The Fiscal-Property Nexus: How Local Government Finance Shapes Housing Market Resilience During China's Real Estate Downturn

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ABSTRACT

This paper examines the spatial heterogeneity in housing price resilience across 366 Chinese cities during an unprecedented real estate market correction beginning in late 2021. Drawing on fiscal geography perspectives, the study analyzes the fiscal-property resilience nexus to understand how local government fiscal structures shape housing market outcomes. Using panel regression models with fixed effects from 2015-2024, the analysis reveals three significant findings. First, the research identifies a distinctive "barbell effect" in housing price resilience across China's urban hierarchy, with both Tier-1 and Tier-4+ cities demonstrating greater price stability than mid-tier cities. Second, different fiscal instruments operate through distinct phase-dependent mechanisms: general bonds transform from neutral instruments during boom periods to critical counter-cyclical stabilization tools during market corrections, while Local Government Financing Vehicle (LGFV) debt converts from a growth catalyst to a fiscal burden constraining government intervention capacity. Third, land supply transforms from a growth-oriented revenue-generating tool during boom periods to a strategic market stabilization instrument during corrections, with high land-finance dependent cities shifting toward supply restriction to maintain price levels. The granular decomposition of local government fiscal indicators reveals heterogeneous effects of different debt types on housing price resilience across regions and urban hierarchies, advancing theoretical understanding of how state fiscal structures mediate market dynamics during non-equilibrium adjustments. These insights contribute to broader debates on the spatially variegated nature of state-market relations in urban governance through China's distinctive fiscal-property nexus.

Keywords: Fiscal geography; Housing price resilience; Local government debt; Land finance; Housing Financialization; Market correction

1. Introduction

Since late 2021, China's real estate market has entered an unprecedented adjustment phase. Official data from 70 major cities shows second-hand housing prices have declined by an average of 15% nationwide—the most severe and sustained correction since systematic data collection began. This national decline, however, masks a remarkable spatial differentiation in market performance. Rather than following traditional urban hierarchy or regional development gradients, housing price resilience presents a complex, non-linear pattern wherein some economically weaker cities demonstrate remarkable stability while certain developed regions experience dramatic corrections.

This spatial heterogeneity in housing price resilience demands systematic analysis through the lens of China's unique institutional environment. While conventional housing market theories emphasize demand-side factors such as population mobility, economic growth, and amenity values (Glaeser and Gyourko 2005; Roback 1982), China's distinctive "government-market" relationship generates more complex response mechanisms (Feng, Wu, and Zhang 2023). Local governments deeply participate in real estate market regulation through multiple channels including land transfers, urban renewal, and infrastructure investment, and have actively responded to the central government's policy directive to "implement city-specific measures and stabilize the market" during the recent market downturn. Although all local governments are committed to stabilizing housing prices, their actual intervention capabilities and strategic choices exhibit significant differences.

Drawing on fiscal geography perspectives (Tapp and Kay 2019), I examine the "fiscal-property resilience nexus" across China's diverse urban landscape. This analysis explores how local governments' fiscal structures fundamentally shape their capacity, incentives, and strategic responses to market downturns, generating distinct spatial patterns of housing market outcomes. Within this fiscal-property resilience nexus, I identify three key mechanisms through which fiscal structures influence market stability:

First, land transfer revenue dependency (measured as land revenue to fiscal revenue ratio) may exhibit a dual impact on housing price resilience. High land finance dependency suggests local governments have stronger motivation to support housing prices, but simultaneously reflects structural economic vulnerabilities including limited industrial diversification and weak tax bases. In market downturns, these structural weaknesses might override governments' supportive capacity, potentially accelerating price declines. Second, different types of local government debt may have varying effects across market phases. During boom periods, higher debt levels may enable cities to undertake large-scale infrastructure investments, enhancing urban attractiveness (Ambrose, Deng, and Wu 2015); however, in downward cycles, excessive debt burdens might transform into fiscal pressure, compelling local governments to reduce public services and investments (Li, Wu, and Zhang 2023). The composition of debt potentially matters significantly—explicit debt (general bonds and special-purpose bonds) and implicit debt (through Local Government Financing Vehicles, LGFVs) may affect housing prices through distinct pathways.

Third, I hypothesize that the relationship between fiscal conditions and land supply may transform across different market phases. Land supply, as an important policy tool for local governments, may play different roles throughout the market cycle. During boom periods, local governments might tend to use land supply as a price maintenance tool, strategically controlling supply to support land and housing prices (Pan et al. 2017); while in adjustment periods, land supply might transform into a fiscal pressure transmission channel, with local governments potentially facing a dilemma between fiscal revenue needs and market stabilization.

Using a comprehensive dataset covering 366 Chinese cities from 2015 to 2024 and employing panel regression models with fixed effects, I address three core questions: (1) What are the spatial-temporal

characteristics of China's real estate market correction? (2) How do local government fiscal conditions, debt structures, and land finance dependency affect urban housing price resilience? (3) What role does land supply play in mediating the relationship between local government finances and the real estate market, and has this function transformed between market expansion and contraction phases?

Our empirical analysis yields three significant findings. First, I identify a distinctive "barbell effect" in housing price resilience across China's urban hierarchy, with both Tier 1 and Tier 4+ cities demonstrating greater stability than mid-tier cities. Second, different fiscal instruments operate through phase-dependent mechanisms: general bonds transform from neutral instruments to counter-cyclical stabilization tools during corrections, while LGFV debt converts from a growth catalyst to a fiscal burden constraining intervention capacity. Third, land supply shifts from a revenue-generating tool during booms to a market stabilization instrument during corrections, with high land-finance dependent cities restricting supply to maintain price levels.

These patterns resonate with broader debates on urban financialization and fiscal crisis. Weber (2015) traces how municipal governments increasingly adopt financial logics—issuing debt, speculating on future asset appreciation, and treating urban space as investment portfolios—transforming from service providers into entrepreneurial risk-takers. Chicago's post-2008 collapse, marked by widespread vacancies and depleted public services, illustrates the fragility of debt-fueled urban development when anticipated revenues fail to materialize. China exhibits parallel dynamics of financialized governance, yet institutional differences produce distinct crisis manifestations: whereas US municipalities face hard budget constraints forcing austerity, Chinese local governments roll over debt through state-backed refinancing (Feng, Wu, and Zhang 2025). Land functions as 'pseudo-collateral' embodying government promises rather than liquidatable assets, enabling the state to absorb default risk while accumulating hidden liabilities. This explains why China's adjustment unfolds through price corrections and supply restrictions rather than municipal bankruptcies—the same financialized logic of leveraging future revenues, but cushioned by multi-level state guarantees. Cross-national research should examine how fiscal federalism arrangements mediate the boom-bust cycles inherent to financialized urban development.

This research contributes to existing literature by introducing a granular decomposition of local government fiscal indicators that reveals distinct impact pathways of different debt types on housing markets. Unlike previous studies that largely treat local government debt as homogeneous (Chang, Wang, and Xiong 2025; Pan et al. 2017), I distinguish between general bonds, special-purpose bonds, and LGFV debt, identifying their heterogeneous effects on housing price resilience. Our analysis of land supply as a mediating mechanism further illuminates how local governments strategically deploy land resources to achieve fiscal and market objectives across different market phases, extending understanding of land's role in fiscal-property relations beyond its direct revenue-generating function (He et al. 2022; Wu, Gyourko, and Deng 2015).

This comprehensive investigation provides new theoretical perspectives for understanding China's real estate market spatial differentiation and offers empirical evidence for formulating differentiated policy interventions. By revealing how local fiscal structures shape housing price resilience during market downturns, our findings suggest that addressing housing market instability requires tailored approaches that account for specific local fiscal conditions rather than uniform national policies. In broader terms, this research contributes an analytical framework for understanding non-equilibrium adjustments in global real estate markets in the post-pandemic era, with implications that extend beyond China's specific context to inform debates on the fiscal-property nexus in urban governance. The rest of the paper is structured as follows. Section 2 reviews the literature on fiscal geography and China's fiscal-property nexus. Section 3 presents our research methodology and data sources. Section 4 examines the spatial-temporal charac-

teristics of China's housing market correction. Section 5 analyzes how fiscal structures affect housing price resilience across different market phases, regions, and urban hierarchies. Section 6 examines the functional transformation of land supply as a mediating mechanism. Section 7 concludes with policy implications and directions for future research.

2. Fiscal Geography and Housing Market Resilience in China

2.1 Theoretical Foundations

Housing busts rarely unfold uniformly across space. When booms unwind, some cities experience sharp price corrections while others remain comparatively stable. Conventional demand-side accounts—migration, income growth, amenities—capture part of this heterogeneity but prove insufficient during downturns (Roback 1982; Glaeser and Gyourko 2005). A growing body of work shows that state institutions, particularly local fiscal structures, prove pivotal because they condition governments' capacity and incentives to intervene (Fischel 2001; Ansell 2019).

