose electronics, and 18 chose metallurgical industries for this purpose. The significant construction and investment in these industries were driven by competitive incentives, wherein local governments sought to allocate resources to pursue any opportunities that arose on the market, regardless of their comparative disadvantages (Liu and Li, 2016).

Redundant construction remains a prevalent issue in China's local government projects today. Even e-government systems suffer from this issue (Li and Tian, 2011). Smart cities, which rely on e-government systems, are believed to hold the potential to address urban issues and promote sustainable development (Lee

and Lee, 2014). Chinese local governments have enthusiastically embraced this concept since the early 2000s, with one news agency reporting 386 smart city projects completed by the end of 2015 (Chinese Market Survey Team, 2016). This trend has been observed in all provincial and vice-provincial-level cities in China, as well as 74% of prefecture-level cities (Chinese Market Survey Team, 2016). However, this enthusiasm for smart cities has led to negative consequences and resulted in substantial waste (Zhang, 2012). Most of the construction of smart cities lacks consideration for local problems and is developed without a clear plan. Consequently, these e-government websites are neither well-used nor well-maintained, and the phenomenon of isolated information islands becomes more severe (Li and Ma, 2015). Furthermore, redundant construction has escalated into overlapping construction in some cities, with parallel e-government systems running without necessary interaction (Chinese Market Survey Team, 2016). As a result, most of these websites and portals fail to provide convenience to citizens and represent a significant waste of public resources.

### Extant literature on China's NPOGBs

The counterproductive behaviors of local governments, or NPOGBs as defined in this research, have captured the attention of researchers in the fields of politics, economics, and public administration. Diverse scholarly investigations have yielded varying explanations for the distortion in governmental behavior, depending on the researchers' academic backgrounds and research perspectives. However, most of these explanations are premised on the assumption of a principal-agent relationship between different vertical levels of government (Chen and Liu, 2011). Overall, target deviation resulting from three perspectives—fiscal decentralization, inadequate incentive mechanisms, and inter-jurisdiction competitions—is among the prevailing explanations posited for counterproductive government behavior.

Firstly, several studies have explored the relationship between fiscal decentralization and government behavior, with attributing irrational actions to the tax-sharing reform system (Lee et al., 2015; Ding et al., 2019). The underlying theory suggests that local governments aim to maximize the overall social output and welfare of their jurisdiction (Walker and Wu, 2010). However, in practice, the system of "fiscal federalism" fails to provide local governments with sufficient incentives to prioritize the overall welfare of society as a whole (Ong, 2012). Instead, local governments and officials tend to prioritize their interests, such as increasing local revenues and inflating their GDP, rather than pursuing efficient allocation and free circulation of resources to promote long-term social welfare. This indifference to the long-term welfare of citizens often results in officials selectively achieving performance targets during their tenure at the expense of the overall social output (Sorens, 2014).

Secondly, while studies on fiscal decentralization often attribute NPOGBs to institutional deficiencies, research on incentive mechanisms highlights the distortion of the principal-agent relationship between upper and lower levels of government as a key factor (Young, 2000; Murphy and Li, 2015; Yu and Ma, 2015). In the vertical political principal-agent relationship, the central government must establish compensation incentives to motivate the local governments to perform efficiently. However, financial constraints limit the effectiveness of monetary incentives in motivating lower officials (Courty and Marschke, 2000). As a result, non-monetary remuneration, such as promotions based on local officials' economic performance, is often used to encourage compliance with the principal's objectives (Li et al., 2016). This incentive mechanism tends to prioritize economic development as the clear political objective, but it also leads officials to

prioritize their personal gain and career advancement over achieving real economic development and increasing people's well-being. Consequently, the incentive mechanism becomes incompatible with the ultimate policy objective, reducing its effectiveness (Liu and Li, 2016). Officials tend to engage in distorted behaviors to achieve their personal goals and political objectives.

Lastly, inter-jurisdiction competition also partially explains the behavior of local governmental officials. Under China's centralized and unitary political system, the logic of local governmental officials will follow two theories: the theory of political-championship and the theory of resource competition.

