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Effects of economic growth target on the local government industrial land allocation: an empirical study from China

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Economic growth targets (EGTs) play an important role in shaping local government behavior in China, yet their implications for industrial land allocation remain insufficiently understood. Based on panel data from 275 prefecture-level cities in China from 2007 to 2022, this study empirically examines the impact of EGTs on local governments' industrial land allocation. The results show that EGTs significantly expand the scale of industrial land grants while simultaneously suppressing industrial land prices and reducing the degree of land marketization. Moreover, the effects exhibit significant heterogeneity across regions, development periods, levels of industrialization, and stages of economic development. Mechanism analyses further reveal that EGTs generate notable top-down amplification effects, constraint effects, and spatial spillover effects. Specifically, top-down amplification strengthens the influence of EGTs on industrial land allocation, while hard constraints exert a stronger negative impact on land prices and a more pronounced positive effect on land supply compared with soft constraints. In addition, EGTs not only affect industrial land allocation within a city but also produce significant spatial spillover effects on neighboring regions in the same direction. These findings provide empirical evidence for understanding the behavioral logic of local governments and offer policy implications for promoting high-quality regional economic development.

KEYWORDS
economic growth targets, environmental policy, industrial land, local government, urban economy

1 Introduction

Against the backdrop of profound adjustments in the global economic landscape and domestic economic transformation, China's economic growth model is transitioning from factor-driven to innovation-driven (Hou and Feng, 2024; Kong et al., 2024). Land, as a fundamental production factor, is central to local economic growth, particularly industrial land allocation (Feng et al., 2019). Through industrial land allocation, local governments can not only generate fiscal revenue but also shape industrial distribution and influence long-term growth paths (Mo, 2018; Tian, 2024; Zhang D. et al., 2022). The establishment of economic growth targets (EGTs) and associated assessment mechanisms has profoundly influenced local government decision-making, often incentivizing short-term expansion at the expense of sustainable development (Chai et al., 2021). To attract investment, many municipalities have depressed industrial land prices, leading to inefficient expansion and market distortions (Henderson et al., 2022; Qi et al., 2025). As China's economy shifts from

rapid expansion toward high-quality development, understanding the relationship between EGTs and land allocation is particularly urgent (Chen et al., 2025; Yang et al., 2023).

Current research has primarily examined the effects of EGTs on local government behavior. EGTs are a fundamental component of national macroeconomic policies, and academics contend that they have historically been essential in directing local economic development (Chai et al., 2021). By setting these targets, local governments can influence resource allocation and policy formulation, often escalating EGTs to showcase their competence and adherence to higher-level policies, thereby creating top-down target constraints (Chen et al., 2021; Yao and Zhang, 2015). This politically motivated target-setting strategy has spurred rapid economic growth in the short term through large-scale investment and infrastructure development. However, it has also led to excessive resource concentration and misallocation, which is a serious danger to long-term sustainable development (Chen and Tang, 2024; Guo et al., 2024). It has also suppressed expenditures on public services such as education and technological advancement (Liu et al., 2020). Strict EGTs also often induce local administrations to implement short-term strategies, such as land expansion and crude urbanization, to accelerate economic growth. This not only exacerbates low-density urban sprawl and wasted resources but also impedes urban spatial optimization (Liu et al., 2020; Zhang Y. et al., 2022). It has also exacerbated rural marginalization, widened the urban-rural income gap, intensified social inequality, and constrained long-term economic growth through labor mismatch and capital misallocation (Yan et al., 2025). These phenomena highlight the trade-off between quantity and quality in EGT implementation (Zhang Y. et al., 2022).

Existing research has examined EGTs from multiple perspectives, including their impacts on local government investment, infrastructure expansion, environmental outcomes, and fiscal behavior (Chen et al., 2021; Yao and Zhang, 2015; Zhang Y. et al., 2022; Yan et al., 2025). However, systematic evidence on how EGTs reshape industrial land allocation—a direct and powerful instrument of local governments—remains limited. This omission is significant because land allocation represents one of the most discretionary tools available to local authorities, and the misallocation of industrial land has long-term consequences for both efficiency and equity. We therefore conducted a systematic analysis of the effects of EGTs on the industrial land allocation of local governments using panel data from 275 Chinese cities at the prefectural level and above from 2007 to 2022 while thoroughly investigating the heterogeneity of these effects.

This study contributes to the literature on local government behavior and land policy in three main respects. First, it provides systematic city-level evidence on how economic growth targets (EGTs) are associated with the scale, price, and marketization of industrial land allocation, using panel data from 275 Chinese cities over the period 2007–2022. Second, spatial econometric methods are employed to account for cross-regional interactions, revealing spatial spillover effects in EGT-driven land allocation decisions. Third, the effects of EGTs are analyzed within an integrated framework that incorporates top-down amplification, target constraints, and spatial spillovers, thereby clarifying the institutional channels through which growth targets influence land market outcomes.

By doing so, this paper advances the literature on local government behavior and land policy by moving beyond general discussions of fiscal incentives or environmental trade-offs to highlight the institutional logic behind land allocation decisions. The findings also provide actionable insights for optimizing land allocation policies in support of high-quality regional economic development.

The remainder of this paper is structured as follows: Section 2 presents the research hypotheses and theoretical analysis. Section 3 outlines the research methodology and describes the data. Section 4 presents the primary research findings, while Section 5 provides an extended analysis based on the primary research findings. Section 6 summarizes the conclusions and proposes relevant policy implications.

2 Theoretical analysis and research hypotheses

The first step in exploring the relationship between the EGT and local governments' industrial land allocation is the systematic analysis of the formation mechanisms and policy requirements behind the EGT setting. The next step is analyzing these mechanisms their impact across three key dimensions: price, scale, and marketization. Building on this, it is then possible to explore the interactions between the EGT and industrial land allocation by analyzing their internal logic in two dimensions.

2.1 Institutional drivers of economic growth targets

In China, the EGT is not only a development-oriented macroeconomic policy but is also a central driver of promotion incentives and competition among local government officials. Intergovernmental competition has played a major role in China's rapid economic growth since the reform and opening-up, and the central government has fostered strong promotion incentives by establishing EGTs (Chen et al., 2025; Chen and Tang, 2024). Local governments thus often adopt an approach of top-down amplification (i.e., from national to provincial to municipal levels) to setting EGTs as they compete for resources to enhance political standing, and meet performance objectives, thus leveraging economic expansion to boost their status and facilitate political advancement (Chen et al., 2021; Li et al., 2019; Ma, 2016). EGTs have thus gradually evolved into key performance indicators for local government officials and shaped a promotion tournament model that is unique to China (Li et al., 2019).