The lens of fiscal geography treats taxation, expenditure and debt not as neutral backdrops but as instruments actively shaping uneven urban development (Tapp and Kay 2019). Studies of U.S. cities show how financing tools reconfigure spatial outcomes: Chicago's tax-increment financing sustained capital projects while entrenching intra-urban inequality (Weber 2010, 2015). This builds on broader political-economy insights that fiscal stress and adjustment constitute urban governance rather than episodic shocks (O'Connor 1973). During housing downturns, price and turnover declines erode property-tax bases and construction slowdowns depress consumption tax bases (Lutz, Molloy, and Shan 2011). Balanced-budget rules shift adjustment to expenditure cuts, with jurisdictions sorting along pre-existing constraints. These literatures imply that housing market resilience during crises is inseparable from the fiscal architectures through which places adjust.

In contrast, China's institutional environment generates fundamentally different transmission mechanisms. Absent broad-based property taxation, Chinese local governments depend heavily on land-transfer revenues, creating direct fiscal exposure to housing market fluctuations (Ambrose, Deng, and Wu 2015). During downturns, adjustment proceeds through general and special bonds, LGFV refinancing, and administrative control of land supply (Bao, Wang, and Wu 2024). Li, Wu, and Zhang (2023) document how incorporating bonds into budgetary processes since 2015 restructured debt governance, while Feng, Wu, and Zhang (2025) reveal that land functions as "pseudo-collateral" embodying government promises rather than liquidatable assets. This institutional configuration generates a distinct fiscal-property nexus where local governments' debt structures and land finance dependencies may systematically shape housing price resilience during corrections—a relationship requiring empirical investigation.

2.2 The Chinese Context

Since the 1994 tax-sharing reform assigned expanding expenditure responsibilities to local governments without commensurate tax powers, cities have relied on land finance—the conversion of state land-use rights into fiscal resources via auctions and related charges—as their core revenue engine, positioning local governments simultaneously as market regulators and market participants (Ambrose, Deng, and Wu 2015; Wu, Gyourko, and Deng 2015). This institutional configuration creates a direct fiscal–property

nexus: movements in land and housing prices alter local cash flow, debt capacity and incentives to intervene.

Debt instruments and institutional constraints. Two distinct financing circuits operate within this nexus. On-budget borrowing occurs through general bonds (servicing non-revenue public goods) and special-purpose bonds (tied to project cash flows), progressively incorporated into formal budgetary processes with quota management since the mid-2010s (Li, Wu, and Zhang 2023). Parallel to this, a large off-budget circuit persists via Local Government Financing Vehicles (LGFVs), which raise funds against expected land values—a practice that hard-wires real-estate cycles into local balance sheets (Pan et al. 2017; Feng, Wu, and Zhang 2025). Research shows that real estate market prosperity significantly promotes local government debt expansion, with land finance acting as both mediator and moderator of debt-raising behavior (Chen et al. 2023).

Phase-dependent mechanisms. The fiscal–property nexus is state-contingent over the cycle. In expansionary phases, rising land prices and buoyant transactions enlarge land-transfer revenues, relax collateral constraints for LGFVs and improve bond market access, enabling cities to finance infrastructure and amenity upgrades that further capitalize into property values (Ambrose, Deng, and Wu 2015; Pan et al. 2017). In contractionary phases, the mechanism reverses: land auctions thin out, transfer revenues and related fees contract, collateral values weaken and debt-service commitments become more binding, with local governments facing significantly increased repayment risks (Chen et al. 2023).

Land supply as a policy lever. Because urban land is state-owned, administrative control of land release functions as a first-order stabilization tool. During booms, strategic pacing of supply can sustain auction prices and expected fiscal yields; during downturns, supply restraint can be used to defend price levels and collateral values, at the cost of foregone near-term revenue (Ambrose, Deng, and Wu 2015; Chang, Wang, and Xiong 2025). Evidence from the COVID-19 pandemic period shows that cities more dependent on land sales actively maintained market stability through strategic land supply adjustments, with LGFVs purchasing land at higher prices during corrections (Chang, Wang, and Xiong 2025).

Spatial variegation and implications. These mechanisms do not play out uniformly. Cities with higher fiscal self-sufficiency and debt headroom can preserve service quality and targeted interventions longer; heavily LGFV-leveraged jurisdictions face sharper tightening when land markets cool (Pan et al. 2017). The geography of adjustment reflects the local mix of (i) reliance on land-based revenues, (ii) composition of on- versus off-budget debt, and (iii) administrative capacity to modulate land supply. The Chinese case suggests clear, testable propositions: debt composition should matter for price resilience; land-supply choices should mediate fiscal effects; and these relationships should vary across regions and tiers.

2.3 Hypotheses

Drawing on fiscal geography perspectives and China's institutional context, I propose that housing price resilience during market corrections is systematically shaped by local fiscal structures through three interconnected mechanisms: phase-dependent debt effects, spatially differentiated fiscal capacity, and land supply mediation.

Debt composition and phase-dependent effects. Different debt instruments exhibit distinct effects during market corrections due to their institutional characteristics. General bonds, incorporated into budgetary processes since 2015 (Li, Wu, and Zhang 2023), finance public services and non-revenue infrastructure. During market corrections when land revenues decline, general bond financing becomes

the principal mechanism for maintaining service quality and public investment that support housing demand. Available debt headroom—the gap between actual borrowing and regulatory ceilings—signals fiscal flexibility for counter-cyclical interventions.

Conversely, LGFV leverage exhibits reversed phase-dependent effects. During expansions, rising land prices relax collateral constraints, enabling infrastructure investment that capitalizes into property values (Pan et al. 2017). During corrections, this mechanism inverts: declining collateral values constrain borrowing capacity while accumulated debt service crowds out resources for market stabilization, with local governments facing significantly increased repayment risks (Chen et al. 2023). High LGFV leverage thus transforms from growth catalyst to fiscal burden.

Special-purpose bonds present theoretically ambiguous predictions. These bonds finance revenue-generating projects spanning infrastructure and social facilities, which should enhance urban attractiveness. However, substantial allocation toward affordable housing construction introduces competing supply that may moderate commercial housing prices. The net effect depends on project composition and capitalization lags.

H1: General bond balances and unutilized debt capacity positively predict housing price resilience during adjustment periods, while LGFV debt balances negatively predict resilience. Special-purpose bonds exhibit ambiguous or weak effects. These relationships should be absent or reversed during boom periods.

Spatial differentiation in fiscal capacity. Fiscal structures' impact on housing resilience varies systematically across China's urban system due to differentiated intervention capacities and structural vulnerabilities. Tier 1 cities combine strong fiscal self-sufficiency with binding supply constraints, enabling effective bond-financed interventions that capitalize into prices. Tier 4+ cities rely more heavily on explicit debt with central oversight and implicit guarantees, creating fiscal flexibility despite weaker economic fundamentals. Mid-tier cities (New Tier 1, Tier 2, Tier 3) face greatest vulnerability: aggressive LGFV-financed expansion during booms created high leverage exposure that constrains intervention capacity when land revenues contract. This produces a "barbell effect" with resilience concentrated at hierarchy extremes.

Regionally, Eastern cities' developed fiscal institutions, diversified revenue bases, and binding land constraints should amplify fiscal instruments' effectiveness compared to less-developed regions where weaker administrative capacity and looser supply constraints reduce transmission intensity.

H2: Both Tier 1 and Tier 4+ cities demonstrate greater housing price resilience than mid-tier cities during adjustment periods. Fiscal instruments' effects on housing prices concentrate in Eastern regions with developed institutions and binding supply constraints.

Land supply as mediating mechanism. Administrative control over land and new-home supply links local fiscal conditions to real-estate prices; during the COVID-19 downturn, fiscally land-dependent and highly leveraged cities supported prices via a combination of tighter supply (including reduced issuance of sales permits) and strategically higher LGFV purchases at auctions, amplifying price–volume divergence (Chang, Wang, and Xiong 2025). Whether the fall in land supply reflected deliberate cuts or pandemic frictions is harder to disentangle, but auction failure rates and LGFV behavior indicate active price management; the paper also documents that LGFVs' share of land purchases rose sharply and that indebted cities cut new-home permits while experiencing larger price increases (Chang, Wang, and Xiong 2025).

H3: Land revenue dependency correlates with supply expansion during boom periods but supply restriction during adjustment periods. Land supply mediates the relationship between fiscal conditions

and housing prices, with the direction and magnitude of mediation varying systematically across market phases.