Scholars who adopt the political-championship perspective therefore argue that local officials, who are political actors subject to both political and economic competition with their peers in other jurisdictions, have a strong incentive to accelerate economic growth to obtain promotions and lack incentives to cooperate. When higher authorities use economic performance to evaluate and promote subordinate officials, local officials may act as "political men" under the pressure of horizontal competition (Zhou, 2007; Walker and Wu, 2010). Similarly, jurisdictions with better economic performance may be granted more tangible or intangible resources (Wang, 2010). The more resources a local government has, the greater its competitive advantages. This model emphasizes that local officials make great efforts to compete for production factors and pay attention to fostering and cultivating industrial competitiveness (Ma, 2014). Unfortunately, this mode tends to bring out opportunistic, even selfish behaviors (Murphy and Li, 2015).

Consequently, the dual-competition model generates significant intergovernmental competition. While this perspective has played a positive role in introducing the competition mechanism between local governments and promoting local economic development, it also tends to result in a zero-sum mentality that induces short-sighted behaviors, such as redundant construction and excessive investments (Liu, 2008; Chen and Liu, 2011).

**Limits of current studies.** Extant research contributes to our comprehension of the conduct of local governments in China, particularly those actions that result in adverse outcomes. Nevertheless, it is imperative to acknowledge that these theories are not immune to limitations and there is still considerable disagreement among researchers regarding how to explain counterproductive government behaviors.

Firstly, while studies on fiscal decentralization provide an institutional context for understanding the impact of transferring fiscal responsibilities and resources from central to local governments, they may not offer a comprehensive explanation of local government behavior at the micro-level. Examining local political dynamics, community interests, and individual motivations of local officials is often necessary to fully understand the complex and nuanced decisions and actions of local governments. Therefore, while studies on fiscal decentralization are valuable, they may not be sufficient to fully explain local governmental behavior from a micro-perspective.

Secondly, the limited explanatory power of market and fiscal incentives for negative behaviors, such as repeated unnecessary construction by local governments has also been highlighted in the literature (Zhou, 2004; Murphy and Li, 2015). While studies that adopt an incentive theory perspective provide insight into the negative impact of incentive incompatibility and external incentive failure on government behavior, they may overlook the restraining and corrective influence of the political and administrative systems on local government behavior (Brown, 2008). Consequently, a more comprehensive approach is required



to gain a deeper understanding of the factors that shape local government behavior.

Lastly, research examining the political nature of governments' economic behaviors as a component of government competition theory offers a persuasive approach to comprehending counter-productive governmental actions (So, 2014). Nonetheless, the inquiry into why local officials engage in actions that compromise the welfare of their constituents remains unresolved.

**Game theory analysis of Chinese local government behavior**

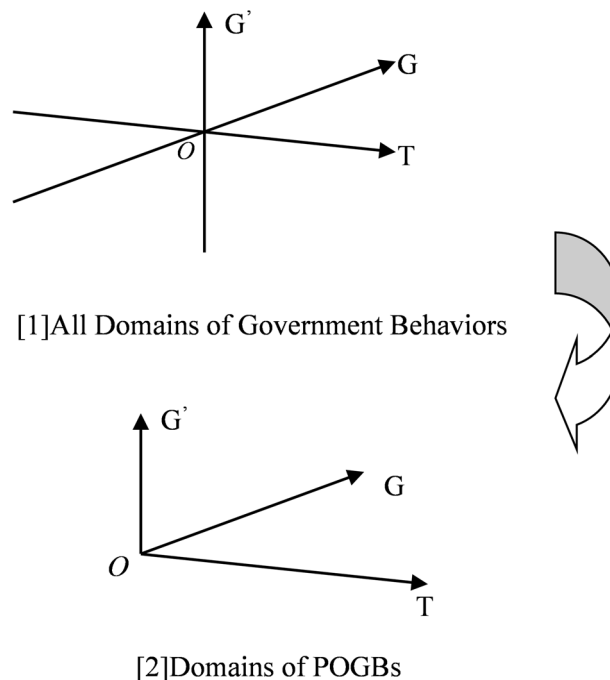
To develop a theoretical explanation for the spread of NPOGBs in China, this study employs the theoretical deduction method. The theoretical deduction method employs a conceptual model as a tool to analyze research objects, and the hypotheses are embedded in the conceptual model as theoretical premises (Fararo and Skvoretz, 1986). In this research, a two-step deductive strategy is adopted. Firstly, a theoretical conceptual model of POGBs and NPOGBs is built. Secondly, game theory is utilized to develop a theoretical model that explains the causes of NPOGBs. Furthermore, the incentive mechanism and characteristics of NPOGBs in China are explored.

