Strategic defaults in emerging land auctions: A case study in Vietnam

Abstract

Public land auctions are designed to reveal value, allocate land to capable developers, and support urban growth. In financialized land markets, however, auction prices can also become signals that reshape collateral values, investor expectations, and nearby land prices. This paper develops a *speculative-signaling hypothesis*: when deposits are fixed to the reserve price, a bidder with large external asset exposure may profit from aggressive overbidding, generate a valuation shock, and then default at limited cost. We study the 2021 Thủ Thiêm auctions in Ho Chi Minh City, where four plots attracted extraordinary bids yet all ended in default. We complement this evidence with suburban Hanoi auctions in 2024, where most awarded lots remained unpaid. Equity-market reactions, spatially differentiated stock-price sensitivity, extreme bid premia, and repeated settlement failures support a speculative-signaling interpretation. The urban opportunity cost is substantial: unsettled benchmarks can delay nearby land assembly, site clearance, and project delivery. A stylized auction model and calibrated simulations show that dynamic, bid-pegged deposits substantially reduce strategic overbidding by making default costs rise with the signal strength. The central policy lesson is that auctions must price not only land, but also the signal the winning bid creates.

Keywords: Land governance, Land financialization, Land auctions, Strategic default, overbidding incentive, Price signaling

1. Introduction

Over the past thirty years, the marketization of land rights has played a pivotal role in Vietnam's economic transformation. The *Đổi Mới* (Renovation) reforms shifted land from an administratively allocated resource to a tradable asset, supporting urban growth, capital formation, and strengthening fiscal capacity (Labbé, 2011; Gillespie, 1994; Ravallion and van de Walle, 2008). Central to this transformation are public land auctions, theoretically favored for transparency and allocative efficiency (Milgrom, 2004; Klemperer, 2004). However, as land markets increasingly intertwine with complex financial systems, land and housing function not only as inputs for development, but also as stores of value, collateral for credit, and speculative assets (Labbé and Musil, 2014; Aalbers, 2016a).

This paper investigates a potential structural weakness in Vietnam's land market governance: the susceptibility of standard auctions to speculative price signaling. We examine whether real estate firms with substantial external asset exposure may have incentives to bid not only to acquire the auctioned parcel, but also to generate price signals that affect the valuation of broader land banks, collateral portfolios, and investor expectations. While the

Figure 1: **Four land plots in the 2021 Thủ Thiêm auctions.** The aerial view details zones 3-5, 3-8, 3-9, and 3-12, which were subject to speculative bidding and default. *Source: Adapted from Lao Dong Newspaper.*

financialization literature documents the downstream effects of speculative cycles, such as credit expansion and planning distortions that propagate through valuation systems (Harvey, 2006; Christophers, 2017; Shatkin, 2017), the upstream auction rules that may make such signaling privately attractive remain less well understood. Beyond Vietnam, similar vulnerabilities may arise in emerging economies such as China, Malaysia, and Indonesia, where state land auctions, real estate leverage, and financial markets intersect.

We help close this gap by examining the four Thủ Thiêm auctions in Ho Chi Minh City in 2021. As illustrated in Figure 1, these adjacent, undeveloped parcels (Lots 3-5, 3-8, 3-9, and 3-12) became the epicenter of extreme bidding, with winning bids far surpassing their starting prices. Most drastically, Lot 3-12 escalated from a reserve of 2.9 trillion VND to 24.5 trillion VND. This implied a record valuation of approximately US$106,000 per square meter, placing the unbuilt peninsula in the range of prime real estate locations in Manhattan and Tokyo. However, this price signal was followed by default across all four plots (Vietnam Investment Review, 2022; Viet Nam News, 2022). Rather than attributing the four defaults to the winner's curse, we argue that they reveal a deeper auction-design vulnerability. Capping deposits at the reserve price while allowing bids to escalate without a corresponding increase in default exposure can create a low-cost option on broader asset revaluation.

To assess whether Thủ Thiêm was part of a broader vulnerability in Vietnam's land auction system, we assemble a dataset of 118 high-stakes land auctions. The dataset covers the four Thủ Thiêm cases in 2021 and three complementary suburban Hanoi auction events in 2024.[1] Across Hanoi events, 114 lots were auctioned, but only 28 were fully paid; the

[1]The Hanoi cases involve small residential land-use-right lots (*đất ở*). Because Hanoi and Ho Chi Minh City are Vietnam's two largest urban markets, land-price shocks in these cities carry national significance.

remaining 86 were forfeited or defaulted. This variation allows us to understand when auction prices may become speculative signals. The external validity of our overbidding hypothesis is further supported by evidence from Chinese land markets, where auction bids can spill over to nearby land and housing prices, shape developer expectations, and operate as valuation benchmarks (Wu, Gyourko, and Deng, 2012; Fang, Gu, Xiong, and Zhou, 2016; Zheng and Kahn, 2008).[2] We then formalize the bidding incentives by an auction model in which genuine developers compete with a bidder who benefits from external portfolio revaluation.

Our analysis makes four main contributions. First, we establish a condition under which a *pump-then-default equilibrium* emerges. We show that when fixed deposit rules intersect with strong external asset sensitivity, bidding beyond the bidder's intrinsic land value can arise as part of a Nash equilibrium. The model also reveals two paradoxes. The *Competition Paradox* shows that genuine developers may inadvertently provide a liquidity shield for speculative bidders by sustaining the auction long enough for the price signal to rise. The *Revenue Paradox* shows that, under some parameter values, the state may receive higher short-run revenue from default forfeitures than from a successful sale at fundamental value, creating a fiscal incentive that can conflict with project delivery and urban planning objectives.

Second, we propose a *dynamic deposit rule* to correct this incentive distortion. By legally pegging the bid bond to the live auction price, this rule makes the cost of default rise with the strength of the price signal. It therefore reduces the cheap-option feature of fixed deposits and forces bidders to internalize more of the cost of speculative escalation. Because the rule does not require the state to determine the land's fundamental value, it is particularly useful in contexts with limited administrative capacity (Posner and Weyl, 2018).

Third, we combine comparative case evidence with calibrated simulations. The empirical analysis covers four major Thủ Thiêm auctions in 2021 and 114 premium residential lots auctioned across three suburban Hanoi events in 2024. This broader evidence allows us to compare extreme price escalation followed by default or non-payment with high-premium cases that were reportedly paid, separating bid inflation from settlement failure. We then calibrate the model to the observed auction rules and bid magnitudes and run Monte Carlo simulations to illustrate its policy implications. Under the baseline calibration, fixed reserve-pegged deposits generate frequent strategic overbidding and default outcomes, while dynamic bid-pegged deposits substantially reduce these incentives. Sensitivity checks vary bidder numbers, valuation dispersion, deposit ratios, and external asset exposure.

The Hanoi events comprised 68 lots in Thanh Oai, 19 in Hoài Đức, and 27 in Hà Đông; 28 were fully paid, while 86 were unpaid, forfeited, or defaulted.

[2]In China, major-city land auctions in Beijing, Shanghai, and Shenzhen have produced "Land King" episodes, where record bids became benchmarks for market expectations. During the 2015 to 2017 credit expansion, developers such as Evergrande and Sunac expanded through debt-financed land acquisition, using land reserves as collateral. These episodes suggest that benchmark-setting incentives can arise when public auction prices interact with leveraged developer balance sheets.

Finally, we link these dynamics to urban planning and land governance. Distorted auction outcomes widen the wedge between compensation expectations and feasible development values, slowing land assembly, site clearance, and public works (Labbé and Musil, 2014; Doan, 2023). To address these potential failures, we *propose* a reform package that includes dynamic deposits, shorter settlement protocols to reduce the duration of unsettled price signals, and prudential firewalls to prevent unsettled auction results from entering collateral valuation, bond issuance, and official appraisal benchmarks. We also discuss feasibility, enforcement costs, legal constraints, and liquidity burdens on genuine developers.

The paper proceeds as follows. Section 2 reviews the literature. Section 3 presents the Thủ Thiêm auctions as the focal cases. Section 4 develops the game-theoretic framework and equilibrium analysis, which we then calibrate and simulate in Section 5. Section 6 outlines the relevant legal context and reform proposals. Proofs are relegated to Appendix A.

2. Literature review

This paper situates strategic overbidding and default at the intersection of auction design, strategic signaling, land governance, and the financialization of urban land.

The limits of standard auction theory

Auctions are theoretically favored for their transparency and allocative efficiency, ensuring land flows to the developer with the highest valuation (Milgrom, 2004; Klemperer, 2004). In land markets, auction outcomes also serve as signals of market sentiment and expected price trajectories (Xie, Parsa, and Redding, 2002; Ching and Fu, 2003). Standard theory predicts that rational bidders exit once prices exceed their private valuations (Vickrey, 1961).

Yet persistent overbidding in land auctions challenges this prediction (Ooi, Sirmans, and Turnbull, 2006). Existing explanations emphasize the winner's curse, attributing overbidding to common-value uncertainty, over-optimism, or cognitive bias (Kagel and Levin, 1986; Thaler, 1988). These explanations remain important, but they are incomplete in financialized settings where auction outcomes may also shape collateral values, investor expectations, and planning benchmarks (Haila, 2000). Evidence from Chinese land markets shows that record-breaking bids can reset expectations and generate spillovers to nearby land and housing prices (Wu, Gyourko, and Deng, 2012; Fang, Gu, Xiong, and Zhou, 2016). In such contexts, bidding may reflect not only miscalculation about the auctioned parcel, but also incentives to influence external valuations. While land price dynamics are well studied (Mayer, 1995, 1998), less attention has been paid to auction rules that allow bids to operate as signals before payment is verified. Our contribution is to identify and formalize this complementary channel based on toehold-style incentives and assess its empirical plausibility.

Strategic externalities and "toehold" incentives

To explain strategic overbidding, we draw on the toehold literature in corporate takeovers, where bidders may overpay to increase the value of existing positions (Burkart, 1995; Bulow, Huang, and Klemperer, 1999). In land and real estate markets, similar incentives may arise through exposure to nearby assets, land banks, or collateral portfolios. Auction prices can then act as public signals that reshape expectations and balance sheet valuations, consistent with costly signaling models (Spence, 1973).

Auction design literature shows that rational equilibrium predictions may change when bidders care about outcomes beyond allocation, such as the winning price or the identity of the winner (Jehiel and Moldovanu, 1996). We extend this insight to financialized land markets, where externalities can be generated by the auction price itself. In such settings, real estate bidders with external asset exposure may have incentives to use auction bids not only to acquire land, but also to influence valuation benchmarks. This can create a feedback loop in which higher bids raise reference prices, improve perceived portfolio values, and sustain further bidding. The implication for land governance is important: auctions may shift from pure allocation devices toward instruments of speculative price signaling, particularly when payment is delayed and default penalties are capped.