Local government officials are primarily motivated by promotion incentives, because their career advancement and mobility often depend on the economic performance of their region. Higher levels of government typically assess officials' effectiveness based on economic indicators, with GDP growth rate, industrial output value, and other metrics providing the core performance evaluation criteria. Achieving EGTs is thus directly tied to their standing within the political system (Li and

Zhou, 2005; Luo and Qin, 2021; Yao and Zhang, 2015). Beyond promotion incentives, local governments also face comparative pressures within the yardstick competition, as the report card for local economic growth reflects local governments' competitiveness at both central and higher administrative levels in China's administrative system (Huang and Du, 2017; Su et al., 2012). Local governments thus engage in horizontal competition with neighboring regions and other provinces in economic growth performance as they strive for increased central support and resource allocation (Caldeira, 2012; Du and Yi, 2022). Motivated by the incentives for promotions and horizontal competition, local governments have progressively escalated their EGTs, which has led to a top-down amplification of EGTs. Given resource constraints, land finance has emerged as a crucial instrument for fostering economic growth.

2.2 How economic growth targets affect industrial land allocation

Within a development model centered on economic growth, industrial land allocation has emerged as a critical policy instrument for local governments to achieve EGTs. The regulation of the price, scale, and degree of marketization for industrial land directly influences the pace and structure of local economic development (Shu et al., 2018; Tian, 2024; Zhang D. et al., 2022). Offering industrial land at reduced prices has been a key strategy for attracting investment by significantly lowering the barriers to enterprise entry and alleviating cost pressures. To meet EGTs, local governments frequently reduce industrial land prices to incentivize business relocation, thereby stimulating short-term economic expansion, increasing employment opportunities, and boosting local fiscal revenues (Huang and Du, 2017; Lan et al., 2023; Mo, 2018; Wang et al., 2021). Low-cost land policies also enhance regional competitiveness, which leads to further amplification of EGTs. This practice not only reinforces the tendency of governments to supply industrial land at reduced prices but also generates spatial spillover effects due to interregional competition, which ultimately causes the price of industrial land to "race to the bottom" (Bai et al., 2024; Wang et al., 2021).

Beyond price regulation, expanding the scale of the supply of industrial land provides another direct approach to economic expansion as it generates the essential spatial capacity for regional industrialization and economies of scale. Local governments can draw in a large number of businesses by expanding the supply of industrial land, thus rapidly expanding industrial production capacity and facilitating the development of integrated upstream and downstream supply chains. This approach promotes industrial agglomeration and growth in the local economy (Dai et al., 2021; Li et al., 2024). Similarly, a large-scale supply of land fosters strategic interactions among local governments, thus amplifying the influence of EGTs on industrial land allocation. This dynamic results in policy convergence and spatial spillover effects, which culminate in a "race to the top" in industrial land allocation among competing localities (Fan et al., 2020; Wang et al., 2020; Wang et al., 2021). The strategy of providing industrial land at low prices and in large quantities thus reflects a government-driven approach to economic expansion and constitutes a non-market-oriented intervention to achieve growth objectives (Liu et al., 2016; Qi et al., 2025). This administrative intervention weakens market mechanisms in land resource allocation, distorts prices, and disrupts competitive dynamics in the market for industrial land, ultimately reducing the degree of marketization (Du and Li, 2021; Yuan et al., 2019). These distortions become more pronounced under rigid EGTs, as local governments intensify administrative controls to meet predefined objectives. Conversely, when EGTs are more flexible, governments have greater latitude to allow market forces to take a more active role in the allocation of industrial land. Building on this theoretical analysis, the following research hypotheses can be put forward:

Hypothesis 1: Increases in EGTs significantly reduce both the price and marketization level of industrial land allocated by local governments while simultaneously promoting the expansion of industrial land.

Hypothesis 2: Through the top-down amplification of EGTs, increases in these targets amplify their impact on industrial land allocation.

Hypothesis 3: The effects of EGTs on local governments' allocation of industrial land are heterogeneous under varying degrees of restrictions.

Hypothesis 4: The impact of EGTs on industrial land allocation has spatial spillover effects that influence not only land allocation within the region but also have a homogeneous indirect influence on neighboring regions.

3 Study design

3.1 Model setup

The following benchmark model was developed to investigate how local government industrial land allocation is affected by EGTs:

$$Land_{i,t} = \alpha_0 + \alpha_1 EGT_{i,t} + \alpha_2 controls_{i,t} + \lambda_i + \delta_t + \varepsilon_{i,t} \quad (1)$$

Formula 1 $Land_{i,t}$ represents the industrial land allocation in city i during period t, encompassing three dimensions: allocation price (*price*), allocation scale (*scale*), and allocation market (*market*); $EGT_{i,t}$ represents the EGT for city i during period t; *controls* represent the control variables, α is the coefficient to be estimated, λ_i is the individual fixed effect, δ_t is the time fixed effect, and ε is the random disturbance term.

3.2 Variables

3.2.1 Explained variables

Local government industrial land allocation (*Land*) encompasses three key dimensions: price, scale, and marketization. The price (*price*) objectively reflects the dynamics of supply and demand fora region's land market and indicates the local government's economic and environmental policy orientation.

TABLE 1 Coding rules for economic growth target statements.