**Conceptual model of POGB and NPOGB.** As previously mentioned, this study utilizes the term POGBs to describe positive government behaviors. POGBs refer to behaviors that do not have a negative influence on the focal government jurisdiction or other areas. Conversely, this study defines negative behaviors as NPOGBs. In essence, POGBs refer to actions taken by a government to improve conditions or aspects of conditions in its jurisdiction while keeping the conditions in other jurisdictions unchanged. This definition departs from the earlier research paradigm of performance for its own sake, instead emphasizing performance improvement compared to the past (Yu and Ma, 2015). Furthermore, this definition emphasizes that performance improvement within one jurisdiction should not come at the expense of others, embodying the concept of Pareto optimality in government behaviors (Arrow and Lind, 2014).

It is important to acknowledge that POGBs represent a process of governing that possesses a certain degree of sustaining force, regardless of whether they are attributed to results, behavior, or competency. Nevertheless, it is essential to recognize that POGBs have a geographical boundary. Actors, regardless of whether they cooperate with or compete against each other, make decisions on an individual basis, and POGBs are relevant within their specific jurisdictions.

These characteristics can be visually represented using a quadrant diagram (see Fig. 1[1], [2]). In [1], the starting point for a government's activities is denoted by 0, which also serves as the boundary point between positive and negative results. The area above point 0 represents the positive pole, while the area below it represents the negative pole. The movement towards the positive pole indicates an improvement in governmental performance. For quantifiable performance, the positive result is expressed as an increase in quantity, while for performance that cannot be quantified, the positive result is expressed as an improvement in quality or situation. Conversely, movement towards the negative pole represents a decrease and deterioration in performance. G represents the activities carried out by a specific government, while G' represents the activities of any other government. T denotes time.

When considering time, the activities of a specific government, and the activities of all other governments, they form an integrated space that encompasses all domains of governmental behavior. Within this space, there exist both POGBs and NPOGBs. In [2], the behaviors of a given government (G) result



**Fig. 1 The relationship between all domains of governmental behaviors and POGBs.** [1] depicts government behavior spanning all domains. [2] depicts POGBs constituting only a positive aspect. The picture illustrates that government behavior spans all domains, with POGBs constituting only a positive aspect.

in positive performance and do not impede other governments (G') from improving their performance, achieving Pareto optimality in government competition. In this situation, all behaviors are classified as POGBs, and competition among local governments should be promoted.

As illustrated in Fig. 1, POGBs represent only a small portion of all possible governmental behaviors, providing an ideal direction for government administration. The majority of behaviors fall into the domain of NPOGBs (Shang, 2007). It is worth emphasizing that on certain occasions, public officials in a jurisdiction knowingly engage in NPOGBs, despite being aware that these behaviors undermine public interest, public welfare, and long-term performance objectives.

By emphasizing this point, we are making a novel claim that differs from previous studies on government performance. Prior research has suggested that when government officials take certain actions to achieve performance objectives, there may be drawbacks, unintended consequences, and even non-task-oriented results (Etherington and Jones, 2004; Xu et al., 2013). These unintended, unwanted, or unpurposeful behaviors are adverse effects of the pursuit of government performance (Fuchs and Skrzypacz, 2015; Wang et al., 2015). In the pursuit of performance, one must accept these adverse consequences (Newberry and Susan, 2002). However, previous studies have failed to differentiate between unintended negative government behaviors and those that are intended (Fuchs and Skrzypacz, 2015). Our POGB-NPOGB dichotomy conceptual model addresses this gap in the literature.

In our conceptual model, POGBs are intentional government actions taken to achieve performance goals while being consistent with the citizens' needs. On the other hand, NPOGBs are intentional government actions that go against the citizens' needs, and they can harm government performance objectives and the public welfare.