Land governance, financialization, and Vietnam's auction benchmarks

Land auctions are also institutions of governance. They shape who acquires land, how land is valued, and how urban development is financed. In financialized markets, land is simultaneously a development input, a store of value, and collateral (Aalbers, 2016b; Fernandez and Aalbers, 2016). Prices are therefore not merely discovered; they are constructed through institutional linkages among valuation, credit, and state authority (Christophers, 2017). When unsettled auction prices circulate as benchmarks, genuine developers may be crowded out, while land is temporarily allocated to actors whose returns depend more on financial gains than project delivery (Strange, 1986; Dong and Sing, 2016).

Vietnam makes this benchmark channel particularly salient. Under the Constitution and Land Laws, the State owns all land and grants private actors tradable, time-limited Land Use Rights (LURs) (National Assembly of Vietnam, 2013a,b, 2024). Because private transaction data are scarce and the official land-price framework often diverges from market prices, public LUR auctions carry disproportionate institutional authority (Gillespie, 1994; Labbé, 2011; Vo, 2011; Labbé and Musil, 2014). Auction outcomes can enter compensation standards, appraisal practice, land assembly negotiations, and planning expectations, especially where official valuations rely on comparative methods (Doan, 2023; Thien Thu and Perera, 2011; Tuan, 2023). As land increasingly serves as collateral, auction prices may also affect credit conditions and perceived borrowing capacity (World Bank, 2022). These links strengthened during the expansion of debt-financed real estate activity under Decree No. 153/2020/ND-CP (Government of Vietnam, 2020b).

Vietnam's dynamics are part of a wider pattern across state-mediated land markets in the Global South, where valuation events can shape leverage, secondary market expectations, and urban growth (Fix, Arantes, and Tanaka, 2003; Sanfelici, 2013; Searle, 2016). China's "Land King" phenomenon illustrates how record land bids can reset market expectations and stimulate nearby property markets (Wu, Gyourko, and Deng, 2012; Fang, Gu, Xiong, and Zhou, 2016), while land-finance dependence can affect urban efficiency and spatial expansion (Fan, Qiu, and Sun, 2020). What remains underexplored is the link between benchmark effects and default incentives. We identify this channel by combining high-stakes auction evidence with a game-theoretic model showing how fixed deposits, delayed settlement, and limited default exposure can make overbidding privately attractive in financialized land markets.

3. Empirical setting and evidence

We start by assembling a dataset of high-stakes land auctions. The empirical analysis of these cases reveals the anatomy of the Thủ Thiêm valuation shock and provides evidence consistent with speculative price signaling. We then construct a game-theoretic model to translate these qualitative observations into a formal equilibrium framework.

3.1. Case selection

Table 1: Summary of high-premium land auctions and settlement outcomes

Case	Date	Unit	Land-use type	Parcel size (m^2)	Winner	Reserve (VND bn)	Winning bid (VND bn)	Premium (%)	Settlement outcome	Reported benchmark effect
TT-3-5	Dec 2021	1 plot	Mixed-use	6,446	Dream Republic Corporation	578.042	3,820.000	560.9	Default and deposit forfeiture	Reported rise in nearby asking prices and Thủ Thiêm benchmark expectations.
TT-3-8	Dec 2021	1 plot	Mixed-use	8,568	Sheen Mega JSC	1,016.458	4,000.000	292.7	Default and deposit forfeiture	Same Thủ Thiêm benchmark shock; surrounding prices rose while liquidity thinned.
TT-3-9	Dec 2021	1 plot	Mixed-use	5,009.1	Binh Minh Investment and Trading Co., Ltd.	730.227	5,035.000	589.5	Default and deposit forfeiture	Same Thủ Thiêm benchmark shock, with local asking-price adjustment and market debate.
TT-3-12	Dec 2021	1 plot	Mixed-use	10,059.7	Viet Star Real Estate Investment Co., Ltd. (Tan Hoang Minh Group)	2,942.297	24,500.000	732.7	Default and deposit forfeiture; later corporate bond fraud proceedings involving Tan Hoang Minh Group	Record price signal; strongest equity-market and local valuation response.
Thanh Oai	Aug 2024	68 lots	Residential	64.95	Individual investors	0.817	6.532	699.8	Widespread default: 12 paid, 56 unpaid or defaulted	Immediate resale attempts and local asking-price increases.
Hoài Đức	Aug 2024	19 lots	Residential	113.27	Individual investors	0.839	15.099	1,700.1	Mixed settlement: 11 paid, 8 unpaid or defaulted	High winning prices became local reference points; some lots were paid.
Hà Đông	Oct 2024	27 lots	Residential	57.5	Individual investors	1.852	15.065	713.7	Widespread default: 5 paid, 22 unpaid or defaulted	Immediate resale attempts and benchmark effects were reported.

Notes: TT denotes Thủ Thiêm. Premium is calculated as (winning bid/reserve price -1) $\times$ 100. For the Hanoi events, parcel size, reserve and winning-bid values refer to the *representative highest-price lot* reported for each auction event, while settlement outcomes are reported at the aggregate level. The Hanoi events involve many small residential land-use-right lots.

As summarized in Table 1, our dataset draws on administrative records, official announcements where available, and market reports. It includes four adjacent prime plots auctioned in Ho Chi Minh City's Thủ Thiêm peninsula in December 2021 (Lots 3-5, 3-8, 3-9, and 3-12), and three complementary suburban Hanoi auction events held in late 2024, in Thanh Oai, Hoài Đức, and Hà Đông. We selected these cases across three dimensions: extreme bid

escalation, reported local price spillovers, and observable post-auction outcomes. Across the dataset, winning bids far exceeded reserve prices, with premiums ranging from nearly 300% to above 1,700%, generating visible local market responses and public debate. The dataset is purposive rather than representative: it is designed to study high-stress auctions, not to estimate the national prevalence of default. This design nevertheless provides useful variation in final settlements. While all four Thủ Thiêm plots and many Hanoi lots ended in default or non-payment, some high-premium Hanoi lots were ultimately paid.

While the Hanoi events show that rapid benchmark effects are not unique to Thủ Thiêm, the four 2021 Thủ Thiêm auctions provide the clearest setting for detailed analysis because all four plots combined bid escalation with subsequent default. Among these, we focus our preliminary analysis on Plot 3-12, the largest shock in the auction sequence. We then return to the other Thủ Thiêm plots and the Hanoi cases in the comparative empirical analysis.

3.2. The focal valuation shock of Plot 3-12

Figure 2: **The Thủ Thiêm Auction Site.** The map highlights Lot 3-12 within the New Urban Area master plan. This specific location was the subject of the anomalous bidding event and subsequent default. *Source: Adapted from Sasaki.*

The focal observation of our empirical setting is the valuation shock of Plot 3-12, a parcel of 10,059 square meters in the Thủ Thiêm New Urban Area, as shown in Figure 2. The Ho Chi Minh City Property Auction Service Center initially set the reserve price at 2.9 trillion VND (US$128 million),[3] a figure already considered ambitious given the peninsula's

[3]All USD figures use an approximate exchange rate of 22,976 VND per US dollar in 2021, consistent with the conversions reported for the Plot 3-12 reserve price and winning bid.

Figure 3: **Panoramic view of Thủ Thiêm New Urban Area.** The sharp contrast between the undeveloped peninsula and the dense CBD illustrates the area's delayed urbanization. *Source: Thu Thiem Zeit.*

undeveloped state. However, following seventy rounds of rapid-fire bidding among Vietnam's largest real estate conglomerates, the highest bid reached 24.5 trillion VND (approximately US$1.1 billion). The winning entity was Viet Star Real Estate Investment Co., Ltd., a member of the Tan Hoang Minh Group ecosystem.[4]

This winning bid implied a land value of nearly 2.44 billion VND, or US$106,000 per square meter. As shown in Figure 3, this valuation applies to a peninsula that, despite its proximity to the center, is visually distinct from the dense District 1 across the river. To give context, despite Thủ Thiêm still lacking full sewerage and transport infrastructure, its price per square meter nominally eclipsed valuations in the world's top financial centers, including Tokyo's Ginza, Hong Kong's Central, and Manhattan's Fifth Avenue.

The settlement failure of Plot 3-12 occurred roughly one month later, on January 10, 2022, when the developer unilaterally requested contract termination. In a direct letter to the Prime Minister and General Secretary, the Chairman voluntarily accepted forfeiture of the 600 billion VND (US$26 million) deposit, citing "domestic market instability" (Viet Nam News, 2022). He also stated that the aggressive bid was motivated by "national pride" to prevent foreign acquisition, while arguing that completing the transaction would place severe pressure on the real estate sector (Vietnam Investment Review, 2022).

In auction theory, such a default could be interpreted as a winner's curse: a severe overestimation of common value (Thaler, 1988; Kagel and Levin, 1986). We do not rule out this explanation. Rather, we argue that the observed sequence is also consistent with

[4]The winning bid surpassed the final offer from Capital One Financial, a Chinese investor, who had proposed approximately US$1 billion for the plot before withdrawing (Vietnam Investment Review, 2022).

strategic price signaling. Subsequent legal proceedings concerning Tan Hoang Minh Group's corporate bond issuance provide important institutional background: the group was later found to have mobilized roughly 10 trillion VND from nearly 6,600 retail investors through bond issuance (Viet Nam News, 2024). These proceedings underscore why a public land-price benchmark could have been valuable for a highly leveraged real estate group. The record-breaking auction price created a salient valuation signal that may have affected investor expectations, perceived collateral values, and market assessments of balance-sheet strength. In this explanation, the forfeited deposit was not merely a penalty for overoptimism, but the limited downside cost of generating a temporary public price signal.

3.3. Comparative auction evidence: Thủ Thiêm plots and Hanoi events

Plot 3-12 was the most visible case, but it was not an isolated high bid within the auction sequence. All four Thủ Thiêm plots received winning bids far above their reserve prices and all later ended in default or non-payment. Figure 4 shows the scale of the Thủ Thiêm shock within Ho Chi Minh City's land market. The Plot 3-12 bid priced an undeveloped parcel above prime land in the Central Business District, overturning the city's usual spatial price hierarchy. The anomaly is difficult to justify through ordinary infrastructure-led appreciation, since the bid far exceeds the one-third value uplift typically associated with infrastructure improvements (Tang and Lo, 2008). Market analysis by the Ho Chi Minh City Real Estate Association (HoREA) confirms that the bid was insolvent from inception: at 2.43 billion VND/m^2, the land price implied a break-even residential price of roughly 400 million VND/m^2, far exceeding existing luxury benchmarks.