Expression type	Example text	Coding rule	Numerical value
Point target + modifier	"Around 7%"	Use stated value	7
Interval target	"6%–7%"	Interval mean	6.5
Lower-bound target	"Not lower than 6%"	Lower bound	6
Compound	"Around 6%, not lower than 5.5%"	Lower bound prioritized	5.5

Drawing on relevant research (Lu and Wang, 2020; Xu et al., 2022), price was measured using the average transfer price of industrial land in each city. The scale of industrial land allocation (*scale*) reflects the local government's support for industrial development and is a key factor influencing regional industrial layout. The scale of industrial land allocation was measured, based on relevant research, using the total transfer area of industrial land in each city (Li et al., 2022; Xu et al., 2022). Marketization (*market*) reflects the balance between government intervention and market mechanisms, and the ratio of the actual transfer price to the cost price (i.e., the industrial land premium rate) was used to measure this variable. More specifically, the national minimum price standard for industrial land transfer divides industrial land into 15 grades, each with a corresponding minimum price. The lowest price standard was used as the cost price, and marketization level was measured by calculating the ratio of the actual transfer price to the cost price (i.e., the rate of the premium for industrial land). The calculation method for the premium of industrial land in city i is shown in Formula 2:

$$ILM_{i,r} = \frac{p_{i,r}}{S_{i,r}} \Big/ C_{i,r} \tag{2}$$

The calculation method for the industrial land premium rate for city i in year t is shown in Formula 3:

$$ILM_{i,t} = \sum_{r=1}^{15} \frac{S_{i,r}}{S_i} \times LM_{i,r} \tag{3}$$

where $P_{i,r}$ and $S_{i,r}$ represent the total revenue and total area, respectively, of r-grade industrial land in city i; $C_{i,r}$ is the unit cost price of the r-grade industrial land in city i; S_i is the total area of industrial land in city i; $ILM_{i,r}$ represents the premium rate for r-grade industrial land in city i; and $ILM_{i,t}$ denotes the premium rate of industrial land in city i during year t. Taken together, this represents the marketization level of industrial land.

3.2.2 Core explanatory variables

Economic growth targets (EGTs) are operationalized using information extracted from annual government work reports issued by prefecture-level city governments. Given the textual heterogeneity and the frequent use of qualitative modifiers and interval expressions in growth-target statements, a standardized coding protocol is implemented to ensure measurement consistency and replicability. Specifically, growth-target statements are first classified into distinct categories according to their textual structure: (i) point targets with qualitative modifiers, (ii) interval targets, and (iii) lower-bound targets. For point targets expressed with modifiers such as "around,""approximately,"or similar expressions, the explicitly stated numerical value is adopted. For interval targets (e.g., "6%–7%"), the arithmetic mean of the interval is used. For lower-bound targets containing expressions such as "not lower than,""at least,"or"above," the stated lower bound is taken as the numerical value. In cases where multiple modifiers or compound expressions appear simultaneously, a unified decision rule is applied. Explicit numerical constraints (intervals or lower bounds) are prioritized over qualitative modifiers, and lower-bound information is given precedence when both interval and lower-bound expressions are present. All growth-target statements are coded manually following this predefined protocol. Ambiguous cases are resolved through repeated cross-checking and reference to the surrounding textual context within the same report to ensure internal consistency. The coding rules are applied uniformly across all cities and years to ensure temporal and cross-sectional comparability. The standardized and auditable coding protocol is shown in Table 1.

3.2.3 Control variables

Six control variables were chosen to account for the influence of other significant factors: economic development level (*pgdp*); degree of government intervention (*gov*); level of opening up (*open*); science and technology support (*goin*); urbanization level (*urban*); and population size (*people*). Table 2 provides detailed explanations of the variables.

3.3 Data sources

Panel data from 275 prefecture-level and higher cities in China were employed, spanning the period from 2007 to 2022. The EGT data were manually obtained from the government work reports of each city; industrial land transfer data were sourced from the Land Market Website; and data for intermediary and control variables were collected from the China City Statistical Yearbook, relevant provincial and municipal statistical yearbooks, and statistical bulletins. Administrative divisions and cities with significant data gaps during the study period were excluded, and individual missing data were supplemented using interpolation.

4 Empirical results and discussion

4.1 General results

Table 3 presents the results of the impact of EGTs on local governments' industrial land allocation, with Models (1) through (3)

TABLE 2 Variable definitions and data processing.

Variable classification	Variable name	Abbreviations	Data processing
Explained variable	Price of industrial land	*price*	Logarithmic average price of industrial land
	Scale of industrial land allocation	*scale*	Logarithm of the total area of industrial land offered for sale
	Marketization industrial land	*market*	See text for details on measurement of marketization
Core explanatory variables	Economic growth targets	*EGT*	Collected from the work reports of city governments
Control variables	Economic development level	*pgdp*	Logarithm of GDP *per capita*
	Government regulation strength	*gov*	Local fiscal expenditure/GDP
	Opening to the outside world level	*open*	Foreign direct investment/GDP
	Science and technology support	*goin*	Science and technology expenditure/GDP
	Urbanization level	*urban*	Rate of urbanization
	Population size	*people*	Logarithm of population density

TABLE 3 Benchmark regression results for the effects of economic growth targets on industrial land allocation.

Variables	(1) Price	(2) Scale	(3) Market
EGT	−0.145*** (−6.60)	0.624*** (6.02)	−0.026** (−2.43)
pgdp	0.319*** (3.66)	0.322*** (5.80)	0.159*** (8.34)
gov	−0.724*** (−6.88)	0.181*** (7.28)	−0.314*** (−5.73)
open	−0.601*** (−3.05)	0.046*** (3.54)	−0.003*** (−2.62)
goin	0.042*** (3.69)	0.157*** (5.86)	−0.030* (−1.86)
urban	0.313*** (2.78)	−0.178*** (−6.65)	0.252*** (4.50)
people	0.248*** (3.75)	−0.079 (−0.51)	−0.107*** (−3.21)
cons	0.012 (0.03)	−0.413 (−0.41)	0.621*** (3.07)
Year fixed effects	YES	YES	YES
City fixed effects	YES	YES	YES
R-squared	0.587	0.585	0.263
Observations	4,400	4,400	4,400

(1) The statistical metrics of the coefficient estimates are shown in parentheses. (2) ***p < 0.01, **p < 0.05, *p < 0.1.

showing the effects of EGTs on industrial land prices, scale, and marketization, respectively. First, the results from Model (1) indicate that the EGT settings significantly negatively affect industrial land grant prices at the 1% significance level. Specifically, each unit increase in the EGT leads to a decrease of 0.145 units in land prices. This suggests that the pressure from EGTs significantly inhibits the rise in industrial land prices. When setting higher growth targets, local governments tend to lower the concession prices for industrial land to attract corporate investment and industrial development, thereby achieving GDP growth targets rapidly. This reflects local governments' development-oriented land competition strategy.