There are some similarities between the NPOGBs proposed in this study and the unintended negative behaviors discussed in

earlier research, as both types of behaviors result in unfavorable consequences. However, earlier studies have suggested that negative governmental behaviors are a result of bounded rationality, uncertainty, and complexity without intention, and can only be corrected after the fact as a type of unavoidable “systematic error” (Norman and Delfin, 2012; Yi et al., 2016). In contrast, our conceptual model asserts that counterproductive behaviors are attributable to human agency. Government officials who engage in NPOGBs prioritize their self-interest by pursuing higher positions and more power, intentionally ignoring performance goals.

This paper utilizes game theory to provide a detailed analysis of the characteristics and underlying reasons for NPOGBs in China. As Dolan and Galizzi (2015) noted, no behavior can be analyzed in isolation, and game theory has proven to be an effective tool for understanding how governments handle public issues and for elucidating the tournaments or competitions for promotion within and between government organizations (Arad and Rubinstein, 2013; Qiu and Wang, 2013; Chen et al., 2017). The ability of the game theory to explain individual competitive behavior has been recognized by numerous scholars in the fields of economics, politics, and public management (Zhou, 2004; Zhou et al., 2012; Aisbett and McAusland, 2013; Gu, 2014). Lazear and Rosen (1981) used game theory to develop a tournament model that analyzed compensation schemes based on an individual’s ordinal rank within an organization, rather than his or her output level. They found that, under certain circumstances, a compensation system based on relative position within an organization is a more natural and preferred system than one based on the absolute level of performance. Coram (2001) extended this work to analyze the competition between local governments. Zhou (2004) further developed this line of research and utilized game theory to investigate the effect of promotion incentives on local officials in China. Zhou’s model revealed that political tournaments created conflicts of interest among local officials, which he identified as the underlying cause of irrational government behaviors.

The present discourse acknowledges the seminal contribution of Zhou’s model in facilitating a comprehensive comprehension of the political underpinnings of government economic behavior. Nonetheless, it is imperative to note that Zhou’s research did not provide a lucid explication of governmental actions that deviate from performance objectives, particularly within the performance-based political promotion framework.

To delve deeper into the underlying factors that lead to non-performance-oriented governmental behaviors in the context of a performance-based promotion institutional framework, this study endeavors to extend the existing research by formalizing the deliberative “herd behaviors” of China’s local governments. This research is based on three fundamental observations. Firstly, local officials engage in political tournaments to secure higher positions and therefore tend to compete against each other, leading to a focus on outperforming rivals rather than specific performance targets. Moreover, the actions of each individual are influenced by the choices made by their rivals. Secondly, China’s promotion tournament is characterized by both symmetric and asymmetric features, with the latter encompassing idiosyncratic risks and information asymmetry. As such, it is necessary to analyze the behavioral strategies of local governments under conditions of information restriction and risk aversion. Thirdly, to illustrate the detrimental behavioral outcomes of the performance-based promotion system, it is crucial to comprehend its operational mechanics (Cai, 2004). Game theory provides a suitable analytical framework to account for all three observations.

**A game theory explanation of NPOGBs in China’s performance-based promotion system.** According to Liu’s

(2006) perspective, the primary function of China’s central government is to encourage local governments to advance their economic, social, political, and cultural harmony or to optimize their performance. In the context of performance-oriented governmental behaviors, local governments wield significant control over local resources (Horii, 2007; Jimenez, 2019). It is through its officials that the government executes its functions. Nevertheless, these officials are also motivated by self-interest, as they strive to obtain the highest possible political position within the bureaucracy. In China, this pursuit is closely associated with personal gain, given the various benefits that accompany political status. This personal profit has both a hierarchical (vertical) and functional (horizontal) component. Given China’s status as a unitary socialist state, local governments operate under highly similar social, political, and cultural conditions. Officials from different local governments who compete for the same political position are also likely to share similar economic circumstances (Gu, 2014; Zhang et al., 2017).

In light of the aforementioned considerations, we posit homogeneity among officials of local governments and local conditions, thereby implying the existence of solely endogenous comparative advantage in local development. It is noteworthy that the conclusions derived from this model can be extended to encompass governmental behaviors characterized by exogenous comparative advantage. We assume that all local officials possess a risk-averse preference, and the extent to which they can evade risks is measured by the parameter ( $\Delta$ ) is measured by  $A \in (0, 1)$ . To simplify our model, we assume the presence of one central government and two local governments ( $\alpha$  and  $\beta$ ).