3. Empirical framework

3.1 Research Data and Sample Selection

Our study examines the relationship between fiscal structures and housing price dynamics across Chinese cities during both market expansion and contraction phases. I employ a comprehensive dataset covering 366 Chinese cities from 2015 to 2024, with housing price data primarily sourced from monthly average second-hand housing prices collected from Anjuke, one of China's leading real estate platforms renowned for its extensive market coverage and data reliability. This dataset provides excellent geographical coverage across prefecture-level cities, provincial capitals, municipalities directly under the Central Government, autonomous prefectures, and various special administrative regions, offering consistent measurement that enables robust analysis of spatial differentiation in housing price resilience. I supplement this primary data with the National Bureau of Statistics' 70-city housing price indices as a secondary reference point, particularly for validating trends in major urban centers.

The core fiscal and economic data are integrated from multiple sources. Local government fiscal indicators including general bonds, special bonds, and LGFV debt figures are compiled from the Enterprise Warning Database (qiye yujing tong in Chinese), which systematically tracks local government debt across China's urban system. Macroeconomic and demographic statistics are drawn from China City Statistical Yearbooks, while land supply and transfer data are sourced from China Index Academy databases. This integrated dataset enables us to examine the complex interplay between fiscal structures and housing market performance across varied urban contexts and market phases.

For analytical purposes, I divide the sample into two distinct periods: 2015-2021 representing the market expansion phase and 2022-2024 capturing the subsequent adjustment phase. This periodization reflects the empirical reality that most Chinese cities reached their housing price peaks between mid-2021 and early 2022, with specific timing varying across the urban hierarchy. By comparing these periods, I can identify structural changes in the fiscal-housing relationship across market phases.

3.2 Structural Break Detection Method

To identify critical turning points in China's real estate market, we employ a structural break detection approach to analyze monthly housing price data from April 2015 to December 2024. A multiple breakpoint detection technique was utilized based on the Bai and Perron (1998, 2003) framework, which can simultaneously identify multiple structural change points in time series. Formally, for a time series model with potentially m breakpoints:

$$y_t = x_t'\beta_j + u_t, \quad t = T_{j-1} + 1, \ldots, T_j$$

where $j = 1, \ldots, m+1$ represents intervals, $T_0 = 0$ and $T_{m+1} = T$ are sample boundaries, and $T_1, \ldots, T_m$ denote breakpoint positions to be identified. The breakpoint detection process is solved by minimizing the residual sum of squares (RSS):

$$\min_{T_1,\ldots,T_m} \sum_{j=1}^{m+1} \sum_{t=T_{j-1}+1}^{T_j} [y_t - x_t'\beta_j]^2$$

The optimal number of breakpoints is determined using the Bayesian Information Criterion (BIC):

$$\text{BIC}(m) = \ln \hat{\sigma}^2(m) + (m+1)p\frac{\ln(T)}{T}$$

where $\hat{\sigma}^2(m)$ is the estimated residual variance of the model with m breakpoints, and p is the number of parameters in each segment. I implement this method using the `strucchange` package in R and employ the Chow test to evaluate the statistical significance of identified breakpoints.

3.3 Empirical Model Specification

Our analytical approach combines spatial pattern analysis with panel regression techniques. The spatial analysis maps housing price corrections across cities to identify geographical patterns of market resilience, examining variations across city tiers, regions, and administrative hierarchies. This establishes the empirical puzzle of spatial differentiation that our subsequent regression analysis aims to explain.

Our regression framework employs fixed effects panel models that control for unobserved city-specific characteristics and common time trends. The baseline specification is:

$$\Delta P_{i,t} = \alpha + \beta \cdot \text{Fiscal}_{i,t-1} + \gamma \cdot X_{i,t-1} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

To formally test phase-dependent transformations, we extend this baseline with interaction terms:

$$\Delta P_{i,t} = \alpha + \beta_1 \cdot \text{Fiscal}_{i,t-1} + \beta_2 \cdot (\text{Fiscal}_{i,t-1} \times \mathbb{1}_{\text{Adjustment}}) + \gamma \cdot X_{i,t-1} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

where $\mathbb{1}_{\text{Adjustment}}$ equals one for years 2021-2024 and zero otherwise. The coefficient β_2 directly measures the incremental effect of fiscal variables during adjustment periods, with the total adjustment-period effect given by $\beta_1 + \beta_2$.

Where:

- $\Delta P_{i,t}$ represents housing price growth in city i at time t
- $\text{Fiscal}_{i,t-1}$ represents lagged fiscal variables including:
  - General bond balance to GDP ratio
  - Special-purpose bond balance to GDP ratio
  - LGFV debt balance to GDP ratio
  - Fiscal self-sufficiency ratio
  - Land finance dependency (land transfer revenue to fiscal revenue ratio)
  - Unutilized debt capacity
- $X_{i,t-1}$ represents control variables including:

  - Economic growth (GDP growth rate)
  - Industrial structure (tertiary industry ratio)
  - Population growth rate
  - Housing affordability (housing price to income ratio)

- μ_i and λ_t represent city and time fixed effects
- $\varepsilon_{i,t}$ is the error term

We estimate both the baseline model for the full sample and the interaction model to formally test phase-dependent effects. Additionally, we estimate the baseline specification separately for different subsamples defined by market phase (boom period 2015-2021 vs. adjustment period 2022-2024), region (Eastern, Central, Western, and Northeastern China), and urban hierarchy position (Tier 1, New Tier 1, Tier 2, Tier 3, and Tier 4+ cities) to examine spatial heterogeneity in fiscal-housing relationships.

3.4 Land Supply Role Analysis

I analyze how land supply mediates the relationship between fiscal structures and housing prices across market phases. Our investigation examines whether land supply functions as a mediator transmitting fiscal influences to housing markets, or as a suppressor variable that enhances these relationships, with focus on transformations between market expansion and contraction.

I follow Baron and Kenny (1986) 's three-step procedure: first assessing the total effect of fiscal variables on housing prices; then analyzing fiscal variables' influence on land supply; and finally examining the direct effect of fiscal variables on housing prices while controlling for land supply. By comparing coefficient changes between total and direct effects, I identify whether land supply acts as a mediator (coefficients decrease) or exhibits suppression effects (coefficients increase or change sign).

I conduct identical analyses for both the expansion period (2015-2021) and adjustment period (2022-2024) to compare land supply's evolving function. This approach allows us to determine whether land supply transforms from a strategic market tool during booms to a fiscal pressure transmission channel during corrections.

This framework examines both direct and indirect pathways through which fiscal structures affect housing price resilience, particularly how these pathways reconfigure during market transitions. Our approach recognizes land supply's dynamic role within China's fiscal-property nexus, providing an institutional explanation for spatially differentiated housing price corrections.

3.5 Robustness Tests

To ensure the reliability of our findings, I conduct two main robustness checks. First, I employ alternative periodization using 2021 as the cutoff between boom and adjustment periods to account for varying peak timing across the urban hierarchy. This addresses the observation that many higher-tier cities reached their price peaks earlier than the January 2022 baseline used in our primary analysis. Second, I compare our dataset with the official National Bureau of Statistics 70-city housing price indices to validate the spatial patterns of market adjustment. While the limited sample size of the official data precludes its use in regression analysis, it serves as an important reference point for verifying the observed patterns of housing price corrections across different city tiers and regions. This comparison confirms that both

datasets capture similar spatial differentiation in market resilience, with the "barbell effect" across the urban hierarchy and regional variations in price corrections.

These robustness checks confirm that our core findings regarding the transformation of fiscal-housing relationships across market phases remain consistent regardless of periodization choices or data sources, enhancing the credibility of our conclusions about how fiscal structures shape housing price resilience across China's urban system.

4. Spatiotemporal Patterns of China's Housing Market Adjustment

4.1 Temporal Evolution and Structural Breakpoints

The Chinese housing market has exhibited distinct cyclical patterns with significant variation in peak timing across the urban hierarchy. Figure 1 illustrates the temporal distribution of market peaks across city tiers. According to the median peak dates, the majority of Chinese cities reached their price peaks between mid-2021 and early 2022: Tier 3 cities in May 2021, Tier 2 cities in July 2021, New Tier 1 cities in August 2021, and Tier 4 and below cities in January 2022, with only Tier 1 cities peaking later in August 2022.