Figure 5 situates the Thủ Thiêm auctions and the Hanoi events within a national reference set of land auctions. In the comparison provinces, winning-bid premiums range from 17% to 86%, a band consistent with ordinary variation in local land demand. Thủ Thiêm and Hanoi lie well beyond this range. All four Thủ Thiêm plots exceed the provincial benchmark by a large margin, with premiums ranging from nearly 300% to more than 730%. The Hanoi events are still more striking. Although they involved small residential land-use-right lots rather than large mixed-use development parcels, the highest reported premiums reached nearly 700% in Thanh Oai, 714% in Hà Đông, and 1,700% in Hoài Đức.

The Hanoi events provide two useful tests of the speculative-signaling hypothesis. First, they separate price escalation from settlement failure. Across Thanh Oai, Hoài Đức, and Hà Đông, 114 lots were auctioned: 68 in Thanh Oai, 19 in Hoài Đức, and 27 in Hà Đông. Settlement outcomes varied sharply. In Thanh Oai, only 12 of 68 winners paid in full, and the paid lots were concentrated below roughly 55 million VND/m^2, while the highest-price lots appear not to have settled. In Hoài Đức, by contrast, 11 of 19 lots were paid, including the top bid of 133.3 million VND/m^2. In Hà Đông, only 5 of 27 lots settled, but the highest-price lot, at about 262 million VND/m^2, was among them. This heterogeneity matters: extreme bids alone do not prove a pump-then-default strategy, since some high-price bidders

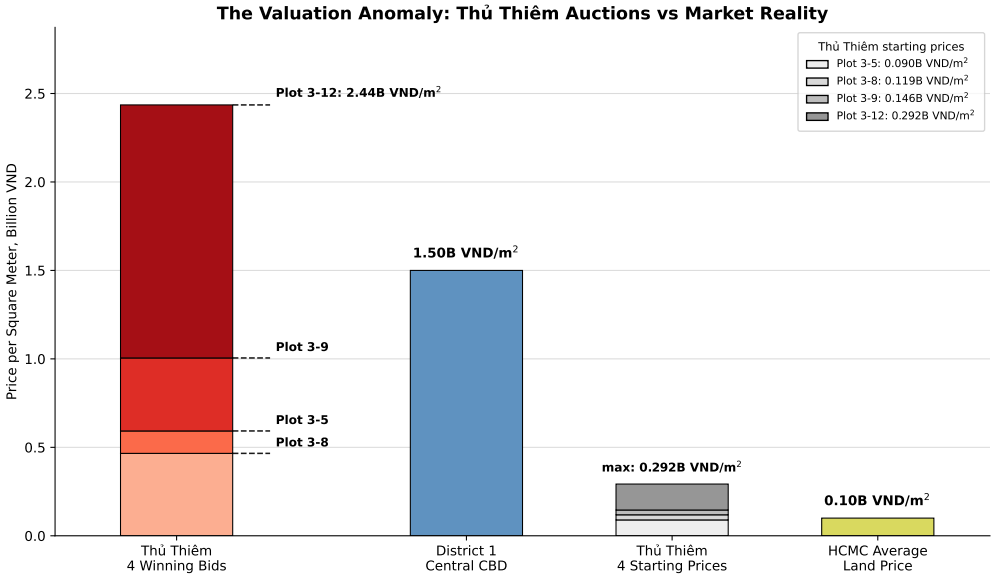

Figure 4: **The valuation anomaly across the four Thủ Thiêm plots.** The Thủ Thiêm bar shows plot-level winning bids as threshold segments, with Plot 3-12 reaching 2.44 billion VND/m^2. Comparison bars report District 1 prime land prices, the Thủ Thiêm reserve price, and the HCMC average benchmark. *Data sources: official auction results; The Saigon Times.*

did complete payment. They do, however, show that auction prices can become unusually strong valuation signals even when subsequent settlement is uncertain.

Second, immediate resale attempts are consistent with speculative signaling. Reports indicate that many winning claims were marketed almost immediately after auction, often at substantial premia over the winning price. In Hoài Đức, newly won lots were reportedly offered for resale at premia of 300 to 800 million VND per lot, including the 133.3 million VND/m^2 top-price lot (Dân trí, 2024). In Thanh Oai, winning lots were also advertised shortly after the auction at premia of roughly 300 to 500 million VND per lot, although the premia quickly fell as market interest weakened (Dân trí, 2024; Báo Đầu Tư, 2024). In Hà Đông, brokers reportedly marketed auctioned lots at premia of 500 to 600 million VND per lot (VOV Live, 2024). Therefore, the bidder's immediate objective is not necessarily development or long-term occupation, but the rapid monetization of the auction result itself.

3.4. Market response and signal sensitivity

If Thủ Thiêm auctions operated as price signals, the strongest stock-market response should appear among firms most exposed to the relevant spatial or collateral channel. The four auction winners are privately held developers and therefore have no observable public stock prices. We therefore examine three other listed real estate firms with different exposure to the Thủ Thiêm signal. Auction news carries unusual informational weight in Vietnam because private property transactions are not recorded in a transparent public price database, making public land auctions especially salient valuation benchmarks.

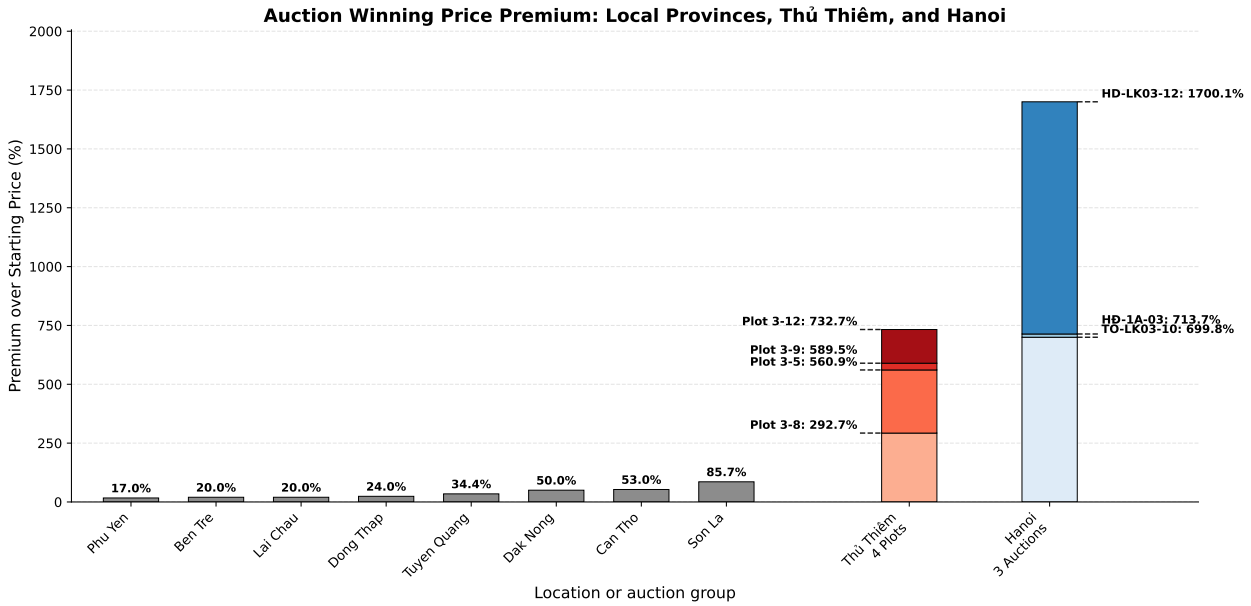

Figure 5: **The decoupling of land value.** While comparable auctions show winning-bid premiums of roughly 17% to 86% across the nation, all four Thủ Thiêm winning bids lie far above this range. These four outliers indicate valuations detached from ordinary residential land-price discovery and consistent with unusually strong benchmark effects. *Data source: official auction results, Vietnamnet.*

CII is the highest-exposure case because its project interests are located in Thủ Thiêm itself. DIG is treated as medium exposure because investors associated its large undeveloped land bank, including Long Tân in Nhơn Trạch, Đồng Nai, with the eastern metropolitan growth corridor running from central Ho Chi Minh City through Thủ Thiêm toward peri-urban expansion zones. DXG provides a lower-exposure comparison: its Nam Rạch Chiếc projects are geographically close to Thủ Thiêm, but are better interpreted as adjacent, project-specific exposure within the East Ho Chi Minh City market.[5]

Figure 6 shows a clear exposure gradient. During the roughly one-month auction-to-default window, the VN-Index largely plateaued, while CII rose the most, DIG also increased sharply, and DXG responded more modestly. The divergence is difficult to explain as a market-wide movement. It points instead to a speculative feedback loop in which the record bid acted as a collateral-channel shock, lifting perceived land-bank values, easing expected financing constraints, and drawing in extrapolative trading until the signal lost credibility (Long et al., 1990; Case and Shiller, 1989; Kiyotaki and Moore, 1997).

To quantify this exposure gradient, we conduct a two-step event-study design. The first step removes market-wide movements from each firm's return. For each firm $i \in$

[5]Full names: CII, Ho Chi Minh City Infrastructure Investment Joint Stock Company; DIG, Development Investment Construction Joint Stock Corporation; DXG, Đất Xanh Group Joint Stock Company.