Second, the results in Model (2) show that EGTs have a significant positive effect on the scale of industrial land grants; each unit increase in the EGT leads to a 0.624-unit increase in the scale of industrial land. This indicates that an increase in the EGT significantly drives the expansion of the scale of industrial land grants, which reflects the logic that local governments tend to increase the supply of land to achieve growth targets. The scale of the industrial land supply is a crucial factor for attracting investment and promoting industrial development, as well as a competitive tool among local governments, so it is deliberately expanded under the influence of local governments' pursuit of EGTs. By providing an adequate amount of industrial land, local governments can draw in more industrial ventures and generate short-term economic growth. Local governments also engage in land competition with other regions to increase land grant revenues, which supplement local finances.

Third, the results from Model (3) indicate that EGTs significantly negatively affect the industrial land marketization at the 5% significance level. Specifically, each unit increase in the EGT results in a 0.026-unit decrease in marketization. This suggests that an increase in the EGT inhibits the growth of marketization, perhaps because local governments are more likely to attract investment

through administrative interventions (e.g., low-priced concessions or targeted land supply) when pursuing EGTs, which weakens the marketization of land concessions.

4.2 Endogenous processing

This study controlled for a series of macroeconomic factors, as well as time and regional fixed effects that influence the allocation of local government industrial land. However, considering the potential causal relationship between the EGT setting and industrial land allocation, the instrumental variable method was used to deal with possible endogeneity problems. Because the instrumental variable must have a significant correlation with the endogenous explanatory variable (EGT), the instrumental variable the average EGT of other prefecture-level cities in the same province, excluding the target of the city itself (IV-1) was selected, along with the interaction term between the number of prefecture-level cities in the province and the national EGT for the next two periods (IV-2), following related research (Chen et al., 2025; Li et al., 2019). The rationale for the instrumental variables is that China's unique appraisal mechanism for government officials is the key institutional context through which higher EGTs empower local economies. This appraisal mechanism not only links economic growth performance directly to the promotion, appointment, and dismissal of local government officials but also subtly shapes the policy orientation and behavioral logic of local governments. Higher EGTs provide local governments with considerable incentives to foster economic development, which means that, regardless of whether these targets are met, actual economic performance tends to be higher. Consequently, to signal their competence and gain a competitive advantage in promotion tournaments, local officials often engage in a race to amplify the EGT, which leads to competition in setting targets. This phenomenon is particularly pronounced in provinces with more prefectural-level cities, as the promotion tournament becomes quite fierce due not only to the similarity in geographic location and economic development levels but also because, given the fixed number of available promotions, the competition for promotion in provinces with more prefectural-level cities is increasingly fierce as the number of contenders rises. The extent of EGT amplification thus also tends to be relatively higher.

Because the sample in this paper consists of panel data, using the number of prefecture-level cities in the province alone as an instrumental variable would not be possible due to fixed effects. We therefore constructed an interaction term between the number of prefecture-level cities in the province (which reflects individual variation) and the mean value of the national EGT for the next two periods (which reflects time variation). This interaction term was then used as an instrumental variable for the growth targets of prefecture-level cities. On the one hand, the mean EGT of prefecture-level cities in the same province (excluding the city itself) and the interaction between the number of prefecture-level cities in the province and the national EGT for the next two periods directly influence the regional EGT and indirectly affect industrial land allocation by influencing the EGT of the prefecture-level city, rather than directly affecting land prices, scale, or marketization. On the other hand, the average national EGT for the next two periods does not influence the setting of local municipalities' EGTs in the current year due to temporal differences, nor does it affect local governments' allocation of industrial land. The mean EGT of prefecture-level cities in the same province (excluding the city itself), along with the interaction term between the number of prefecture-level cities in the province and the national EGT for the next two periods, would thus be suitable instrumental variables for the EGT of prefecture-level cities.

The four municipalities of Beijing, Shanghai, Tianjin, and Chongqing were excluded from the regression, and the test results are presented in Table 4. The regression coefficients for the effects of the two instrumental variables on the EGT in Columns (1) and (2) are all significantly positive, which indicates that they strongly correlate with the core explanatory variables. In Columns (3)–(8), the Hausman test results pass, and the p-value of the one-stage F-statistic is greater than 10 and significant at the 1% level. The KP–Wald F-statistic also significantly exceeds the critical value of 16.39, thus strongly rejecting the hypothesis of weak instruments and confirming the absence of weak instrument issues. The regression results for the instrumental variables also align with those of the benchmark regression and are significant at least at the 10% level, which indicates the robustness of the benchmark regression results.

4.3 Robustness test

4.3.1 Baseline robustness tests

To ensure the reliability and robustness of the test results, four methods were employed to assess the robustness of the regression outcomes (Table 5). First, some of the explanatory variables were replaced. The measurement of allocation size was changed from a calculation based on transfer area to the number of transferred lots; and marketization was quantified as the percentage of industrial land area transferred through auction, bidding, and listing rather than the overall transfer area. Second, the shrinking tail treatment was applied. To mitigate the impact of extreme values on the regression results, the industrial land allocation data and EGT data were re-examined after a bilateral shrinkage of 1%. Third, municipalities, provincial capitals, and planned cities were excluded. Municipalities directly under the central government, provincial capitals, and separately listed cities typically have higher economic status and more distinct land market mechanisms than general cities. To prevent the distinct features of these cities from affecting the outcomes, a regression was conducted that excludes these cities. Fourth, to exclude the effects of the 2008 financial crisis and the 2020 COVID-19 pandemic on economic and social development, the study period was shortened to 2009–2019 for testing. The results indicate that the impact of EGT setting on industrial land allocation by local governments was generally consistent with the benchmark regression results, and the study's findings are thus robust.

4.3.2 Robustness to model specification changes

To address concerns regarding potential omitted-variable bias and the sensitivity of the results to model specification, this study further conducts robustness tests by sequentially augmenting the baseline model with additional control variables that capture key institutional and demand-side factors. Specifically, local fiscal

TABLE 4 Instrumental variable regression results.

Variables	Economic growth target		Price dimension		Scale dimension		Marketization dimension	
	(1) *EGT*	(2) *EGT*	(3) *price*	(4) *price*	(5) *scale*	(6) *scale*	(7) *market*	(8) *market*
IV-1	0.076*** (2.90)		−0.697* (−1.95)		0.644** (2.05)		−0.180** (−2.54)	
IV-2		0.051*** (3.80)		−0.121** (−2.23)		0.884** (2.12)		−0.063*** (−3.50)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
City fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Hausman test			23.89 [0.000]	19.44 [0.000]	13.46 [0.003]	10.63 [0.001]	16.56 [0.000]	32.07 [0.000]
KP-wald F statistic			166.38	72.51	133.57	98.09	113.09	80.13
CD-wald F statistic			219.90	79.69	176.12	115.03	150.83	77.32
R-squared			0.436	0.457	0.314	0.262	0.476	0.483
Observations	4,336	4,336	4,336	4,336	4,336	4,336	4,336	4,336

(1) The statistical metrics of the coefficient estimates are shown in parentheses. (2) ***p < 0.01, **p < 0.05, *p < 0.1.