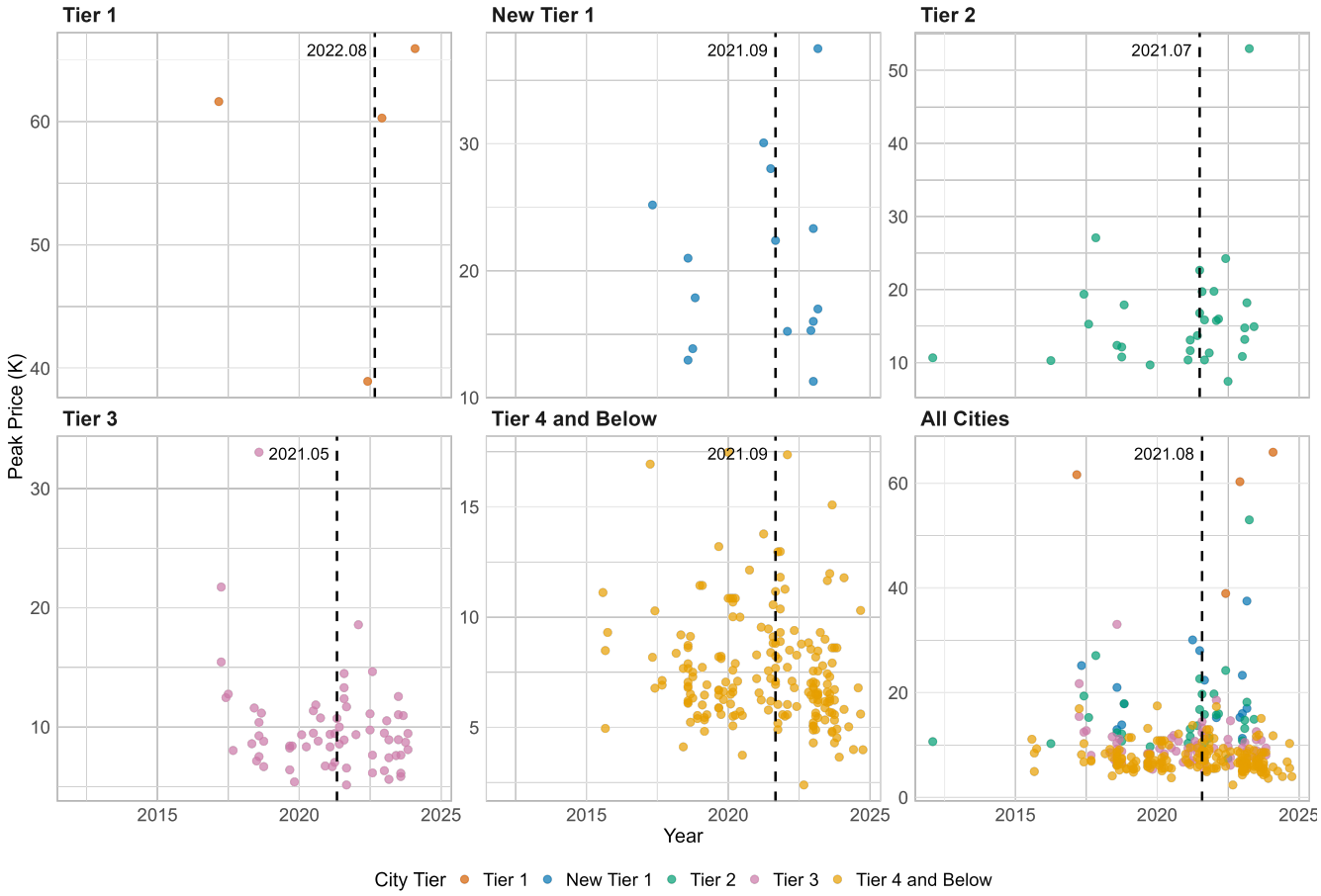

Figure 1: Housing Price Changes by City Tier and Region (Peak-to-2024 and 2022-2024)

Utilizing a balanced panel of monthly housing prices (n=186), the breakpoint regression analysis reveals that China's real estate market experienced four statistically significant structural change points between April 2015 and December 2024: December 2016, October 2018, September 2021, and May 2023 (as illustrated in Figure 2).

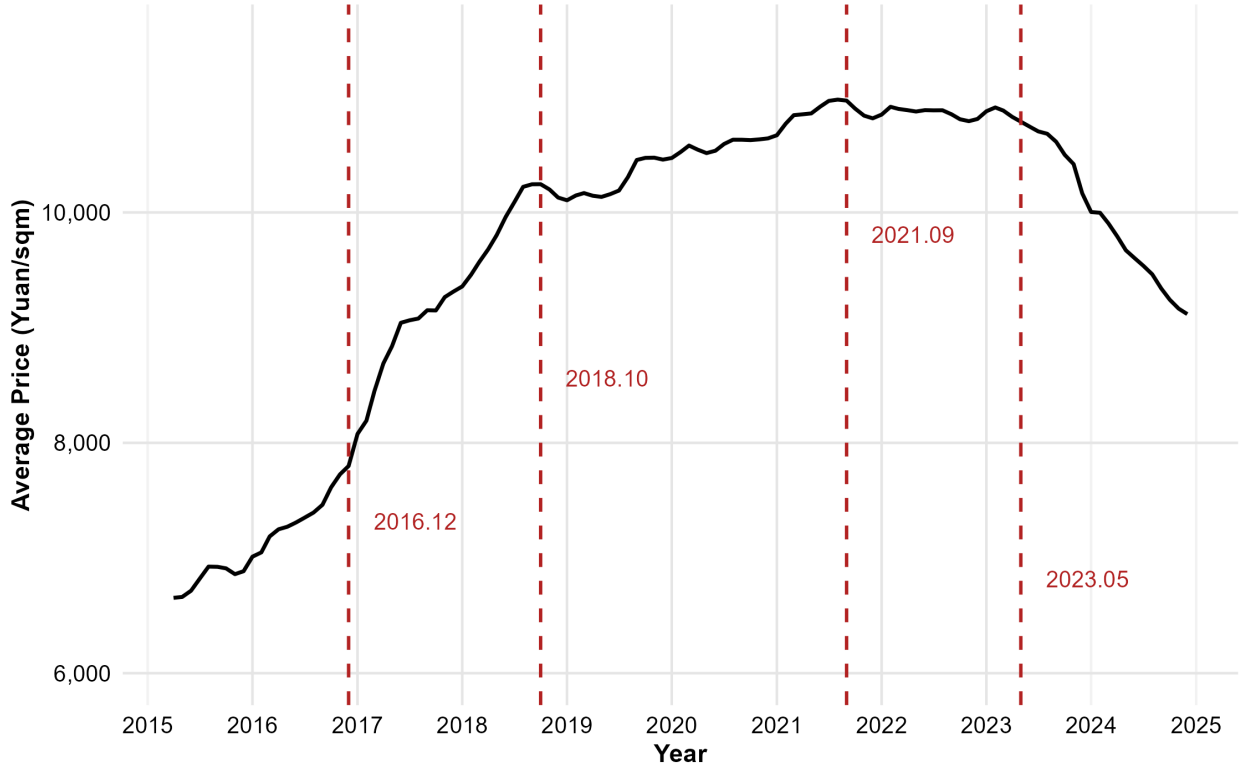

Figure 2: Structural Breakpoints in China's Housing Market Prices, 2015-2025

The Chow test confirms that all identified breakpoints are statistically significant at the 1% level, verifying that these time points indeed represent structural shifts in price trends. Segmented regression analysis further illuminates the characteristics of each market phase. During the first two phases, housing prices rose rapidly at average monthly rates of 1% and 1.2%, respectively. Between October 2018 and September 2021 (coinciding precisely with the collapse of Evergrande), the growth rate decelerated significantly to 0.2%, reflecting a market adjustment transition period. Subsequently, the monthly growth rate turned negative at -0.07%, signaling the market's entry into a downturn. Following May 2023, the downward trajectory intensified substantially, with prices declining at an average monthly rate of -0.84%.

The spatial diffusion of housing price decline in China after 2021 reveals distinctive geographical patterns. Northeastern provinces (Heilongjiang), Inner Mongolia, areas surrounding Beijing, Guangxi, the outer Pearl River Delta, and some non-central western cities were the first to experience continuous price drops, as shown in dark purple. Interestingly, the map demonstrates a clear "siphoning effect" around first-tier cities like Beijing and Guangzhou, where surrounding cities began declining earlier than the core cities themselves. In contrast, the Yangtze River Delta, southern provinces (particularly Hunan and Jiangxi), and Shaanxi exhibited greater price resilience, experiencing declines significantly later.