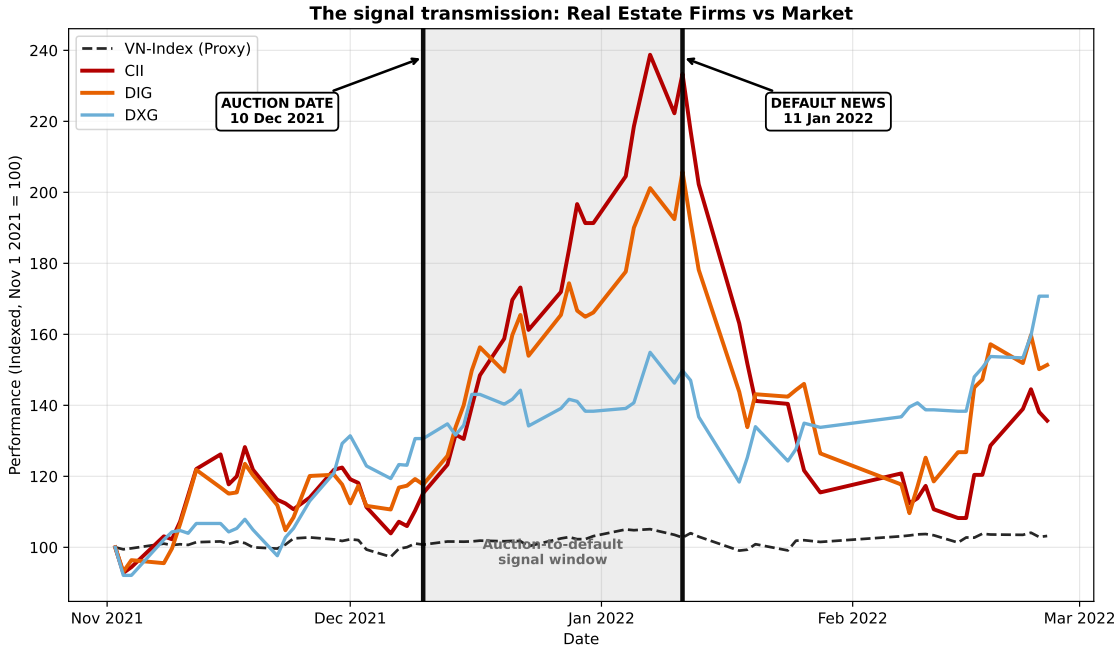

Figure 6: **The signal transmission.** Stock performance of CII, DIG, and DXG relative to the market-wide VN-Index from November 2021 to February 2022. All initial prices are normalized to 100. Vertical lines indicate the auction date and the default-news date. *Data source: Yahoo Finance.*

$\{\text{CII}, \text{DIG}, \text{DXG}\}$, we estimate a market model using daily log returns:

$$r_{it} = \alpha_i + \beta_i r_{mt} + \varepsilon_{it}, \tag{1}$$

where $r_{it} = \Delta \log(P_{it})$ is firm i's daily log return and r_{mt} is the VN-Index log return. The model is estimated over the pre-auction window, before the Thủ Thiêm signal entered the market. We then construct estimated abnormal returns,

$$\widehat{AR}_{it} = r_{it} - \hat{\alpha}_i - \hat{\beta}_i r_{mt}, \tag{2}$$

which measure each firm's return after netting out broad market variation. This allows us to ask whether the auction and default news were capitalized most strongly by firms with greater spatial or collateral exposure to the Thủ Thiêm event.

The second step measures how the auction and default news were capitalized by each firm after market-wide variation has been stripped out. For each firm, we report the average daily abnormal return during the auction-to-default window, $\overline{\widehat{AR}}_i^{A} = |W_A|^{-1} \sum_{t \in W_A} \widehat{AR}_{it}$, the one-day abnormal return after the auction news, $\widehat{AR}_{i,t_A}$, the one-day abnormal return after the default news, $\widehat{AR}_{i,t_D}$, and the cumulative abnormal return over the post-default window, $CAR_i^D(H) = \sum_{k=0}^{H-1} \widehat{AR}_{i,t_D+k}$. In the main specification, $H = 30$ trading days. This design first purges broad market movements, then asks whether the Thủ Thiêm signal was priced most strongly by firms with greater spatial or collateral exposure to the auction benchmark.

Table 2: Market-adjusted stock responses around the Thủ Thiêm auction

Panel A. First-stage market-model regressions

Firm	$\hat{\alpha}_i$	$\hat{\beta}_i$	R^2	Observations
CII	0.0027	0.6775	0.0626	130
DIG	0.0061	1.0756	0.1108	130
DXG	0.0014	1.1861	0.1742	130

Panel B. Event responses after removing market-wide variation

Event window	Measure	CII	DIG	DXG
After auction news	Raw return	6.98	6.86	3.18
13 Dec 2021	Market-adjusted return	6.07	5.23	1.98
Full auction-to-default window	Raw cumulative return	92.84	63.50	11.95
13 Dec 2021 to 10 Jan 2022	Market-adjusted cumulative return	78.99	39.67	5.28
After default news	Raw return	-6.89	-6.93	-1.85
12 Jan 2022	Market-adjusted return	-7.90	-8.69	-3.38
Thirty trading days after default news	Raw cumulative return	-40.46	-26.21	2.37
12 Jan 2022 to 22 Feb 2022	Market-adjusted cumulative return	-45.33	-39.07	-2.69

Notes: Panel A reports firm-specific OLS estimates from the market model $r_{it} = \alpha_i + \beta_i r_{mt} + \varepsilon_{it}$, estimated over the pre-auction window from 1 June 2021 to 30 November 2021. Returns are daily log returns, and r_{mt} is the VN-Index proxy return. Panel B reports raw and market-adjusted event responses in percent. Estimated abnormal returns are defined as $\widehat{AR}_{it} = r_{it} - \hat{\alpha}_i - \hat{\beta}_i r_{mt}$. The auction was held on 10 December 2021; because 11 and 12 December were not trading days, the first post-auction return is measured on 13 December 2021. The one-day return after default news is measured on 12 January 2022. For multi-day windows, entries are cumulative returns converted from log points to percentages.

Table 2 shows that the Thủ Thiêm signal was capitalized unevenly across listed real estate firms. On the first trading day after the auction news, CII and DIG recorded large market-adjusted returns of 6.07% and 5.23%, respectively, while DXG rose by only 1.98%. Over the full auction-to-default window, the exposure gradient becomes stronger: CII accumulated a market-adjusted return of 78.99%, DIG 39.67%, and DXG only 5.28%. The pattern reversed after the default news. On 12 January 2022, market-adjusted returns fell by 7.90% for CII, 8.69% for DIG, and 3.38% for DXG. Over the following 30 trading days, cumulative market-adjusted returns declined by 45.33% for CII and 39.07% for DIG, compared with only 2.69% for DXG. This ordering provides evidence of signal transmission: investors responded most strongly where the auction benchmark was most likely to affect perceived land-bank values, collateral capacity, and financing prospects. The magnitude and reversal of these responses clarify why a bidder with sufficiently large external exposure could have an incentive to exploit auction-price sensitivity during the settlement window.

4. A model of speculative bidding behavior

Motivated by the Thủ Thiêm settlement failures, we develop a model of an open ascending land auction in which a bidder may value the auction price as a public signal, not only the

parcel itself. We identify the conditions under which bidding beyond intrinsic land value can be privately rational when the auction price affects external asset values.

4.1. Environment

Consider an ascending clock auction for a land-use-right parcel with reserve price $r > 0$. There are $N \geq 2$ genuine developers, indexed by $i = 1, \ldots, N$, and one external-value bidder, denoted by M. Each genuine developer has a private development value v_i, drawn independently from a continuous distribution F with density f, survival function $S(p) = 1-F(p)$, and hazard rate $h(p) = f(p)/S(p)$. In a standard private-value English auction, each genuine developer remains active until the price reaches v_i, so the highest-valuing developer wins and the price is pinned down by the second-highest valuation.

Bidder M has intrinsic land value v_M, but also holds external assets whose perceived value may rise when the auction price exceeds the reserve. Let p denote the standing bid and $p-r$ the auction premium. The external valuation gain is $B(p-r)$, where $B(0) = 0$, $B' \geq 0$, and B is differentiable. In the linear benchmark used later for calibration, $B(p-r) = b(p-r)$, where $b = A\theta$ summarizes external asset exposure A and signal sensitivity θ.

If M loses at price p, it receives $B(p-r)$. If M wins and settles, it receives $v_M - p + B(p-r)$. If M wins and defaults, it receives $B(p-r) - \kappa(p)$, where $\kappa(p)$ is the total cost of default. This cost includes the forfeited deposit and, in richer institutional settings, legal, regulatory, reputational, or financing penalties. The payoff from winning is therefore $B(p-r) + \max\{v_M - p, -\kappa(p)\}$.

The relevant downside from accidentally winning, relative to losing at the same price, is $L(p;\kappa) \equiv -\max\{v_M - p, -\kappa(p)\} = \min\{p - v_M, \kappa(p)\}$. When $p < v_M$, winning may still be intrinsically valuable, so this term can be negative. When $p > v_M$, accidental winning is costly. In the default region, defined by $p - v_M \geq \kappa(p)$, the loss from accidental winning is simply $L(p;\kappa) = \kappa(p)$.

The central strategic problem arises in the final-duel stage, when only one genuine developer remains active against M. At price p, the marginal benefit from raising the signal is $B'(p-r)$. The expected marginal cost of accidentally winning is $h(p)L(p;\kappa)$, because $h(p)$ is the conditional probability density that the last genuine developer exits at that price. Hence the local continuation condition is $B'(p-r) \geq h(p)L(p;\kappa)$.

Claim 1 (Continuation condition)**.** *In the final-duel stage, raising the stopping threshold at price p is locally profitable for M if and only if $B'(p-r) \geq h(p)L(p;\kappa)$. In the default region, this condition reduces to $B'(p-r) \geq h(p)\kappa(p)$.*

This condition is the key object of the model. It says that continued bidding is privately attractive when the marginal external gain from a higher public auction premium exceeds the default cost weighted by the risk of accidentally winning.

4.2. Fixed reserve-pegged deposits

Under the status quo fixed-deposit rule, the default cost is tied to the reserve price rather than the live bid. Let $\kappa_F(p) = \rho r$, where $\rho \in (0,1)$ is the statutory deposit ratio. The effective deposit ratio therefore falls mechanically as the bid rises, since $\kappa_F(p)/p = \rho r/p$. This is the cheap-option feature of the rule: the valuation signal grows with the auction premium $p - r$, while the default cost remains fixed.

In the default region, the continuation condition becomes $B'(p - r) \geq h(p)\rho r$. In the linear benchmark $B(p - r) = b(p - r)$, this becomes $b \geq h(p)\rho r$.

Claim 2 (Overbidding under fixed deposits)**.** *Suppose the fixed reserve-pegged deposit rule $\kappa_F(p) = \rho r$ is in place. If there is an interval of prices above v_M, contained in the default region, on which $B'(p - r) \geq h(p)\rho r$, then M has a privately profitable continuation strategy throughout that interval. Thus, bidding above intrinsic land value can arise along the equilibrium path.*

The result is conditional, not universal. It does not imply that every high bid reflects speculative intent. It shows that fixed deposits can make overbidding privately rational when three conditions coincide: external asset exposure is large, the auction premium is salient for valuation, and the penalty for default does not rise with the bid. In this setting, the bidder is not merely choosing whether to buy land; it is also choosing how much public valuation pressure to create before settlement is verified.