We use  $F$  (functional) to represent the part of officials’ profit from the political position that is determined by the function of their office and  $H$  (hierarchical) to represent the part that is determined by their office’s place in the hierarchy. If we assume that  $E_\alpha$  stands for the expected utility of official  $\alpha$ ,  $p_i$  represents the subjective probability that government behavior  $i$  can produce positive performance in official  $\alpha$ ;  $R_i$  stands for the resources (mainly fiscal expenditure) obtained by official  $\alpha$  to carry out government behavior  $i$ ;  $x_i$  stands for the return official  $\alpha$  gets from implementing government behavior  $i$ ;  $\varepsilon$  stands for the rate of return of exogenous government behaviors when we assume that the rates of return of all the government behaviors are the same; and  $Z_i$  stands for the individual benefit official  $\alpha$  gets from implementing government behavior  $i$ .  $y_i$  stands for the return official  $\beta$  gets when he or she adopts government behavior  $i$ . Consequently, the expected utility function of official  $\alpha$  and its constraints can be represented as follows:

$$\text{Max}_{\{x_i\}} E_\alpha = \sum_{i=1}^n p_i Z_i^\alpha; 0 < A < 1, \sum_{i=1}^n p_i = 1$$

$$\text{Subject to: } \sum_{i=1}^n R_i = 1; R_i > 0$$

$$x_i = (1 + \varepsilon)R_i$$

$$Z_i = Fx_i + H(x_i - y_i); F > 0, H > 0;$$

Similarly, the expected utility of local official  $\beta$  is represented by  $E_\beta$ ; the subjective probability that official  $\beta$ ’s government behavior  $i$  can generate performance is represented by  $q_i$ ; resources obtained by official  $\beta$  to carry out government behavior  $i$  is represented by  $T_i$ ;  $y_i$  stands for the return official  $\beta$  gets from government behavior  $i$ ;  $\varepsilon$  stands for the rate of return of exogenous government behaviors when we assume that the rates of return of all the government behaviors are the same.  $S_i$  stands for the individual benefit official  $\beta$  gets from implementing government behavior  $i$ , and  $x_i$  stands for the return official  $\alpha$  gets

when he or she adopts the government behavior  $i$ . The expected utility functions of official  $\beta$  and its constraints are as follows:

$$MaxE_{\beta} = \sum_{\{y_i\}}^n q_i S_i^{\beta}; 0 < A < 1, \sum_{i=1}^n q_i = 1$$

Subject to:

$$\sum_{i=1}^n T_i = 1; T_i > 0$$

$$y_i = (1 + \epsilon)Y_i$$

$$S_i = Fy_i + H(y_i - x_i); F > 0, H > 0;$$

When we put several constraint conditions into the expected utility function and simplify the formulas, the expected utilities of official  $\alpha$  and  $\beta$  can then be expressed as follows:

$$MaxE_{\alpha} = \sum_{\{R_i\}}^n p_i [FR_i + H(R_i - T_i)]^A (1 + \alpha)^A$$

$$MaxE_{\beta} = \sum_{\{R_i\}}^n q_i [FT_i + H(T_i - R_i)]^A (1 + \epsilon)^A$$

We take the first derivative of the two formulas and simplify them, obtaining the following equations:

$$dE_{\alpha}/dR_i = p_i [FR_i + H(R_i - T_i)]^{A-1} - \sum p_{-i} [F(1 - R_{-i}) + H(T_{-i} - R_{-i})]^{A-1} = 0$$

$$dE_{\beta}/dT_i = q_i [FT_i + H(T_i - R_i)]^{A-1} - \sum q_{-i} [F(1 - T_{-i}) + H(R_{-i} - T_{-i})]^{A-1} = 0$$

In the two equations,  $-i$  stands for all government behaviors except  $i$ . The above equations reveal that a local government official's decision regarding how to behave in his or her official capacity depends on how officials in other jurisdictions behave.