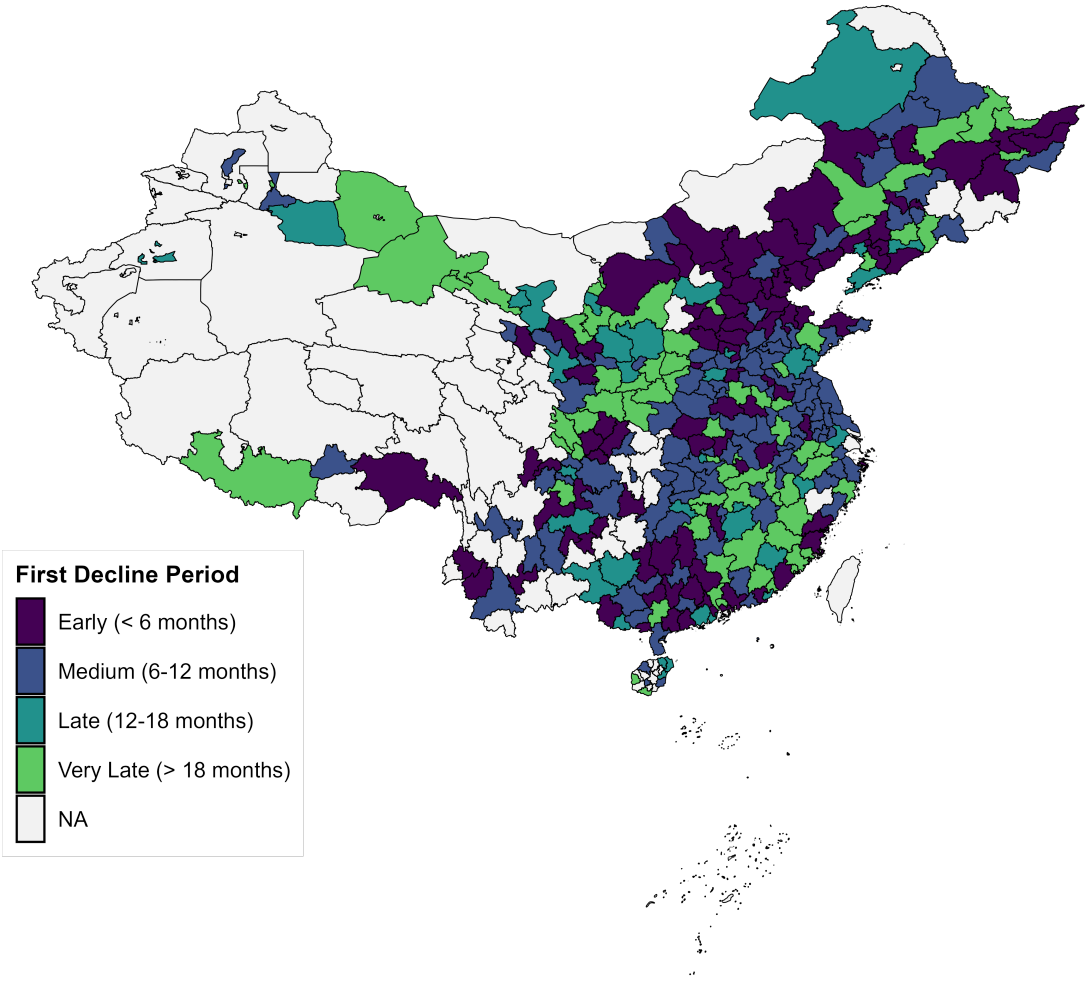

Figure 3: Spatial diffusion of housing price decline after 2021

Based on the breakpoint regression analysis and the temporal distribution of housing price peaks across cities, I select January 2022 as the demarcation point between boom and bust periods. While the structural breakpoint analysis identifies September 2021 as a significant change point, using 2022 is methodologically necessary as city-level explanatory variables are only available in annual rather than monthly intervals. Additionally, the 2022 threshold ensures that most cities in the sample had entered or were about to enter their downward trajectory, allowing for more comprehensive measurement of market correction patterns. Alternative specifications using 2021 as the threshold are employed in robustness checks to account for the earlier structural break and the earlier peaks observed in higher-tier cities.

4.2 Spatial Heterogeneity in Housing Price Resilience

A distinctive "barbell effect" characterizes the magnitude of housing price corrections across the urban hierarchy (Figure 4). Both Tier 1 cities (-17.2% from peak, -8.60% during 2022-2024) and Tier 4+ cities (-15.1% from peak, -7.42% during 2022-2024) demonstrate substantially greater price resilience compared

to mid-tier cities. New Tier 1, Tier 2, and Tier 3 cities experienced significantly more pronounced corrections, with peak-to-2024 declines of -25.8%, -26.6%, and -22.1% respectively. This U-shaped resilience distribution challenges conventional expectations that higher-tier cities would universally demonstrate superior market stability.

Geographic patterns reveal additional complexity beyond the urban hierarchy effects. The East region experienced the most severe corrections (-25.2% from peak, -16.7% during 2022-2024), closely mirroring the vulnerability of mid-tier cities. In contrast, the West region exhibited remarkable resilience (-12.3% from peak, -5.29% during 2022-2024), performing even better than Tier 1 cities, with a quarter of its cities experiencing no net decline or even price increases since 2022. Central (-19.9% from peak, -12.5% during 2022-2024) and Northeast (-16.9% from peak, -10.1% during 2022-2024) regions fell between these extremes. This geographic divergence suggests that regional economic fundamentals and policy implementations may exert influence comparable to, or even exceeding, the effects of urban hierarchy positioning.

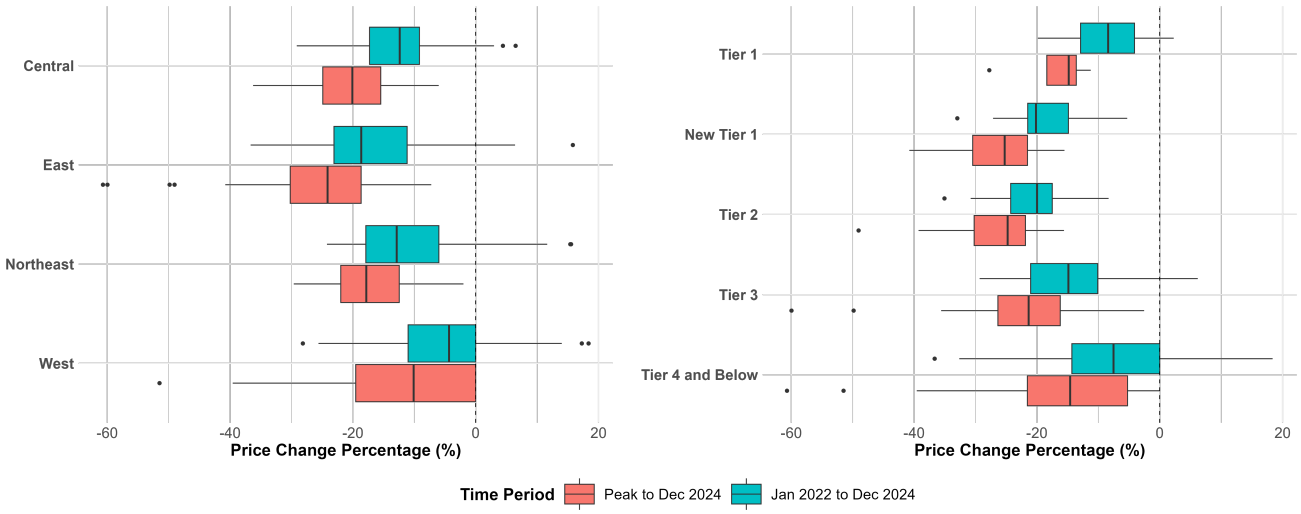

Figure 4: Housing Price Changes by City Tier and Region (Peak-to-2024 and 2022-2024)

Figure 5 reveals further spatial differentiation, with Western regions showing the strongest resilience (-12.3% from peak), followed by Northeastern (-16.9%), Central (-19.9%), and Eastern regions (-25.2%). This pattern presents a noteworthy inversion of traditional regional development hierarchies, as economically advanced Eastern regions experienced the most severe corrections rather than less developed areas. Figure 4's spatial distribution map confirms substantial intra-regional variation, particularly within Eastern and Central China, with pronounced correction clusters in the Yangtze River Delta, Pearl River Delta, and certain Central provincial capitals.