TABLE 5 Results of baseline robustness tests.

Variables	(1) Change the explained variable	(2) 1% tailing treatment	(3) Exclusion of special cities	(4) Shorten the study period
EGT (*price*)		−0.182*** (−8.77)	−0.056** (−2.49)	−0.083* (−1.93)
EGT (*scale*)	0.485*** (3.40)	0.825*** (4.33)	0.711*** (4.72)	0.892*** (5.33)
EGT (*market*)	−0.485*** (−5.56)	−0.073*** (−5.49)	−0.047*** (−4.03)	−0.076*** (−5.65)
Control variables	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
City fixed effects	YES	YES	YES	YES
Observations	4,400	4,400	3,872	3,025

(1) The statistical metrics of the coefficient estimates are shown in parentheses. (2) ***p < 0.01, **p < 0.05, *p < 0.1.

pressure (*lfp*), measured by the ratio of fiscal expenditure to fiscal revenue; industrial structure (*str*), measured by the share of secondary industry in GDP; and industrial land demand fundamentals (*dem*), measured by the number of above-scale industrial enterprises, are introduced into the baseline specification, either individually or jointly, given that these factors may simultaneously affect both the setting of economic growth targets (EGTs) and local governments' industrial land allocation decisions. Table 6 reports the estimation results under alternative model specifications. Column (1) presents the baseline results. Columns (2)–(4) sequentially add fiscal pressure, industrial structure, and industrial land demand fundamentals, respectively, while Column (5) includes all additional controls simultaneously. Across all specifications, the estimated coefficients of EGTs remain stable in sign and statistically significant for industrial land price, allocation scale, and marketization degree. Although the magnitudes of the coefficients exhibit modest attenuation after the inclusion of additional controls, the qualitative patterns are unchanged. These findings suggest that the estimated effects of EGTs on industrial land allocation are not driven by the omission of key fiscal, structural, or demand-side factors. Instead, the core results are robust to alternative model specifications, lending further support to the validity of the baseline conclusions.

4.4 Heterogeneity analysis

4.4.1 Regional heterogeneity

Geographical location, resource endowment, economic foundation, policy environment, and other factors vary considerably across regions. To examine the impact of the EGT on industrial land allocation in different regions, the sample was categorized into three regions: eastern, central, and western. As indicated by Models (1)–(3) in Table 7, the influence of the EGT on industrial land allocation differs across regions. Specifically, EGTs exert a significantly negative impact on industrial land prices across all three regions, with the strongest effect observed in the eastern region, followed by the central and western regions. The impact

TABLE 6 Results of robustness to model specification changes.

Variables	(1) Baseline	(2) + Lfp	(3) +str	(4) + Dem	(5) + All controls
EGT (*price*)	−0.145*** (−6.60)	−0.132*** (−2.63)	−0.146** (−2.33)	−0.143*** (−3.73)	−0.130*** (−5.66)
EGT (*scale*)	0.624*** (6.02)	0.610*** (3.08)	0.611*** (2.89)	0.539*** (4.21)	0.529*** (4.63)
EGT (*market*)	−0.026** (−2.43)	−0.023*** (−3.34)	−0.027*** (−5.02)	−0.020*** (−4.91)	−0.019*** (−2.93)
lfp	NO	YES	NO	NO	YES
str	NO	NO	YES	NO	YES
dem	NO	NO	NO	YES	YES
Control variables	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES
City fixed effects	YES	YES	YES	YES	YES
Observations	4,400	4,400	4,400	4,400	4,400

coefficient in the eastern region is also significantly higher than in the other two regions. EGTs also have a significantly positive impact on the scale of industrial land, and the eastern region is most affected, followed by the western and central regions. Additionally, marketization is severely hampered by EGTs, with the eastern region again experiencing the greatest impact, followed by the central and western regions. The regional heterogeneity of the impact suggests that the eastern region is more affected by EGTs in terms of industrial land allocation, which can be attributed to the region's developed economy, dense clusters of high-end manufacturing and other industries, and strong demand for industrial land while facing land constraints and intense economic competition. Local governments are thus more likely to implement aggressive industrial land allocation strategies to stimulate economic growth under the influence of EGTs. This reinforces the negative effects of EGTs on marketization and industrial land prices while promoting the expansion of industrial land, thereby amplifying their impact on allocation in the eastern region.

4.4.2 Developmental stage heterogeneity

China's economy shifted from a period of rapid growth to a new stage of high-quality development following the 18th National Congress of the Communist Party of China in 2012. The concept of economic development evolved toward a green and sustainable model, and the central government's EGTs were gradually lowered, along with local governments' expectations for economic growth. Considering the period analyzed, the sample was divided into two phases: high-speed development (2007–2012) and high-quality development (2012–2022). The test results in Table 7 for Models (4) and (5) indicate that the impact of EGTs on industrial land allocation varies significantly across different phases of development. As China's economy transitioned from rapid growth to high-quality development, the influence of EGTs on local governments' allocation of industrial land gradually diminished. The adverse effects of EGTs on pricing and marketization also weakened, thereby curbing the disorderly expansion of industrial land. This is because, economic policies place greater emphasis on quality and efficiency in the high-quality development stage. Land management thus becomes more stringent, and the performance appraisal system is adjusted. Local governments then shift from a model of bottom-line competition to one of top-tier competition, thus reducing reliance on land finance and diminishing the influence of EGTs on the allocation of industrial land.