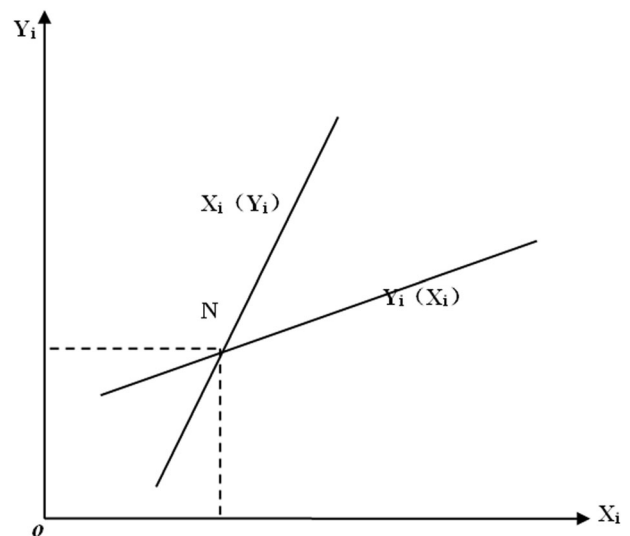
Calculating the slope of the response functions yields the following results:

$$dR_i/dT_i = H/(F + H) > 0;$$

$$dT_i/dR_i = H/(F + H) > 0;$$

The slopes of the two response functions are found to be identical and positive, which enables us to represent their relationship in Fig. 2. The point of Nash equilibrium in the competition among different governments is represented by the crossover point, N, in the reaction curves. At the Nash equilibrium point, if a government official decides to increase fiscal expenditure on a particular behavior, officials from other local governments would follow suit, resulting in an endless emergence of NPOGBs in China. This is the fundamental reason why NPOGBs tend to dominate in the local governments of China.

The implementation of PE campaigns in China's public sector has introduced a new incentive for government officials. Under the constraints of limited information, local officials tend to maintain their relative gains vis-à-vis their peers and seize limited promotion opportunities while avoiding risks. To this end, they adopt the strategy of imitating their peers' behaviors, as demonstrated in our model, where local officials  $\alpha$  and  $\beta$  mutually influence each other by imitating each other's behaviors. If local official  $\alpha$  decides to increase financial investment in a particular governmental behavior, local official  $\beta$  is highly likely to follow suit. Such imitation strategies adopted by local officials  $\alpha$  and  $\beta$  inevitably lead to the proliferation of NPOGBs. It is evident that NPOGBs are the deliberate choices made by local officials when confronted with intergovernmental competition, and they



**Fig. 2 Reaction functions of local governments.** The picture shows the behavioral response functions of local officials in governmental competition.

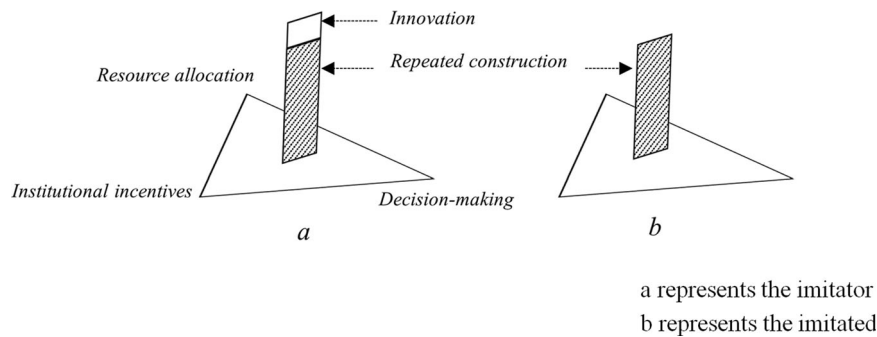
represent a man-made consequence of the performance-based promotion system.

The proliferation of NPOGBs as a result of local officials' imitation strategies unveils profound economic implications within China's public sectors. This underscores the intricate interplay between institutional incentives, decision-making processes, and resource allocation dynamics within the government bureaucracy. In light of these considerations, local officials may find it advantageous to adopt a strategy of emulating the actions and behaviors of their competitors, thereby either achieving a stalemate or fortifying their position. Moreover, some officials, in their emulation of rivals, may choose not to overtly disclose their intentions; instead, they may innovate upon emulation to attain superior performance relative to their competitors, thereby gaining a competitive advantage. In any case, emulating the behaviors of competitors represents a prudent strategy, as illustrated by the analogy of "a" mirroring "b" in Fig. 3. Consequently, the optimal decision-making approach for local officials involves securing limited incentives within the organization while also maximizing authority over resource allocation. However, achieving this ideal state is impossible, prompting local officials to settle for suboptimal solutions. The local officials emulate peers' behaviors to safeguard relative gains and secure limited promotion opportunities while mitigating risks, navigating the constraints of limited information and intergovernmental competition. Consequently, NPOGBs epitomize the unintended consequences of the performance-based promotion system, shedding light on the complex mechanisms through which incentives shape economic behaviors and governance outcomes in organizational settings.