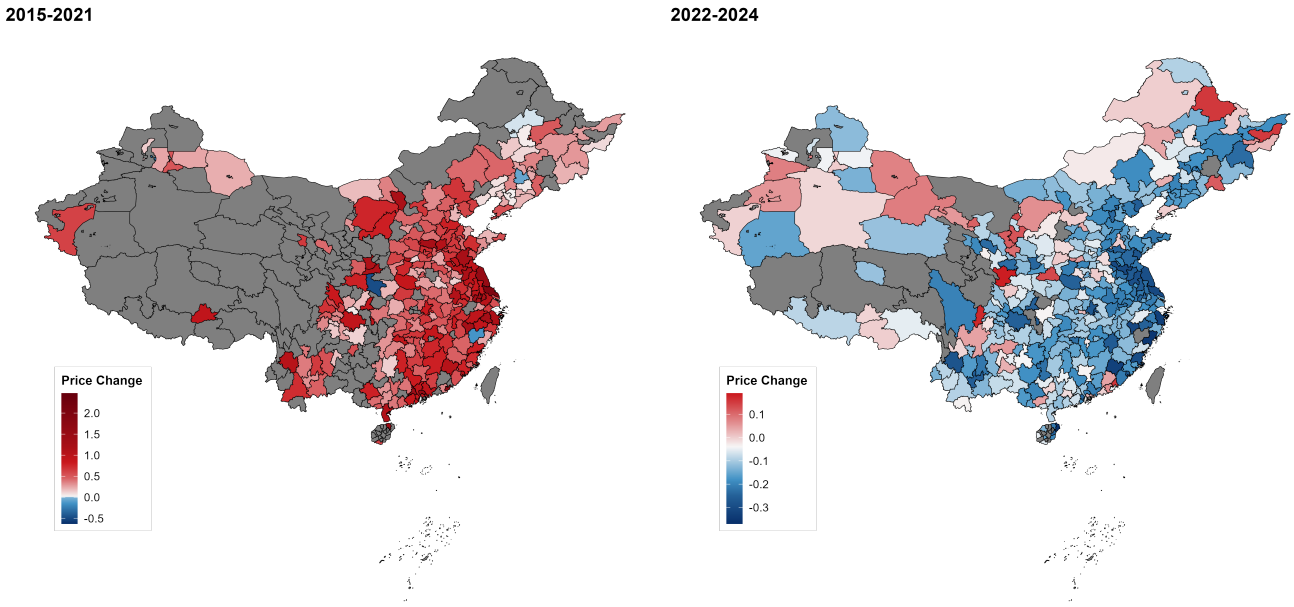

Figure 5: Housing Price Changes During Boom and Adjustment Periods Across 366 Chinese Cities

4.3 Fiscal Indicators and Structural Transformation

The evolution of fiscal indicators across city tiers, depicted in Figure 6 and Table 1, reveals structural disparities and temporal transformations that potentially explain the observed housing price resilience patterns.

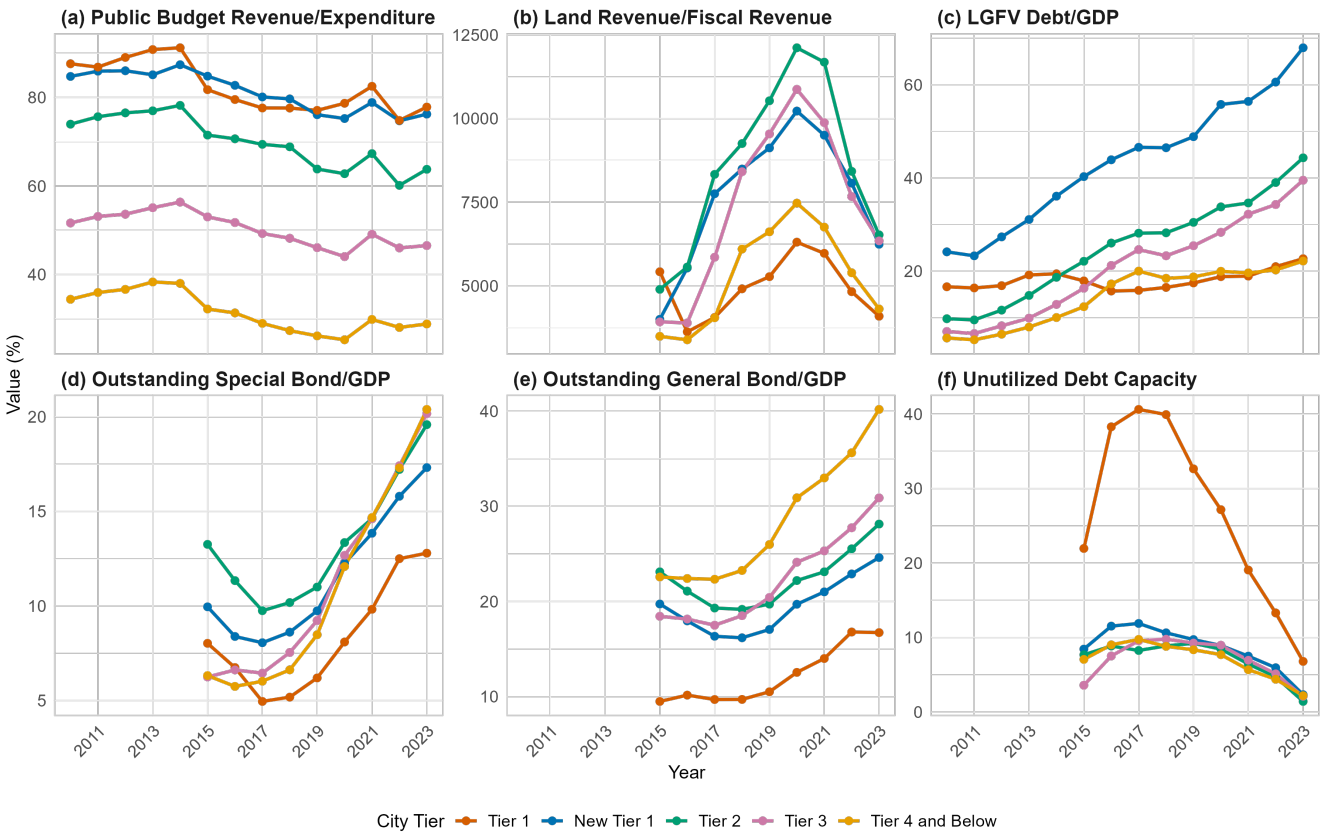

Figure 6: Fiscal Indicator Trends by City Tier (2010-2023)

Table 1: Descriptive Statistics by City Tier and Year (Mean Values)

	Tier 1 (n=4)			New Tier 1 (n=15)			Tier 2 (n=30)			Tier 3 (n=65)			Tier 4 and Below (n=252)		
Variable	2015	2021	2023	2015	2021	2023	2015	2021	2023	2015	2021	2023	2015	2021	2023
Housing Price Growth Rate	0.148	0.027	-0.004	-0.012	0.063	-0.028	-0.002	0.034	-0.042	-0.088	0.027	-0.012	-0.164	0.016	0.001
Fiscal Self-Sufficiency Rate	0.817	0.825	0.778	0.848	0.789	0.762	0.715	0.673	0.638	0.530	0.491	0.465	0.322	0.298	0.288
Land Revenue/Fiscal Revenue	0.542	0.597	0.409	0.400	0.950	0.624	0.489	1.169	0.652	0.392	0.988	0.634	0.349	0.675	0.431
Unutilized Debt Capacity	0.220	0.191	0.068	0.084	0.075	0.023	0.077	0.064	0.014	0.036	0.069	0.021	0.071	0.057	0.022
General Bond Balance/GDP	0.101	0.042	0.039	0.084	0.072	0.073	0.114	0.085	0.085	0.130	0.107	0.107	0.156	0.184	0.198
Special Bond Balance/GDP	0.080	0.098	0.128	0.100	0.138	0.173	0.133	0.146	0.196	0.062	0.146	0.202	0.063	0.147	0.204
LGFV Debt Balance/GDP	0.179	0.189	0.227	0.403	0.564	0.679	0.221	0.346	0.443	0.163	0.322	0.395	0.124	0.196	0.222
Land Supply/Population	0.352	0.561	0.430	1.242	1.144	0.831	1.094	1.283	0.960	1.206	1.340	1.118	0.779	1.144	0.872
GDP Growth Rate	0.078	0.081	0.052	0.088	0.080	0.053	0.082	0.078	0.054	0.083	0.077	0.056	0.078	0.077	0.054
Tertiary Industry Ratio	0.684	0.723	0.704	0.524	0.581	0.579	0.482	0.536	0.532	0.418	0.479	0.488	0.409	0.463	0.466
Population Growth Rate	0.029	0.002	0.004	0.024	0.014	0.006	0.022	0.007	0.004	0.002	0.001	-0.002	-0.004	0.001	0.006
Housing Price-to-Income Ratio	0.657	0.654	0.632	0.266	0.305	0.278	0.254	0.275	0.239	0.202	0.212	0.192	0.188	0.175	0.163

Fiscal self-sufficiency ratios (Figure 6 a) and local government outstanding debt (Figure 5d) display complementary mirror-image patterns, revealing the fundamental fiscal dilemma facing different tiers of Chinese cities. Self-sufficiency ratios exhibit a clear hierarchical pattern, decreasing progressively from Tier 1 to Tier 4+ cities, while outstanding debt burdens show the inverse relationship. This complementary pattern reflects the strategic tradeoffs in China's fiscal system: cities with stronger tax bases and self-generating revenues (higher-tier cities) can maintain lower formal debt levels, while cities with weaker revenue-generating capacity (lower-tier cities) must increasingly rely on explicit debt financing to fulfill development and service obligations. All city tiers show declining self-sufficiency since 2015, but the steepest deterioration appears in Tier 4+ cities, where self-sufficiency dropped below 30% by 2023, accompanied by formal debt burdens approaching 40% of GDP—the highest among all tiers.