4.3. Dynamic bid-pegged deposits

A dynamic bid-pegged deposit rule replaces the fixed reserve-based cost with a live-bid-based cost. Under this rule, $\kappa_D(p) = \alpha p$, where $\alpha \in (0,1)$ is the dynamic deposit ratio. Operationally, each active bidder must maintain bid security equal to αp_t at every standing bid p_t. If the bidder has already posted d_{t-1}, the required top-up is $\max\{0, \alpha p_t - d_{t-1}\}$. Failure to top up implies withdrawal. If the bidder wins and defaults, the total forfeited amount is αp_T, where p_T is the terminal winning bid.

In the default region, the continuation condition becomes $B'(p - r) \geq \alpha p h(p)$. In the linear benchmark, this is $b \geq \alpha p h(p)$. Unlike the fixed-deposit rule, the expected cost of default now rises with the bid.

Claim 3 (Finite stopping under dynamic deposits)**.** *Under the dynamic bid-pegged deposit rule, define $m_D(p) = B'(p - r) - h(p)L(p; \kappa_D)$. If $m_D(p)$ is continuous and crosses zero once from positive to negative, then the unique optimal stopping threshold p^* satisfies $m_D(p^*) = 0$. In the linear benchmark and default region, this condition is $b = \alpha p^* h(p^*)$.*

The intuition is simple. A fixed deposit allows the signal to grow while the default cost remains capped. A dynamic deposit makes the cost of default scale with the signal. This reduces the private return to strategic overbidding without requiring the state to know

the parcel's fundamental value. The rule is therefore especially attractive in settings where administrative valuation capacity is limited but auction prices are highly salient.

This does not mean that a linear dynamic deposit eliminates all speculative bidding. If external exposure is very large, if the signal sensitivity B' is high, or if the hazard rate $h(p)$ is low over the relevant price range, a higher deposit ratio or a convex schedule may be required. The policy point is comparative: bid-pegged deposits discipline the price signal more effectively than reserve-pegged deposits because the default cost rises with the bid.

4.4. Competition shield and strategic exit

The model also clarifies why competition may not fully discipline speculative bidding. Let $v_{(1)} \leq \cdots \leq v_{(N)}$ denote the ordered valuations of the genuine developers. While at least two genuine developers remain active, M cannot accidentally win in the next price increment. The risky final-duel stage begins only once the price reaches the second-highest genuine valuation, $v_{(N-1)}$.

Claim 4 (Competition shield)**.** *For independent private valuations drawn from a common distribution, the second-highest genuine valuation is weakly increasing in N in the sense of first-order stochastic dominance. Therefore, adding genuine developers raises the expected price at which M first faces the risk of accidental winning.*

This result is not an argument against competition. It shows that competition alone may not discipline a bidder who values the price signal itself. A thicker market can sustain the auction long enough to raise the benchmark before the external-value bidder faces meaningful downside risk. In this sense, genuine competition can unintentionally provide a liquidity shield for speculative continuation.

The same environment can also change the behavior of genuine developers. Suppose developer i has intrinsic value v_i and assigns value $W_i \geq 0$ to waiting for a future opportunity, such as a re-auction after default. The developer remains active only while $v_i - p \geq W_i$, so its exit threshold is $v_i - W_i$.

Claim 5 (Strategic exit)**.** *If a genuine developer has a strictly positive waiting value $W_i > 0$, then its optimal exit threshold is below its intrinsic valuation. That is, the developer may rationally exit before the price reaches v_i.*

This strategic-exit channel can weaken price discovery. Once credible developers believe that the current price is being driven by an external valuation motive, they may prefer to wait rather than compete against a benchmark that is detached from development fundamentals. The auction then no longer reveals only the value of the parcel; it also reflects beliefs about future default, re-auction, and financial spillovers.

A related fiscal issue arises when default penalties scale with the bid. If the state receives αp after default but at most a fundamental sale value from allocation to a genuine developer,

then very high bids can create a short-run revenue temptation. This is not a reason to reject dynamic deposits. Rather, it shows why deposit reform should be paired with settlement discipline and a clear administrative objective: the purpose of the auction is land allocation and project delivery, not forfeiture revenue.

4.5. Model limitations

The model is stylized with four limitations. First, the external valuation gain $B(p - r)$ is reduced form. In practice, it depends on land-bank composition, collateral rules, investor beliefs, media diffusion, and regulatory credibility. Second, the baseline model focuses on deposit forfeiture as the main cost of default, while actual default costs may include legal sanctions, reputational losses, exclusion from future auctions, financing constraints, or criminal liability. Third, the dynamic deposit result depends on the behavior of $B'(p-r)-h(p)L(p;\kappa_D)$. If external exposure is extremely large or the valuation distribution is very heavy-tailed, a higher deposit ratio, a convex schedule, or complementary liability rules may be required. Finally, the model identifies conditions under which speculative bidding can be privately rational; it does not estimate how frequently such behavior occurs across all land auctions.

5. Calibration and simulation

The model identifies conditions under which fixed deposits can make overbidding privately attractive. This section evaluates the magnitude of that incentive through calibrated Monte Carlo simulations. The exercise is not a structural estimate of bidder intent. It is a transparent numerical experiment disciplined by the observed auction rules, the Plot 3-12 valuation shock, and the institutional difference between fixed reserve-pegged deposits and dynamic bid-pegged deposits.

5.1. Parameter calibration

We calibrate the baseline simulation to Plot 3-12, the largest valuation shock in the Thủ Thiêm sequence. The reserve price was r = 2,942 billion VND, the observed winning bid was 24,500 billion VND, and the statutory deposit was fixed at 20 percent of the reserve price. The historical default cost was therefore $\rho r = 588.4$ billion VND. Genuine developer valuations are drawn from a log-normal distribution with $N = 10$ genuine developers, $\mu = 9.0$, and $\sigma = 0.65$. This implies a median valuation of roughly 8.1 trillion VND and a right tail capable of generating high-stakes urban land valuations in the range observed in Thủ Thiêm. The purpose of this distributional assumption is not to estimate true private values, which are unobserved, but to generate a plausible genuine-demand environment against which fixed and dynamic deposit rules can be compared.

A crucial distinction is that the observed winning bid need not equal the external-value bidder's stopping threshold. In an ascending auction, if the external-value bidder wins, the terminal price is determined by the point at which the final genuine developer exits.

The external-value bidder's own stopping threshold can therefore lie above the observed winning bid. We set the fixed-rule threshold at $p_F = 35{,}000$ billion VND, a finite continuation threshold above the observed 24,500 billion VND terminal bid. This replaces earlier unbounded-bidding language with a transparent finite benchmark.

The external valuation gain is based on the auction premium, not the absolute bid. In the linear benchmark, the external-value bidder obtains $B(p - r) = b(p - r)$, where b is the marginal external gain from raising the public price signal by one VND billion. We infer b from the fixed-rule stopping condition $b = h(p_F)\rho r$, using the log-normal hazard rate at $p_F = 35{,}000$. This gives $b = 0.067174$. In words, each additional VND billion of auction premium generates an expected external valuation gain of about 0.067 billion VND for the external-value bidder under the calibrated payoff structure.

The counterfactual dynamic rule applies the same 20 percent headline deposit ratio to the live bid rather than the reserve price. Under this rule, the stopping condition is $b = \alpha p h(p)$, with $\alpha = 0.20$. Solving this condition gives a dynamic-rule stopping threshold of 3,706 billion VND. Thus, the same external valuation gain that supports continued bidding under the fixed rule is no longer sufficient once the default cost scales with the bid.

Table 3: Baseline calibration parameters

Parameter	Value	Interpretation
Reserve price r	2,942	Plot 3-12 reserve price, VND billion
Observed winning bid	24,500	Plot 3-12 terminal auction price, VND billion
Fixed deposit ρr	588.4	20 percent of reserve price, VND billion
Number of genuine developers N	10	Baseline number of genuine bidders
Log-normal parameter μ	9.0	Location parameter for genuine valuations
Log-normal parameter σ	0.65	Dispersion parameter for genuine valuations
Fixed-rule threshold p_F	35,000	External-value bidder stopping threshold, VND billion
Marginal external gain b	0.067174	External gain per VND billion of auction premium
Dynamic deposit ratio α	0.20	Deposit share of live bid
Dynamic-rule threshold p_D	3,706	Implied stopping threshold under dynamic deposits, VND billion

Notes: The fixed-rule threshold is not the observed winning bid. It is the external-value bidder's calibrated stopping point, which can exceed the observed terminal price because the terminal price is determined by the final genuine developer's exit. The marginal external gain b is inferred from the fixed-rule stopping condition and then held fixed when evaluating the dynamic deposit rule.

5.2. Simulation algorithm

Each simulation contains ten genuine developers and one external-value bidder. Genuine valuations are drawn independently from the log-normal distribution. The external-value bidder follows a stopping rule: it remains active until the auction reaches its rule-specific threshold, $p_F = 35{,}000$ under the fixed rule and $p_D = 3{,}706$ under the dynamic rule.

The auction outcome depends on the relationship between the external-value threshold and the two highest genuine valuations. If the threshold is below the second-highest genuine valuation, the external-value bidder exits early and the genuine developers determine the allocation. If the threshold lies between the second-highest and highest genuine valuations,

the highest genuine developer wins. If the threshold exceeds the highest genuine valuation, the external-value bidder wins and defaults. We run 1,000 Monte Carlo auctions under each rule and report default rates, genuine win rates, terminal prices, premia over reserve, and price distortion relative to the genuine second-highest valuation.

5.3. Baseline results

Table 4 reports the baseline simulation results. Under the fixed reserve-pegged deposit, the external-value bidder wins and defaults in 87.8 percent of simulated auctions. The mean terminal price is 22,631 billion VND, close to the observed Plot 3-12 bid of 24,500 billion VND. The mean premium over reserve reaches 669.2 percent, and the terminal price is, on average, 43.1 percent above the genuine second-highest valuation. This captures the cheap-option property of the fixed rule: the bidder can generate a large public signal while the downside remains capped at 588.4 billion VND.

Under the dynamic bid-pegged deposit, the stopping threshold falls to 3,706 billion VND. The external-value bidder no longer wins in the baseline simulation, so the genuine win rate rises to 100 percent. Mean terminal prices remain high, reflecting the calibrated high-stakes demand environment, but the price distortion relative to the genuine second-highest valuation falls to zero. The dynamic rule therefore does not mechanically depress all land prices. Rather, it removes the artificial wedge created by the external-value bidder and returns the auction outcome to genuine bidder competition.