**Conclusion**

The phenomenon of NPOGBs is widespread in a unitary system in which the central government encourages local competition. Based on a conceptual analysis of NPOGBs, this study employs game theory to develop a theoretical model that explains the causes of NPOGBs and explores how competition among different jurisdictions may lead to them. Specifically, this research presents several findings.

First, NPOGBs are distortions in governmental behavior that are inconsistent with or even go against the requirements of government performance and are harmful to people's welfare in



**Fig. 3 The mechanism of repeated construction.** The picture illustrates the process where government official **a** imitates competitor **b**, elucidating the underlying reasons for repeated construction.

the long run. POGBs represent a state of Pareto optimality in government behavior where performance improves in one jurisdiction without harming other jurisdictions. But disappointingly, POGBs only account for a small fraction of all government behaviors. The majority of behaviors are NPOGBs.

Second, NPOGBs are rational choices on the part of local officials given China's current intergovernmental competition system. Intergovernmental competition in China has two aspects: on the one hand, officials of similar administrative levels compete with each other to improve key evaluation indicators (e.g., GDP growth, tax income) the most; on the other hand, they also compete for scarce promotion opportunities. As shown in our model, the two types of competition are related: the decision to promote an official depends on how well he or she has done in the competition to improve key evaluation indicators (i.e., performed his or her job). In the game of promotion, only a few individuals secure positions (Zhuravskaya, 2000; Xu, 2011). The promotion of one candidate directly decreases the chance of another's promotion, and the achievement of one constitutes others' loss (Qian and Roland, 1996). Therefore, the competition for promotion is a zero-sum game, and as such, players need special strategies to win. Our model shows that local government officials, without strict legal constraints to rein them in, will adopt strategies that even if they lead to good performance evaluations in the short term and secure the officials' promotion, profoundly distort the normal competitive order and may result in long-term negative consequences. As noted earlier, under a situation of information constraints, local officials, to avoid risks, maintain their relative gains vis-à-vis their peers, and seize limited promotion opportunities, will adopt the strategy of imitating their peers' behaviors, leading to a proliferation of NPOGBs.

This study represents a novel contribution to the existing literature by focusing on government officials who make critical decisions. Building upon an early strand of behavioral political economics that investigates public policy settings characterized by decision-makers with competing self-interests, the current research offers a unique perspective on this phenomenon. According to our conceptual model, NPOGBs are intentionally initiated by government officials who aim to maximize their interests. This implies that NPOGBs can be viewed as a type of preventable "human error" or "man-made mistake" that can be anticipated and avoided through appropriate measures taken in advance. Our research can thus be seen as an extension of previous work, as we examine intended counterproductive behavior that has been relatively underexplored. This perspective is valuable in enhancing our understanding of theories in public policy, government decision-making, and politics surrounding the decision-making process.

**Implications of the findings.** Undoubtedly, NPOGBs have resulted in adverse outcomes for the entire society. Our model

demonstrates that such behaviors are avoidable, and we propose several approaches to mitigate them.

First, to solve the problem of excessive local competition in decentralized countries—and the resultant ubiquitous NPOGBs—central governments need to make and implement new decentralized policies that improve or replace the current ones. Practically speaking, decentralization must do more than simply transfer authority and responsibility from the central government to local ones. It must motivate local governments to develop coordinately so that the whole country can advance (De Oliveira, 2002). Faced with a great number of NPOGBs caused by excessive local competition, the central government must create and implement policies that encourage cooperation among local governments—cooperative decentralization. Public financial resources, taxes, and political support should all be used to encourage cooperation among local governments. Moreover, the central government must help the local governments at all levels build political, economic, societal, and even cultural cooperative abilities. Future performance evaluations should give high marks to local governments that demonstrate they are cooperating with neighboring jurisdictions. The central government could also reward local governments who cooperate with their counterparts and promote the public officials working in these local governments. Such measures could overcome the NPOGB caused by excessive local competition.