Land transfer revenue dependency (Figure 6 b) exhibits pronounced cyclical fluctuations with a precipitous decline after 2020. Tier 2 cities reached the highest peak at 121% in 2020, followed by Tier 3 (109% in 2020) and New Tier 1 cities (102% in 2020), indicating that land sales revenues exceeded annual fiscal revenue in these mid-tier cities during the boom period. Following the peak, all tiers experienced sharp contractions: by 2023, Tier 2 cities declined to 65%, New Tier 1 to 62%, and Tier 3 to 63%. Notably, Tier 1 cities maintained more moderate land finance dependency throughout, peaking at 63% in 2020 and declining to 41% by 2023, while Tier 4+ cities showed the lowest dependency, reaching only 75% at peak (2020) and falling to 43% by 2023. This revenue contraction preceded or coincided with housing price corrections, suggesting that land market cooling functions as a leading indicator for housing price declines.

LGFV debt (Figure 6 c) presents a distribution pattern contrary to explicit debt, with the highest ratios in New Tier 1 cities, which increased dramatically from approximately 24% in 2010 to nearly 70% in 2023—a threefold increase. Tier 2 cities follow with approximately 44% in 2023, while both Tier 1 and Tier 4+ cities maintain relatively lower implicit debt ratios around 22%. This pattern reflects the differentiated financing strategies across city tiers: mid-tier cities (New Tier 1 and Tier 2) have most aggressively leveraged market-oriented financing vehicles operated by LGFVs, which typically fund infrastructure and urban development projects expected to generate returns through land value appreciation.

Outstanding special purpose bonds (Figure 6 d) show rapid growth across all tiers since 2016, with lower-tier cities (Tiers 2-4+) converging at approximately 20% by 2023, significantly higher than Tier 1 cities' 13%. Similarly, outstanding general bonds (Figure 6 e) demonstrate an inverse relationship with city tier, with Tier 4+ cities approaching 20% in 2023 while Tier 1 cities remain at approximately 4%. This composition of explicit debt reflects their distinct purposes: special purpose bonds primarily fund revenue-generating infrastructure projects, while general bonds primarily finance public welfare projects without direct revenue streams. Figure 6 f shows that local governments' unutilized debt capacity briefly increased from 2015-2017, followed by a rapid decline, especially in first-tier cities. By 2023, all city categories had converged to debt capacity levels below 10%, indicating a significant reduction in fiscal flexibility across China's urban hierarchy.

This comprehensive fiscal structure differentiation corresponds closely with observed housing price correction patterns. New Tier 1 and Tier 2 cities exhibit a characteristic combination of "high implicit debt, low explicit debt" while Tier 3 and Tier 4+ cities demonstrate "high explicit debt, relatively lower implicit debt," and Tier 1 cities maintain comparatively moderate overall debt burdens. This differentiation reflects fundamental differences in financing strategies and capabilities: mid-tier cities have more aggressively pursued market-oriented financing through LGFVs to fund growth-enhancing infrastructure, creating greater exposure to market volatility when revenue streams from land sales contract. Lower-tier cities, with less access to market-based financing, have relied more heavily on explicit government bonds

with their formal repayment guarantees and central government oversight, potentially creating more stable but constrained fiscal environments. Tier 1 cities, with their robust revenue bases, have maintained greater fiscal space with moderate reliance on both financing channels.

4.4 Boom-Bust Asymmetry and the Limited Role of Mean Reversion

Before examining the specific mechanisms through which fiscal structures shape housing price resilience, we must address a fundamental alternative explanation: could the observed spatial heterogeneity simply reflect mechanical mean reversion? That is, do cities that experienced larger boom-period appreciations naturally experience proportionally larger corrections, regardless of fiscal conditions?

Figure 7 provides compelling evidence against this simple explanation. If housing markets exhibited perfect mean reversion, we would expect a symmetric relationship where boom-period appreciation directly predicts adjustment-period decline with a slope of 1.0 (represented by the dashed blue line). Under perfect symmetry, a city experiencing 50% appreciation during 2015-2021 would decline by approximately 50% during 2022-2024. The actual relationship, however, shows a slope of only 0.070, falling far below the perfect symmetry benchmark. This means a city that appreciated 100% during the boom period would only decline by approximately 7% during the adjustment period, revealing significant downward price stickiness rather than mechanical mean reversion.

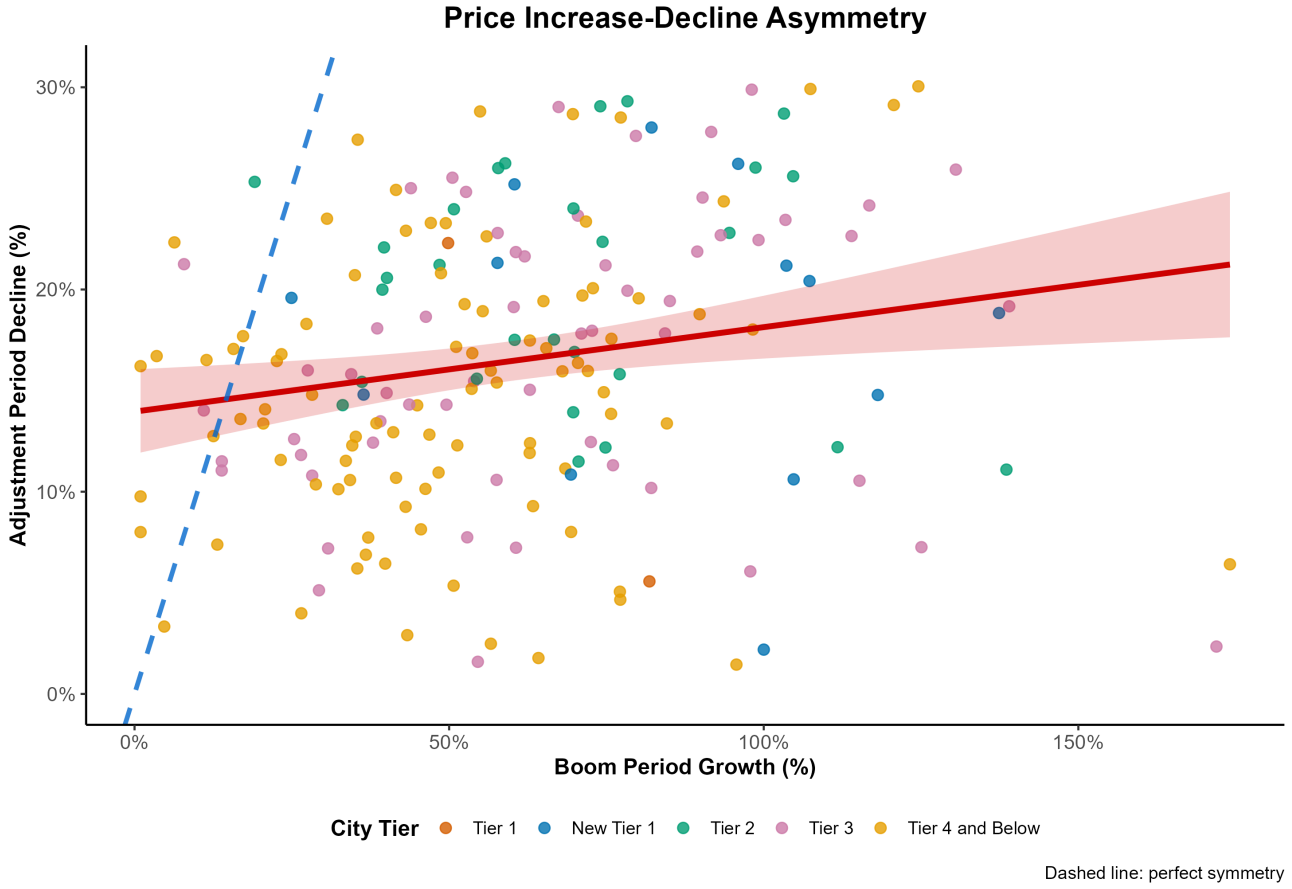

Figure 7: Boom-Bust Price Asymmetry Across Chinese Cities

Table 2: Prior Appreciation vs. Fiscal-Structural Determinants

Model	Prior Growth Coef.	R^2	ΔR^2	N
(1) Prior Appreciation Only	0.075 ***	0.090	–	188
(2) + Fiscal Variables	0.056 ***	0.202	+ 0.112	188
(3) + All Controls	0.054 ***	0.222	+ 0.132	188

Note: Dependent variable is adjustment period price decline (2022-2024). Fiscal variables include general bonds, special bonds, LGFV debt, fiscal self-sufficiency, land revenue, and unutilized debt capacity. All controls add GDP growth, tertiary industry ratio, population growth, and price-income ratio. *** $p < 0.01$

To formally test whether fiscal-structural factors provide explanatory power beyond simple mean reversion, Table 2 presents a nested model comparison. Model (1) examines prior appreciation alone, directly testing the mean reversion hypothesis. Model (2) adds fiscal variables—general bonds, special bonds, LGFV debt, fiscal self-sufficiency, land revenue dependency, and unutilized debt capacity. Model (3) includes comprehensive economic controls.