4.4.3 Heterogeneity due to level of industrialization

The impact of EGTs on the allocation of industrial land varies significantly across regions with different levels of industrialization due to differences in resource demands, industrial structures, and economic development patterns. The sample was therefore divided into two groups for further analysis—one with high industrialization and the other with low industrialization—based on whether the level exceeds the median. Models (6)–(7) in Table 7 show that the allocation of industrial land at varying levels of industrialization varies significantly. High-industrialization regions have typically reached the post-industrial stage and thus focus more on intensive land use and industrial upgrading, with relatively less reliance on land prices and the expansion of available land. In contrast, low-industrialization regions rely more on land and capital inputs, with economic growth objectives often achieved through preferential land policies and the expansion of available land. As a result, the negative impact of EGTs on industrial land prices and the positive impact on scale are more pronounced in regions with low industrialization than in those with a high level of industrialization. It is important to note that EGTs have a statistically insignificant positive effect on marketization in highly industrialized regions; this is likely because the eastern region is more market-oriented, has a more developed industrial structure, and relies less on land finance. Adjustments to EGTs thus tend to have a smaller

TABLE 7 Heterogeneity test results.

Variables	Divided by region			Divided by period	
	(1) Eastern region	(2) Central region	(3) Western region	(4) Rapid development stage	(5) High--quality development stage
price	−0.350*** (−5.79)	−0.115*** (−3.95)	−0.098** (−2.28)	−0.237*** (−3.18)	−0.116*** (−5.59)
scale	0.736*** (5.40)	0.432*** (4.86)	0.707*** (7.22)	0.684*** (4.83)	0.337** (2.22)
market	−0.259*** (−3.52)	−0.197*** (−3.02)	−0.180*** (−2.86)	−0.129*** (−3.24)	−0.016* (−1.86)
Control variables	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES
City fixed effects	YES	YES	YES	YES	YES
Observations	1,344	1,280	1,232	1,650	2,750

Variables	Divided by industrialization level		Divided by economic development level	
	(6) High level of industrialization	(7) Low level of industrialization	(8) High level of economic development	(9) Low level of economic development
price	−0.090** (−2.48)	−0.149*** (−3.11)	−0.107*** (−2.65)	−0.114** (−2.15)
scale	0.305*** (3.19)	0.693*** (7.16)	0.342*** (3.14)	0.767*** (8.22)
market	0.077 (0.43)	−0.059** (−2.41)	−0.042*** (−3.05)	−0.061** (−2.08)
Control variables	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
City fixed effects	YES	YES	YES	YES
Observations	1,466	1,467	1,466	1,467

(1) The statistical metrics of the coefficient estimates are shown in parentheses. (2) ***p < 0.01, **p < 0.05, *p < 0.1.

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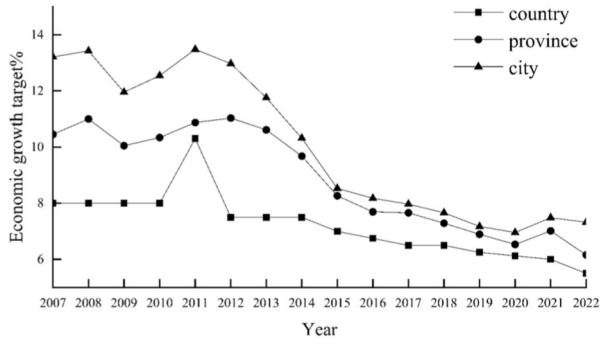


FIGURE 1
Amplification of economic growth targets.

marginal impact on the market-driven allocation of industrial land.

4.4.4 Heterogeneity due to level of economic development

Regions with varying levels of economic development differ in the maturity of their land market mechanisms, industrial structures, land demand, policy orientation, and implementation constraints. This results in variations in the EGT of local governments and their industrial land allocation strategies. The sample was therefore divided into two groups based on whether the economic development level is above or below the median to examine the differentiated impact of EGTs on local government industrial land allocation. Models (8) and (9) in Table 7 illustrate that the impact of EGTs on local government industrial land allocation differs across regions with varying levels of economic development. The impact of the EGT is more noticeable in less economically developed areas than in areas with more economic growth. These regions experience a more significant negative impact on industrial land prices and marketization, while industrial land expansion is also aggravated. This effect is due to the underdeveloped land market mechanisms, lower levels of marketization, and manufacturing-dominated industrial structures in less economically developed regions, which lead to higher demand for industrial land. Under pressure from EGTs, local governments in underdeveloped regions are particularly prone to intervene in industrial land allocation through administrative measures and offer land at low prices and in large quantities to attract investment, promote industrial development, and stimulate economic growth. In contrast, in regions with higher levels of economic development, where the land market mechanisms are more mature, industrial structures are optimized, policy orientation is more sustainable, and land use efficiency is higher, so the impact of EGTs on industrial land allocation is relatively smaller.

5 Further analysis

5.1 Amplification effect of EGTs

The performance appraisal system for local governments often emphasizes short-term economic growth indicators, which can lead to the adoption of more aggressive growth strategies under appraisal pressures. Governments set higher EGTs and intensify policy efforts in areas such as land, taxation, and finance in an attempt to catch up with other regions, and they may even overfulfil the task of economic growth. This leads to a top-down amplification of EGTs from the national to the provincial and municipal levels. In this context, the EGT amplification phenomenon was therefore examined (Figure 1). From 2007 to 2022, the EGT of the country, provinces, and prefectural cities generally exhibited a downward trend over time, with a clear pattern of amplification between the national, provincial, and prefectural levels. The extent of this increase gradually diminished over time.

We constructed two variables to explore the impact of EGT amplification on industrial land allocation: (a) the difference between the city's EGT and the provincial growth target (*Cpgap*) and (b) the difference between the city's EGT and the national growth target (*Ccgap*). The results are presented in Table 8. EGT amplification significantly affects all three dimensions of industrial land allocation—price, scale, and marketization—and the direction of the coefficients aligns with the benchmark regression results. This indicates that EGT amplification significantly influences industrial land allocation. City–province amplification has a greater impact on industrial land allocation than city–national amplification, which is

TABLE 8 Results of the EGT amplification effect.

Variables	*price*		*scale*		*market*	
	(1)	(2)	(3)	(4)	(5)	(6)
CPgap	−0.016*** (−4.63)		0.052*** (6.44)		−0.005*** (−2.78)	
CCgap		−0.013*** (−4.82)		0.046*** (7.33)		−0.004*** (−3.38)
Control variables	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
City fixed effects	YES	YES	YES	YES	YES	YES
R-squared	0.333	0.333	0.144	0.107	0.248	0.249
Observations	4,400	4,400	4,400	4,400	4,400	4,400

(1) The statistical metrics of the coefficient estimates are shown in parentheses. (2) ***p < 0.01, **p < 0.05, *p < 0.1.

TABLE 9 Test results of the EGT constraint effect.