Second, in future practice, a local government could offer opportunities for people or their representatives from neighboring jurisdictions to contribute to making and implementing public policies. This would make it more likely that local governments would behave in a manner that did not harm neighboring jurisdictions. This approach can be thought of as a neighborhood governance style of policymaking and implementation. A neighborhood governance style could help to eliminate all kinds of NPOGBs, resulting in a new, win-win government behavior model for neighboring local governments, not only in China but also in other countries with similar management contexts. To enlist citizen participants, a government could use random sampling from telephone directories, car license numbers, ID numbers, etc. Once a cohort has been selected, the government could encourage them to get involved in making, implementing, and evaluating local policy.

Third, a spirit of cooperation and participation is needed to eradicate local-governments' NPOGBs requires. When a local government makes policies that are likely to have spillover effects on other jurisdictions, it could be required to send its policy texts to the governments that are likely to be affected (stakeholders) to get advice and make improvements. Then, as the policies are approved, the local government could invite representatives from the stakeholders to implement them. Finally, the government could invite the stakeholders to participate in the evaluation of the policy performance. Such a pattern would prevent local governments from



harming neighboring jurisdictions and would result in a Pareto optimality in local government competition.

As a preliminary attempt at explaining NPOGB, this study has certain limitations that indicate possible routes for future research. For instance, researchers may wish to consider whether the terms POGB and NPOGB are accurate, whether the definitions are inclusive, and whether the division between POGB and NPOGB is scientific. In addition to those clarifications, the concepts should be tested in empirical studies under varied administrative contexts.

### Data availability

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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### Notes

- 1 The report on the repeated construction of the airport can be found at <https://www.chinanews.com/m/sh/2019/08-29/8940758.shtml>.
- 2 The emergence of new energy vehicles and telecommunication towers as prominent industries or infrastructural components over the past decade has been notable. However, their advent has been accompanied by a concerning trend of recurring construction efforts. Presented herein are pertinent reports elucidating the phenomenon of repetitive construction within the realms of new energy vehicle development and telecommunication tower deployment. These pieces of news are from the portal website of the Chinese government and China News Weekly respectively. [https://www.gov.cn/zwhd/2005-08/04/content\\_20409.htm](https://www.gov.cn/zwhd/2005-08/04/content_20409.htm); <https://finance.sina.cn/china/gncj/2021-03-01/detail-ikftssap9307077.d.html?cref=cj>.
- 3 The data source is the Statistical Bulletin on National Economic and Social Development for the year 2023 issued by China's National Bureau of Statistics.
- 4 The administrative structure of China is marked by a hierarchically organized, integrated party-state system (Liu, Toby, and Man, 2021). The system is composed of five levels of governance: central, provincial, municipal, county, and township. Within this hierarchical structure, superiors issue directives to their subordinates, which are implemented with great diligence. Given the emphasis of the central government on economic development and reform, it is reasonable to expect that economic growth and performance may increase the likelihood of officials being promoted and receiving greater financial resources at lower levels of government. This governance logic is applicable across all five tiers of the Chinese governmental system, and the research findings are generalizable to all levels of government. In this research, the term "local government" mainly refers to the "provincial-level government" in China. This is due to the fact that provincial-level governments enjoy greater autonomy and receive larger budgetary allocations as compared to their counterparts at the prefecture or city level. As a result, NPOGBs of provincial governments are more prone to experiencing severe adverse outcomes.

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### Author contributions

All authors contributed to the conception and design of the study. H-PS: conception and design of the study or experiment; providing substantial contributions to the intellectual content and methodology; taking responsibility for the accuracy and integrity of the work as a whole; validation, supervision, and funding acquisition. H-ML: writing the first draft of the manuscript; communicating with co-authors, editors, and peer reviewers; handling correspondence related to the manuscript submission, review process, and publication.

WL: review, editing, and polishing; overseeing the research project and its execution; addressing any post-publication queries or issues.

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The authors declare no competing interests.

### Ethical approval

This article does not contain any studies with human participants performed by any of the authors.

### Informed consent

This article does not contain any studies with human participants performed by any of the authors.

### Additional information

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