Table 4: Monte Carlo simulation of fixed and dynamic deposit rules

Deposit rule	Threshold (VND bn)	Default rate (%)	Genuine win rate (%)	Mean price (VND bn)	Median price (VND bn)	95th pct. price (VND bn)	Mean premium (%)	Price distortion (%)
Fixed reserve-pegged deposit	35,000	87.8	12.2	22,630.7	21,446.8	35,000.0	669.2	43.1
Dynamic bid-pegged deposit	3,705.8	0.0	100.0	16,245.9	15,462.6	25,792.3	452.2	0.0

Notes: The simulation uses 1,000 auctions with ten genuine developers and one external-value bidder. Genuine developer values are drawn from a log-normal distribution with $\mu = 9.0$ and $\sigma = 0.65$. The fixed rule uses a deposit equal to 20 percent of the reserve price. The dynamic rule uses a deposit equal to 20 percent of the live bid. Price distortion is measured relative to the genuine second-highest valuation.

Figures 7 and 8 visualize the same comparison. Under the fixed rule, most simulated auctions end with the external-value bidder winning and defaulting. Under the dynamic rule, the stopping threshold is low enough that the external-value bidder exits early, and genuine developers determine the terminal price. The figures therefore illustrate the policy mechanism behind the model: dynamic deposits work by reducing the private value of staying in the auction solely to extend the price signal.

5.4. Sensitivity analysis

The baseline comparison relies on transparent parameter choices, so we examine whether the results are driven by a narrow calibration. Table 5 reports one-at-a-time sensitivity checks around the baseline simulation. We vary the number of genuine developers N, the

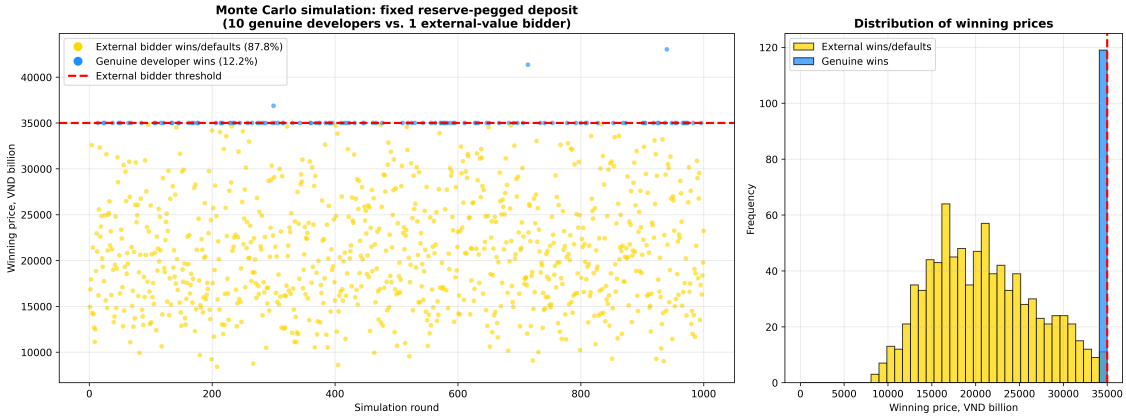

Figure 7: **Monte Carlo simulation under fixed reserve-pegged deposits.** Gold dots indicate simulations in which the external-value bidder wins and defaults; blue dots indicate simulations in which a genuine developer wins. The red dashed line marks the calibrated fixed-rule stopping threshold of 35,000 billion VND.

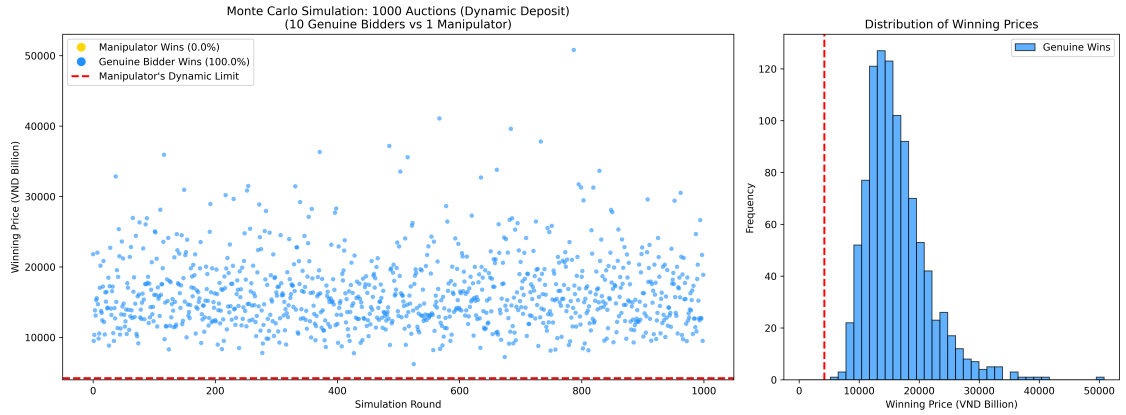

Figure 8: **Monte Carlo simulation under dynamic bid-pegged deposits.** The dynamic rule lowers the external-value bidder's stopping threshold to approximately 3,706 billion VND. In the baseline simulation, this eliminates external-value wins and leaves allocation to genuine developers.

dispersion of genuine valuations σ, the dynamic deposit ratio α, and the marginal external gain b. For each scenario, the fixed rule keeps the calibrated fixed-rule threshold $p_F = 35{,}000$ billion VND, while the dynamic-rule threshold is recomputed from the stopping condition $b = \alpha p h(p)$ and b scale is the fraction of benchmark $b = 0.067174$.

The results show two robust patterns. First, fixed reserve-pegged deposits remain vulnerable across the parameter space. The simulated default rate under the fixed rule remains high in every scenario, ranging from 70.86% under higher valuation dispersion to 98.35% under lower valuation dispersion. The rate falls when there are more genuine developers because a thicker market makes it more likely that at least one genuine developer has a valuation above the fixed stopping threshold. Yet even with $N = 20$, the external-value bidder still wins and defaults in 77.76% of simulations. This confirms the core cheap-option logic: the default cost remains tied to the reserve price while the public signal rises with the live bid.

Table 5: Sensitivity analysis of simulated default incentives

Scenario	N	σ	α	b scale	Dynamic threshold (VND bn)	Fixed default (%)	Dynamic default (%)	Dynamic distortion (%)
Baseline	10	0.65	0.20	1.00	3,705.8	88.04	0.00	0.00
Fewer genuine developers	5	0.65	0.20	1.00	3,705.8	93.98	0.01	0.00
More genuine developers	20	0.65	0.20	1.00	3,705.8	77.76	0.00	0.00
Lower valuation dispersion	10	0.50	0.20	1.00	4,063.6	98.35	0.00	0.00
Higher valuation dispersion	10	0.80	0.20	1.00	3,492.2	70.86	0.00	0.00
Lower dynamic deposit ratio	10	0.65	0.10	1.00	5,321.4	88.51	0.00	0.00
Higher dynamic deposit ratio	10	0.65	0.30	1.00	3,115.0	88.74	0.00	0.00
Lower external gain	10	0.65	0.20	0.75	3,268.8	88.18	0.00	0.00
Higher external gain	10	0.65	0.20	1.25	4,120.7	88.49	0.00	0.00
Very high external gain	10	0.65	0.20	2.00	5,321.4	88.26	0.00	0.00
Stress test: low deposit, high gain	10	0.65	0.05	2.00	18,516.0	88.49	33.98	18.51
Stress test: very low deposit, high gain	10	0.65	0.02	2.00	120,068.4	88.84	99.98	49.19

Notes: Each row reports 20,000 Monte Carlo simulations. The fixed rule keeps the calibrated fixed-rule threshold $p_F = 35{,}000$ billion VND. The dynamic threshold is recomputed under each scenario from the stopping condition $b = \alpha p h(p)$. The baseline uses $N = 10$, $\sigma = 0.65$, $\alpha = 0.20$, and b scale $= 1$. Fixed default is the external-value bidder's win and default rate under the historical reserve-pegged deposit rule. Dynamic default is the corresponding rate under the bid-pegged deposit rule. Dynamic distortion is the mean price distortion relative to the genuine second-highest valuation under the dynamic rule.

Second, dynamic bid-pegged deposits substantially reduce default incentives across all standard perturbations. Under the baseline, the dynamic threshold is 3.71 trillion VND and the simulated default rate is zero. The result is stable when we vary the number of genuine developers, valuation dispersion, the dynamic deposit ratio between 10% and 30%, and the marginal external gain up to twice the baseline. In these cases, the dynamic threshold remains low enough for genuine developers to determine the auction outcome, and price distortion relative to the genuine second-highest valuation is essentially eliminated.

The stress tests clarify the limits of the policy. If the dynamic deposit ratio is reduced to 5% while the external gain doubles, the dynamic threshold rises to 18.52 trillion VND, the default rate increases to 33.98%, and price distortion reaches 18.51%. If the deposit ratio falls to 2% under the same high-gain environment, the dynamic rule effectively loses discipline: the threshold rises above 120 trillion VND, the simulated default rate reaches 99.98%, and price distortion reaches 49.19%. The interpretation is therefore comparative rather than absolute. Dynamic deposits do not guarantee efficient allocation in every possible environment. They work by forcing the bidder to internalize more of the cost of the price signal, and they sharply reduce default incentives under the calibrated Thủ Thiêm conditions. In more extreme environments, dynamic deposits should be complemented by signal quarantine, shorter settlement windows, and stronger counterparty guarantees.

5.5. Interpretation

The simulations clarify why the deposit base matters. Under the historical rule, the bidder risks only 20 percent of the reserve price while generating a signal based on the live bid. In the Plot 3-12 calibration, this fixed cost was 588.4 billion VND against a terminal

bid of 24.5 trillion VND. The implied signal leverage was therefore large enough to keep the external-value bidder active well beyond the observed terminal price.

Under the dynamic rule, the same 20 percent headline ratio produces a very different incentive. Because the deposit rises with the bid, the stopping threshold falls from 35 trillion VND to roughly 3.7 trillion VND. The policy implication is direct: when auction prices can affect external valuation, collateral capacity, or investor expectations, deposit rules must price the signal created by the bid, not merely the land offered at the reserve price.