Variables	*price*		*scale*		*market*	
	(1)	(2)	(3)	(4)	(5)	(6)
Hard constraints	−0.027* (−1.88)		0.083** (2.43)		−0.018** (−2.46)	
Soft constraints		0.017 (1.25)		0.032*** (2.95)		0.022*** (3.39)
Control variables	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
City fixed effects	YES	YES	YES	YES	YES	YES
R-squared	0.295	0.291	0.297	0.190	0.185	0.249
Observations	4,400	4,400	4,400	4,400	4,400	4,400

(1) The statistical metrics of the coefficient estimates are shown in parentheses. (2) ***p < 0.01, **p < 0.05, *p < 0.1.

TABLE 10 Global moran index test results.

Year	*EGT*	*price*	*scale*	*market*
2007	0.010***	0.140***	0.177***	0.020***
2008	0.142***	0.221***	0.159***	0.005*
2009	0.161***	0.095***	0.215***	0.024***
2010	0.146***	0.137***	0.229***	0.010***
2011	0.173***	0.211***	0.180***	0.019***
2012	0.177***	0.242***	0.167***	0.023***
2013	0.102***	0.210***	0.195***	0.028***
2014	0.095***	0.174***	0.154***	0.017***
2015	0.139***	0.170***	0.184***	0.013***
2016	0.128***	0.183***	0.161***	0.024***
2017	0.144**	0.200***	0.181***	0.007**
2018	0.164***	0.172***	0.139***	0.025***
2019	0.183***	0.223***	0.161***	0.015***
2020	0.158***	0.183***	0.188***	0.034***
2021	0.146***	0.139***	0.093***	0.031***
2022	0.126***	0.212***	0.124***	0.012***

(1) ***p < 0.01, **p < 0.05, *p < 0.1.

probably because the provincial government plays a more direct and specific role in managing and assessing urban economic development. Provincial governments also have greater autonomy and control over the allocation and management of land resources, and local governments often rely on them for resource support and policy approvals for industrial land allocation. Consequently, local governments are more motivated to coordinate with provincial authorities to secure resources and adjust industrial land allocation to promote EGTs. The multiple levels of resource transmission and coordination at the national level make it more difficult and uncertain for cities to secure the resources necessary for city–national amplification, thereby weakening its impact on industrial land allocation.

5.2 Constraining effects of EGTs

The effects of EGTs result from multiple factors, including the rigidity of the performance appraisal system, financial dependence, resource allocation by higher-level governments, and regional competitive pressure. EGT constraints may therefore arise during the setting of these goals. The government's work report typically includes EGTs modified by adverbs that indicate different levels of constraints on those targets. The government guides economic development by setting targets with varying levels of constraint, and hard constraint targets are typically used to emphasize the urgency and importance of economic growth, while targets with soft constraints offer more flexibility to adapt to economic fluctuations. In line with previous studies, targets modified by adverbs such as "around," "up and down," and "between" are defined as soft constraints, while modifiers such as "to ensure" and "to minimize" indicate hard constraints. Two variables—hard constraints (HC) and soft constraints (SC)—were therefore constructed based on the presence of such modifiers in government work reports to further examine the constraining effect of EGTs on industrial land allocation.

The test results in Table 9 indicate that EGT constraints significantly influence local government industrial land allocation, with notable differences between the effects of hard and soft constraints. Unlike soft constraints, hard constraints exert a strong influence on industrial land prices and scale, as they directly reflect the urgency of local governments' economic growth goals, intensify bottom-up competition, and increase reliance on land finance, thereby amplifying the constraining effect of EGTs. Hard constraints significantly reduce the degree of industrial land marketization, whereas soft constraints facilitate its improvement. This difference arises because soft constraints provide local governments with greater flexibility in decision-making, thus allowing them to leverage market mechanisms more effectively and promoting the marketization of industrial land.

5.3 Spillover effects of EGTs

5.3.1 Spatial autocorrelation test

EGTs are usually set by the government to promote regional economic development through policy measures such as

TABLE 11 Selection results of spatial models.

Model verification method	*price*		*scale*		*market*	
	statistics	*p-values*	*statistics*	*p-values*	*statistics*	*p-values*
LM_Spatial lag	4.569	0.000	6.898	0.014	8.205	0.009
Robust LM_Spatial lag	5.838	0.016	8.053	0.000	10.331	0.000
LM_Spatial error	13.299	0.000	15.349	0.000	21.059	0.000
Robust LM_Spatial error	38.241	0.000	23.675	0.003	33.874	0.000
Wald_Spatial lag	31.950	0.000	27.150	0.000	30.527	0.000
Wald_Spatial error	47.860	0.000	41.740	0.000	44.329	0.005
Hausman	61.470	0.001	61.470	0.000	60.273	0.000
LR_Spatial lag	27.980	0.000	55.220	0.000	35.816	0.000
LR_Spatial error	30.820	0.000	58.690	0.000	37.245	0.002

infrastructure construction, tax incentives, and industrial support. While there are strong connections and interactions in China's regional economic development, there may be synergies or competitions in the industrial land allocation policies of different local governments driven by EGTs. On the one hand, local governments may attract investment by supplying land at low prices and expanding the scale of supply, which leads to resource reallocation in neighboring regions and triggers competitive effects among policies. On the other hand, the synergistic effect of policies may also affect neighboring regions by promoting regional cooperation and development to generate positive spillover effects. The global Moran index of the city's EGTs and local government's industrial land allocation was measured by GeoDa software to identify global spatial correlation characteristics. As shown in Table 10, the global Moran indices of EGTs and industrial land allocation are both significantly positive from 2007 to 2022, which indicates that there is a significant positive global spatial autocorrelation between EGTs and industrial land allocation in the 275 prefectural-level and above cities in China.

5.3.2 Spatial model construction

(1) Construction of spatial matrix. An inverse transportation-distance-based spatial weight matrix was constructed to capture spatial interactions. Compared with contiguity-based or k-nearest-neighbor matrices, this specification avoids arbitrary neighborhood definitions and is therefore more suitable for reflecting spatial competition and policy imitation that extend beyond geographically adjacent cities under China's decentralized governance structure. Specifically, the great-circle distance d_{ij} between the administrative centers of cities i and j is calculated. Based on this distance, the spatial weight matrix is defined as Formula 4:

$$W_{ij} = \begin{cases} \frac{1}{d_{ij}} & if\ i \neq j \\ 0 & if\ i = j \end{cases} \quad (4)$$

The matrix is then row-standardized, such that the elements in each row sum to one. This standardization facilitates coefficient interpretation and ensures the comparability of spatial effects across cities.