6. Urban management and policy implications

The empirical evidence and model do not establish legal intent in any particular auction. They instead identify an institutional channel through which fixed deposits, delayed settlement, and limited liability can make speculative price signaling privately attractive. The policy problem is therefore not only the loss of auction revenue after default. It is that an unsettled auction price can circulate as a public benchmark before payment is verified, affecting collateral valuation, investor expectations, compensation claims, and land assembly.

6.1. Urban management consequences of unsettled price signals

The urban management cost of unsettled price signals can be substantial. When auction prices are treated as credible benchmarks before settlement, local residents, developers, appraisers, and public agencies may update expectations even if the winning bidder later defaults. This creates a time cost for the urban economy: land remains idle, compensation negotiations become harder, and infrastructure delivery is delayed.

This friction is illustrated by the stalling of key infrastructure projects in Ho Chi Minh City. Following the 2021 Thủ Thiêm auction shock, residents in the neighboring 30-hectare Nam Rạch Chiếc resettlement area cited the record-breaking 2.4 billion VND/m^2 price as a new baseline, refusing previously agreed compensation rates. This reported recalibration of expectations complicated site clearance and delayed critical arterial roads (The Investor, 2025). Similarly, Metro Line No. 2 has been affected by widening gaps between state compensation frames and market prices inferred from high-profile land transactions (The Investor, 2026). These examples show how an auction price can become an urban governance problem even after the auction itself has failed.

The reforms below therefore target three variables highlighted by the model. Dynamic deposits raise the cost of default, $\kappa(p)$. Shorter settlement windows reduce the duration over which an unsettled price can operate as a signal. Prudential firewalls reduce the sensitivity of external assets to unsettled auction prices. Together, these reforms aim to align auction incentives with credible development rather than temporary benchmark creation.

6.2. Dynamic deposits: pricing the signal option

The most pressing failure suggested by our model is the mismatch between a fixed penalty and a scalable price signal. Under the status quo codified in the *Law on Property Auction*

No. 01/2016/QH14 (National Assembly of Vietnam, 2016), the bid deposit is tied to the reserve price:

> **Article 39. Advance payment and handling thereof**
>
> 1. A bidder shall make an advance payment...**between five percent and twenty percent of the reserve price** of the auctioned property...

By capping the deposit $\bar{\kappa}$ at 20% of the reserve price, the law makes the cost of default insensitive to the live auction price. As the bid rises, the effective deposit ratio falls mechanically. The bidder therefore creates a larger public signal while risking the same reserve-pegged deposit. In the language of the model, the benefit $B(p - r)$ rises with the auction premium, while $\kappa(p)$ remains fixed.

To correct this incentive distortion, the deposit must rise with the placed bid. We propose replacing the static cap with a dynamic activity rule:

1. **The rolling peg mechanism:** As bidding progresses, the deposit requirement updates in real time. If the standing bid exceeds 150% of the reserve price, the bidder must top up its bid security to maintain a 20% ratio against the *current* standing bid. If the bidder fails to provide the top-up before the next bidding round, it is automatically withdrawn. If the bidder wins and defaults, the total forfeited amount is the full bid-pegged security, not merely the incremental top-up.
2. **The calibration constraint:** In principle, the deposit ratio should be high enough that the expected cost of default exceeds the external valuation gain from additional bidding. Since regulators cannot directly observe each bidder's external exposure, the rule should be implemented as a transparent schedule rather than a discretionary case-by-case calculation. A practical approach is to maintain the ordinary deposit below a moderate premium threshold, then require live-bid top-ups once bids exceed a specified multiple of the reserve price.
3. **Bank guarantees rather than cash-only collateral:** To avoid excluding genuine developers with liquidity constraints, the dynamic deposit need not be entirely cash-collateralized. It can be satisfied through irrevocable bank guarantees that scale with the bid. This shifts part of the screening function to banks, which have incentives to evaluate whether a bidder can credibly settle if it wins.

6.3. Settlement windows and signal quarantine

An option is valuable partly because it has duration. The pump-then-default incentive is stronger when the winning bidder can use the auction result as a public benchmark before paying the full price. Currently, *Decree No. 102/2024/ND-CP* (Government of Vietnam, 2024) defers to *Decree No. 126/2020/ND-CP* (Government of Vietnam, 2020a), which provides a staged payment schedule:

Article 18 (Decree 126). Tax payment time limits...

4 b/ Within 90 days from the date of issuance of a notice... the land user shall pay the remaining 50% of the payable land use levy amount as notified.

This statutory timeline can create a period in which the winning bid is public, salient, and potentially usable as a valuation reference, even though the principal has not yet been paid. To reduce this signal duration, settlement rules should distinguish between provisional auction results and verified transaction prices.

We propose two linked reforms:

1. **Immediate partial settlement:** The winning bidder should settle a substantial portion of the winning bid, for example 10 to 20%, within seven days of the hammer fall. This requirement makes the initial price signal costly and screens out bidders that cannot mobilize credible financing quickly.
2. **Signal quarantine:** Until the initial settlement is paid, the auction result should be legally classified as *provisional*. A provisional price should be excluded from official land appraisal, compensation benchmarks, bank collateral valuation, and bond-issuance documentation. Once payment is verified and the Land Use Right certificate is issued, the price can enter official benchmark systems.

Signal quarantine preserves the informational value of completed auctions while preventing unsettled bids from distorting valuation systems. It also reduces the duration of the price-signal option without requiring the state to determine the parcel's true value.

6.4. Prudential firewalls

The bidder's incentive is driven by the sensitivity of external assets to the auction price. At the time of the auction, *Decree No. 153/2020/ND-CP* (Government of Vietnam, 2020c) prioritized issuer autonomy in corporate bond markets:

Article 5. Principles of bond issuance and use

1. Corporations shall issue bonds on the principles of self-borrowing, self-repayment... and ensuring their solvency.

Under this framework, developers could issue bonds based partly on the book value of their land banks. A record-breaking auction result could become a convenient comparable transaction for updating investor expectations or collateral narratives, even before the auction price was settled. The relevant policy objective is therefore to block the transmission of unsettled auction prices into financial valuation channels.

We propose a prudential firewall between auction outcomes and collateral systems:

1. **Exclusion of unsettled bids:** The Ministry of Finance and relevant valuation authorities should prohibit the use of unsettled auction prices as comparable transactions until full payment is verified and the Land Use Right certificate is issued.
2. **Outlier review:** Auction results that exceed historical local benchmarks by a large margin, for example more than three standard deviations, should be subject to a probationary review period before entering official land-price databases, compensation schedules, or collateral valuation models.
3. **Disclosure requirements:** Bond issuers and lenders should disclose if any land valuation relies on unsettled or provisional auction results. This creates an audit trail and reduces the ability to transform temporary auction prices into balance-sheet capacity.

This firewall is particularly important under the 2024 Land Law's move toward compensation based on specific market prices rather than static state frames (National Assembly of Vietnam, 2024). Without outlier quarantine, a single unsettled auction can distort the compensation baseline for nearby public works. When residents and landowners anchor expectations to an unsettled speculative price, the gap between feasible compensation and demanded compensation widens, delaying site clearance and weakening planning credibility.

6.5. Strengthening the counterparty

Finally, the policy design must address the solvency blind spot. Current regulations focus on project feasibility and investment capital rather than the liquidity and settlement capacity of the bidding entity. This allows large corporate groups to bid through undercapitalized Special Purpose Vehicles (SPVs) with limited liability. *Decree No. 43/2014/ND-CP* (Government of Vietnam, 2014) requires equity based on self-declared investment capital:

> **Article 14. Detailed provisions on... leased land...**
>
> 2 a/ Having own capital... equal to at least 20% of the total investment...

When the SPV defaults, the *Civil Code* No. 91/2015/QH13 (National Assembly of Vietnam, 2015) and the *Law on Enterprises* No. 06/2020/L-CTN (National Assembly of Vietnam, 2020) limit the parent company's exposure to the capital committed to the subsidiary:

> **Article 74 (Law on Enterprises).** *Single member limited liability company*
>
> 1. ...The company owner is liable for all debts... within the charter capital of the company.

This structure can separate external gains from default losses: the wider corporate group may benefit from the price signal, while the SPV absorbs the deposit forfeiture. To align incentives, high-value public land auctions should require stronger counterparty commitments.

1. **Parent guarantees for strategic parcels:** For nationally or municipally strategic land assets, parent companies should sign a corporate guarantee. Default by the bidding subsidiary would then trigger liability at the group level, increasing $\kappa(p)$ and reducing the attractiveness of speculative bidding through thinly capitalized vehicles.
2. **Pre-approved financing certification:** Before participating in high-value auctions, bidders should provide evidence of financing capacity, including bank commitments or guarantees that scale with bid levels. This screen targets settlement credibility rather than simply headline project ambition.
3. **Targeted rather than universal application:** To avoid discouraging smaller genuine developers, parent guarantees and enhanced financing certification should apply only above specified thresholds, such as parcel size, reserve price, urban strategic importance, or bid premium over reserve.

6.6. Feasibility, costs, and unintended consequences

The proposed reforms are not costless. Dynamic deposits can increase liquidity burdens, signal quarantine can delay the incorporation of useful price information, and parent guarantees can deter participation by smaller developers. The aim is therefore not to maximize collateral for its own sake, but to ensure that any bidder capable of creating a large public price signal also internalizes a proportional share of the downside risk.

Table 6: Feasibility and trade-offs of proposed reforms

Reform	Model channel	Implementation route	Main risk	Mitigation
Dynamic bid-pegged deposit	Raises $\kappa(p)$ with the live bid	Amendment to auction rules or implementing decree	Liquidity burden on genuine developers	Allow irrevocable bank guarantees and trigger top-ups only above a premium threshold
Short settlement window	Reduces signal duration	Administrative settlement rule or decree amendment	Excludes bidders with slow financing	Require pre-auction financing certification and phased settlement
Signal quarantine	Reduces use of unsettled prices as benchmarks	Valuation standards and appraisal guidance	Temporarily withholds potentially useful information	Classify results as provisional until payment verification
Prudential firewall	Reduces transmission to collateral and bond markets	Coordination among finance, banking, securities, and land authorities	Enforcement and data-sharing burden	Mandatory disclosure of valuation inputs and audit trails
Parent guarantee	Raises group-level default cost	Auction eligibility requirement for strategic parcels	May deter smaller bidders	Apply only to high-value or strategically important parcels

As Table 6 shows, the implementation route differs across reforms. Some measures can be introduced administratively, while others require legal amendment. Signal quarantine and disclosure rules can begin through valuation guidance and appraisal standards. Shorter settlement windows and bank-guarantee requirements may require decree-level changes. Altering the statutory deposit cap in the *Law on Property Auction*, imposing parent-company guarantees, or creating cross-default consequences would likely require statutory amendment or auction-specific eligibility rules for strategic land assets.