(2) Selection of spatial model. To determine the appropriate spatial econometric specification, a series of diagnostic and specification tests are conducted, with the results reported in Table 11. First, Lagrange Multiplier (LM) tests for spatial lag and spatial error dependence, together with their robust counterparts, are performed. According to the conventional decision rule, the simultaneous statistical significance of both spatial lag and spatial error test statistics indicates the presence of multiple forms of spatial dependence, under which neither the SAR model nor the SEM model alone provides an adequate specification. Given the coexistence of spatial lag and spatial error dependence, the Spatial Durbin Model (SDM) is subsequently considered as a more general framework. Wald and Likelihood Ratio (LR) tests are then employed to assess whether the SDM can be simplified to either the SAR or the SEM specification. Based on the rejection of the corresponding null hypotheses at conventional significance levels across all specifications, the restrictions required for model simplification are not supported, implying that the SDM should be retained. In addition, Hausman tests are conducted to determine the appropriate effects specification in the spatial panel framework. Consistent with the standard criterion, the statistically significant test statistics favor the fixed-effects specification. Taken together, the evidence from the diagnostic and specification tests supports the selection of the fixed-effects Spatial Durbin Model for subsequent empirical analysis.

5.3.3 Spatial effect test results

The spatial spillover effects of EGTs on industrial land allocation were further explored using the spatiotemporal double fixed spatial panel Durbin model based on the statistical judgments of LM, Wald, Hausman, and LR of the geospatial weight matrix (W). The test results in Table 12 show that the coefficients for all three dimensions of $W \times EGT$ are significant at the 5% level or better, which indicates that EGTs

TABLE 12 Results of the EGT spatial spillover effect.

Variables	*price*	*scale*	*market*
EGT	−0.009** (−2.08)	0.148** (2.45)	−0.022* (−1.69)
W × *EGT*	−0.344*** (−8.83)	0.400*** (4.00)	−0.042** (−2.06)
Control variables	YES	YES	YES
Year fixed effects	YES	YES	YES
City fixed effects	YES	YES	YES
Direct effect	−0.014** (−1.97)	0.211*** (3.51)	−0.027** (−2.08)
Indirect effect	−0.481*** (−3.13)	1.237*** (6.97)	−0.096*** (−3.00)
Total effect	−0.496*** (−2.51)	1.448*** (8.15)	−0.123*** (−3.97)
R-squared	0.174	0.145	0.320
Observations	4,400	4,400	4,400

(1) The statistical metrics of the coefficient estimates are shown in parentheses. (2) ***p < 0.01, **p < 0.05, *p < 0.1.

have a significant spatial spillover effect on local government industrial land allocation. EGTs not only reduce industrial land prices and marketization levels within a region while increasing its allocation scale but also induce spatial spillovers through market linkages and government competition, thus significantly influencing the industrial land allocation strategies of neighboring regions. This occurs because local governments may lower land prices to attract investment to boost the economy, thus prompting neighboring regions to implement similar expansion strategies. This dynamic intensifies interregional competition for land supply while increasing government administrative intervention, thereby constraining market-driven regulatory mechanisms and ultimately resulting in spatial spillover effects.

6 Conclusions and policy suggestions

6.1 Conclusions

The impact of EGTs on the allocation of industrial land by local governments was systematically examined in this study based on panel data from 275 prefectural-level cities and above in China from 2007 to 2022. This examination yielded three main conclusions. First, the benchmark regression revealed that EGTs have a significant negative impact on the price and marketization of industrial land, and there was a significant positive impact on scale. This conclusion still held after endogeneity treatment and robustness tests. Second, heterogeneity analysis revealed that the impact of EGTs on industrial land allocation by local governments varied significantly across regions, development stages, industrialization levels, and economic development levels. The influence of EGTs on industrial land allocation was more pronounced in the central and western regions, during periods of rapid development, and in areas with low levels of industrialization and economic development. Third, the expanded analysis revealed that EGTs lead to top-down amplification of targets. This phenomenon has a significant negative impact on industrial land prices and marketization while substantially increasing the scale of industrial land allocation. EGT constraints also significantly influence industrial land allocation. Hard constraints negatively affect industrial land marketization, whereas soft constraints facilitate it. Hard constraints exert a stronger negative impact on prices and a more pronounced positive impact on the scale of land allocation than soft constraints. EGTs have a significant spatial spillover effect on industrial land allocation that not only affects local allocation decisions but also influences neighboring regions in the same direction to an even greater extent.

6.2 Policy suggestions

The findings presented above yielded three main policy recommendations. First, the institutional linkage between economic growth target assessments and industrial land supply decisions should be adjusted to curb excessive expansion of land allocation scale and downward pressure on land prices. In particular, growth target evaluations should avoid implicitly encouraging larger volumes or higher frequencies of industrial land grants. At the same time, greater consistency should be enforced in industrial land pricing rules, including stricter oversight of administratively determined prices and clearer limits on non-open bidding transfers, so as to reduce the suppression of land prices and market-based allocation under growth pressure. Second, the design and implementation of industrial land allocation policies should explicitly account for regional and developmental heterogeneity in the effects of growth targets. In regions and cities where growth targets exert stronger influences—such as the central and western regions and areas with lower levels of industrialization and economic development—closer supervision of industrial land supply scale and pricing behavior is warranted. By contrast, in more developed regions, maintaining and strengthening existing market-based allocation practices can help prevent unnecessary administrative intervention in industrial land transactions. Third, adjustments to growth target governance should take into account the

documented top-down amplification and spatial spillover effects. At the vertical level, higher-level governments should moderate the rigidity of target transmission to lower levels, particularly by limiting the use of binding, hard constraints that intensify distortions in industrial land allocation. At the horizontal level, coordination mechanisms among neighboring jurisdictions—such as information sharing on land supply and pricing decisions—should be strengthened to reduce mutually reinforcing expansion of industrial land allocation driven by interregional competition.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

HS: Validation, Conceptualization, Data curation, Formal Analysis, Investigation, Software, Visualization, Writing – original draft. GG: Validation, Funding acquisition, Methodology, Project administration, Resources, Supervision, Writing – review and editing.

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