The sequencing of reforms matters. In the short run, authorities can classify unsettled auction prices as provisional and exclude them from appraisal and collateral systems. In

the medium run, auction rules can introduce bid-pegged deposits through bank guarantees. In the longer run, statutory reforms can align limited liability, corporate guarantees, and land-auction eligibility with the urban-management objective of credible project delivery.

7. Conclusion

The 2021 Thủ Thiêm auction served as a stress test for emerging market institutions. Beyond the headline US$106,000/m^2 valuation, the event's true significance lies in the subsequent defaults. Rather than interpreting these defaults only as instances of the winner's curse, this paper develops a *speculative bidding hypothesis*. By forfeiting a capped deposit, the bidder effectively purchased a sector-wide asset revaluation. This exposes an incentive design flaw: when static entry fees meet scalable external gains, the legal framework may inadvertently subsidize speculative price signaling. Our theoretical model demonstrates that this vulnerability is not merely anecdotal but institutional. As long as default costs remain fixed while signaling benefits scale with the auction premium, rational agents with large external portfolios may have incentives to bid beyond intrinsic land value. In this context, the winner's curse is not the only relevant interpretation; under certain auction rules, apparent overbidding can also reflect an equilibrium response to external valuation gains.

The empirical evidence supports this interpretation. The four Thủ Thiêm plots all generated extreme bid premia and ended in default or non-payment. The complementary Hanoi cases show that similar benchmark effects also appeared in smaller residential land-use-right auctions, where many awarded lots remained unpaid. Equity-market responses further indicate that the Thủ Thiêm signal was capitalized unevenly across listed real estate firms, with the strongest reactions among firms perceived to have greater spatial or collateral exposure to the new benchmark. Taken together, the auction outcomes, settlement failures, valuation anomalies, and market reactions point to a speculative-signaling channel that conventional winner's curse accounts alone do not fully explain.

Reforms are urgent, especially as Ho Chi Minh City prepares to re-auction the same set of four plots in 2026 (The Saigon Times, 2025). Without dynamic deposits, settlement discipline, and prudential firewalls, the city risks repeating cycles of artificial inflation and market paralysis. As developing cities increasingly rely on land value capture to finance urbanization, Thủ Thiêm serves as a stark warning. The transition from *land for construction* to *land for financialization* demands robust regulatory design, because unsettled auction benchmarks can raise compensation expectations, delay site clearance, slow land assembly, and weaken project delivery. Public auctions should not become high-risk speculative instruments whose strongest effect is to move collateral values before land is actually developed.

This vulnerability extends beyond Vietnam. Across emerging Asian markets, state land auctions can blur the line between urban development and corporate financialization. In China, "Land King" episodes show how record auction bids can become valuation benchmarks, shape expectations, and interact with leveraged developer balance sheets (Lin, 2014;

Wu, 2015). In Malaysia, the speculative frenzy of Johor's Forest City illustrates how external capital can treat state real estate as a financial asset rather than a functional urban project (Moser, 2018). From corporate land banking in Indonesia's Nusantara to transit-driven speculation in Thailand (Shatkin, 2017), the pattern is clear. Where prime land, opaque valuation systems, and leveraged finance intersect, auctions can transmit financial risk into urban governance. The central lesson is therefore simple: land auction rules must price not only the parcel being sold, but also the market signal the winning bid creates.

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Appendix A. Mathematical proofs

This appendix proves the claims in Section 4. Let $S(p) = 1 - F(p)$ denote the survival function of a genuine developer's valuation, and let $h(p) = f(p)/S(p)$ denote the hazard rate. The external valuation gain is written as $B(p - r)$, where r is the reserve price and $p - r$ is the auction premium. The proofs focus on the final-duel stage, where the external-value bidder M faces one remaining genuine developer. Before this stage, M cannot accidentally win because at least two genuine developers remain active.

Appendix A.1. Proof of Claim 1

Proof. Consider the final-duel stage at price p_0, where bidder M faces one remaining genuine developer with valuation V. Conditional on reaching p_0, the remaining developer's valuation satisfies $V \geq p_0$. Suppose M chooses a stopping threshold $t \geq p_0$. If the genuine developer remains active until t, M exits and loses, receiving $B(t-r)$. If the genuine developer exits at some price $s \in [p_0, t]$, M wins at s. Its payoff from winning is $B(s-r)+\max\{v_M - s, -\kappa(s)\}$.

Define the loss from accidentally winning, relative to losing at the same price, as

$$L(s;\kappa) \equiv -\max\{v_M - s, -\kappa(s)\} = \min\{s - v_M, \kappa(s)\}.$$

Thus, if M wins at price s, its payoff can be written as $B(s - r) - L(s;\kappa)$.

Conditional on $V \geq p_0$, the probability that the genuine developer remains active until t is $S(t)/S(p_0)$, while the density of exit at s is $f(s)/S(p_0)$. Therefore, the expected payoff from choosing stopping threshold t is

$$U(t;p_0) = \frac{S(t)}{S(p_0)} B(t-r) + \int_{p_0}^{t} \frac{f(s)}{S(p_0)} \left[B(s-r) - L(s;\kappa)\right] ds.$$

Differentiating $U(t;p_0)$ with respect to t gives

$$\frac{\partial U(t;p_0)}{\partial t} = \frac{S(t)}{S(p_0)} \left[B'(t-r) - h(t)L(t;\kappa)\right].$$

Since $S(t)/S(p_0) > 0$, the sign of the marginal value of increasing the stopping threshold is the sign of $B'(t-r) - h(t)L(t;\kappa)$. Hence raising the stopping threshold is locally profitable if and only if $B'(t-r) \geq h(t)L(t;\kappa)$. In the default region, $t - v_M \geq \kappa(t)$, so $L(t;\kappa) = \kappa(t)$. The continuation condition then reduces to $B'(t-r) \geq h(t)\kappa(t)$. □

Appendix A.2. Proof of Claim 2

Proof. Under a fixed reserve-pegged deposit rule, the default cost is $\kappa_F(p) = \bar{\kappa} = \rho r$, where $\rho \in (0,1)$ is the statutory deposit ratio. In the default region, $p - v_M \geq \rho r$, so the loss from accidentally winning is $L(p;\kappa_F) = \rho r$.

By Claim 1, the marginal value of increasing the stopping threshold at price p is nonnegative whenever

$$B'(p-r) \geq h(p)\rho r.$$

Suppose this inequality holds throughout an interval I of prices above v_M, and suppose I lies in the default region. Then the expected payoff from increasing the stopping threshold is weakly increasing throughout I. Hence M has a privately profitable continuation strategy throughout that interval. Because I contains prices above v_M, bidding above intrinsic land value can arise along the equilibrium path.

In the linear benchmark $B(p-r) = b(p-r)$, where $b = A\theta$, the condition becomes $A\theta \geq h(p)\rho r$. Thus, fixed deposits can make overbidding privately rational when the marginal external valuation gain exceeds the hazard-weighted fixed default cost. □

Appendix A.3. Proof of Claim 3

Proof. Under a dynamic bid-pegged deposit rule, the default cost is $\kappa_D(p) = \alpha p$, where $\alpha \in (0,1)$. Define

$$m_D(p) = B'(p-r) - h(p)L(p;\kappa_D).$$

By Claim 1, the derivative of M's expected payoff with respect to the stopping threshold has the same sign as $m_D(p)$.

Assume that $m_D(p)$ is continuous and crosses zero once from positive to negative at p^*. Then the expected payoff is increasing for thresholds below p^* and decreasing for thresholds above p^*. Therefore, p^* is the unique optimal stopping threshold.

In the default region, $L(p;\kappa_D) = \alpha p$, so the stopping condition $m_D(p^*) = 0$ becomes

$$B'(p^* - r) = \alpha p^* h(p^*).$$

In the linear benchmark $B(p-r) = A\theta(p-r)$, this simplifies to

$$A\theta = \alpha p^* h(p^*).$$

Thus, when the expected penalty term $\alpha p h(p)$ eventually exceeds the marginal external gain $A\theta$, the dynamic deposit rule generates a finite stopping threshold. □

Appendix A.4. Proof of Claim 4

Proof. Let a genuine developer have intrinsic valuation v_D. If the developer wins the current auction at price p, its surplus is $v_D - p$. Let $W_D \geq 0$ denote the value of waiting for a future opportunity, such as a re-auction after default or a later acquisition at a lower expected price. The developer remains active only if winning now weakly dominates waiting:

$$v_D - p \geq W_D.$$

Solving for the exit threshold gives

$$\hat{p} = v_D - W_D.$$

If $W_D > 0$, then $\hat{p} < v_D$. Therefore, a genuine developer with a positive waiting value may rationally exit before the auction price reaches its intrinsic valuation.

The earlier discounted re-auction formulation is a special case. If $W_D = \delta(v_D - p_{future})$, where $\delta \in (0, 1)$ and $p_{future} < v_D$, then the exit price solves

$$v_D - \hat{p} = \delta(v_D - p_{future}),$$

so

$$\hat{p} = (1 - \delta)v_D + \delta p_{future} < v_D.$$

Thus, anticipated default and re-auction can induce early exit by genuine developers. □

Appendix A.5. Proof of Claim 5

Proof. Let $v^N_{(1)} \leq \cdots \leq v^N_{(N)}$ denote the order statistics of N independent genuine developer valuations. The external-value bidder M cannot accidentally win while at least two genuine developers remain active. Therefore, the risky final-duel stage begins only when the price reaches the second-highest genuine valuation, $v^N_{(N-1)}$.

Now add one additional independent genuine developer. Let $v^{N+1}_{(1)} \leq \cdots \leq v^{N+1}_{(N+1)}$ denote the order statistics of the enlarged sample. Holding the original N draws fixed and adding one more draw cannot reduce the second-highest value in the sample. Hence, under this coupling,

$$v^{N+1}_{(N)} \geq v^N_{(N-1)},$$

where $v^{N+1}_{(N)}$ is the second-highest value among $N + 1$ observations. Therefore, the second-highest genuine valuation is weakly increasing in N in first-order stochastic dominance.

Since the price at which M first faces accidental-winning risk is the second-highest genuine valuation, increasing the number of genuine developers raises the expected price at which this risk begins. This is the competition-shield effect: thicker genuine competition can sustain the auction to a higher price before the external-value bidder faces meaningful downside risk. □