The results establish three key findings. First, mean reversion alone has limited explanatory power, explaining only 9% of the variation in adjustment-period declines ($R^2 = 0.090$). Second, adding fiscal variables increases R^2 to 20.2%, representing a 124% improvement in explanatory power ($\Delta R^2 = +0.112$). Importantly, the prior appreciation coefficient decreases by 25% when fiscal variables are included, indicating that some apparent mean reversion actually reflects underlying fiscal conditions. Third, these patterns remain robust with comprehensive controls ($R^2 = 0.222$), confirming that fiscal-structural determinants, not mechanical mean reversion, drive spatial heterogeneity in housing price resilience.

Having established that fiscal-structural factors dominate mean reversion dynamics, we now turn to examining the specific mechanisms through which different fiscal instruments shape housing price resilience across market phases.

5. The Fiscal-Property Nexus

Our panel regression results in Table 3 reveal striking transformations in how local government fiscal structures influence housing price dynamics across market phases, illuminating the mechanisms of the fiscal-property resilience nexus.

5.1 Phase-Dependent Transformation of Fiscal Effects

Table 3 reveals striking transformations in how local government fiscal structures influence housing price dynamics across market phases. Column (2)'s interaction model formally tests these phase-dependent effects, with a joint F-test strongly rejecting coefficient stability across phases ($F = 18.7$, $p < 0.001$).

5.1.1 Three Fiscal Instruments Exhibit Significant Transformations

LGFV Debt: From Catalyst to Burden. LGFV debt's effect reverses from positive during booms (0.11***, Column 3) to significantly negative during adjustments (-0.24***, Column 4), with the interaction term confirming this transformation (β = -0.10***, t = -5.0). As implicit debt accumulates, debt

Table 3: Fiscal-Housing Price Relationships Across Market Phases

	Full Period	Interaction	Boom Phase	Adjustment Phase
Price Change (t-1)	0.32^{***}	0.32^{***}	0.16^{***}	0.26^{***}
	(0.02)	(0.02)	(0.03)	(0.05)
General Bond/GDP (t-1)	0.44^{***}	0.35^{***}	0.24^{*}	0.11
	(0.09)	(0.09)	(0.13)	(0.16)
Special Bond/GDP (t-1)	-0.86^{***}	-0.45^{***}	-0.63^{***}	-0.79^{***}
	(0.05)	(0.09)	(0.10)	(0.11)
Fiscal Self-Sufficiency (t-1)	0.14^{***}	0.09^{*}	0.32^{***}	0.04
	(0.05)	(0.05)	(0.05)	(0.06)
Unutilized Debt Capacity (t-1)	0.26^{***}	0.26^{***}	0.14^{*}	0.67^{***}
	(0.05)	(0.05)	(0.08)	(0.09)
Land Revenue/Fiscal Revenue (t-1)	-0.02^{**}	-0.04^{***}	-0.08^{***}	0.04^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
LGFV Bond/GDP (t-1)	-0.06^{***}	0.01	0.11^{***}	-0.24^{***}
	(0.02)	(0.03)	(0.04)	(0.05)
GDP Growth Rate (t-1)	-0.02	-0.06	0.01	-0.30^{***}
	(0.07)	(0.07)	(0.12)	(0.09)
Tertiary Industry Ratio (t-1)	-0.09	-0.15^{**}	0.22^{**}	-0.10
	(0.07)	(0.07)	(0.10)	(0.14)
Population Growth Rate (t-1)	0.04	0.03	0.07	-0.03
	(0.04)	(0.04)	(0.05)	(0.07)
Housing Price-Income Ratio (t-1)	-1.49^{***}	-1.59^{***}	-1.02^{***}	-1.65^{***}
	(0.09)	(0.09)	(0.09)	(0.20)
General Bond/GDP × Adjustment		-0.03		
		(0.04)		
Special Bond/GDP × Adjustment		-0.34^{***}		
		(0.07)		
LGFV Bond/GDP × Adjustment		-0.10^{***}		
		(0.02)		
Land Revenue/Fiscal Revenue × Adjustment		0.05^{***}		
		(0.01)		
City Fixed Effects	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.46	0.50	0.35	0.51
Num. obs.	1733	1733	1029	754

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

servicing crowds out resources for market interventions while central government regulatory pressure limits high-debt localities' intervention capacity.

Special Bonds: Intensified Suppression. Special-purpose bonds exhibit the strongest negative effect in our analysis, intensifying from -0.63*** during booms to -0.79*** during adjustments (interaction: -0.34***, t = -4.9). This dual-phase suppression reflects their role as policy cooling instruments during expansions and their reallocation toward affordable housing acquisition during corrections, which introduces competing government-owned supply into secondary markets.

Land Finance: Strategic Reversal. Land transfer revenue dependency transforms from negative (-0.08*** during booms) to positive (0.04*** during adjustments), with a highly significant interaction term (0.05***, t = 5.0). High-dependency cities strategically shift from expansionary supply to restrictive supply during corrections to maintain land values and fiscal stability.

5.1.2 General Bonds Show No Significant Phase Transformation

In contrast to initial expectations, general bonds demonstrate a consistently positive relationship (0.35***, Column 2) with no significant interaction effect (-0.03, p > 0.1). While split-sample estimates suggested possible counter-cyclical transformation (0.24* in booms vs. 0.11 in adjustments), the interaction model indicates this apparent shift may reflect statistical power differences rather than genuine mechanism change. General bonds appear to provide steady support throughout market cycles rather than specifically counter-cyclical stabilization.

5.1.3 Control Variables and Debt Capacity

Unutilized debt capacity shows strong positive effects in both phases but with dramatically larger magnitude during adjustments (0.67*** vs. 0.14* during booms), highlighting fiscal flexibility's critical role during market stress. Housing price-income ratios exhibit stronger negative effects during adjustments (-1.65*** vs. -1.02***), confirming affordability constraints bind more tightly when markets weaken. Fiscal self-sufficiency's positive effect during booms (0.32***) weakens and becomes insignificant during adjustments (0.04), possibly because market downward pressure overwhelms fiscal capacity advantages.

5.2 Regional Differentiation

Table 4 reveals a striking spatial concentration: fiscal instruments significantly influence housing prices only in Eastern regions, while other regions show limited fiscal-housing linkages. This East-West divide in transmission mechanisms reflects fundamental differences in fiscal capacity and market structures.

Three fiscal instruments show significant positive effects: general bond balance (0.63**), fiscal self-sufficiency (0.15**), and unutilized debt capacity (0.28**). This concentration suggests that economically advanced coastal areas possess both the fiscal resources and institutional capacity to effectively deploy fiscal tools for market stabilization. Bond-financed investments more readily capitalize into housing values where land constraints are binding and fiscal institutions are developed.

In contrast, Central, Northeastern, and Western regions exhibit weak or absent fiscal-housing relationships. Only one significant fiscal effect emerges across these three regions: land revenue dependency in Central China (0.04***), reflecting these cities' heavy reliance on land sales amid limited alternative

Table 4: Regional Heterogeneity in Fiscal-Housing Price Resilience During Market Adjustment Phase

	East	Central	Northeast	West
	(1)	(2)	(3)	(4)
Price Change (t-1)	0.23***	0.23***	−0.14	0.24***
	(0.06)	(0.08)	(0.17)	(0.08)
General Bond/GDP (t-1)	0.63**	0.02	0.09	0.15
	(0.29)	(0.26)	(0.40)	(0.22)
Special Bond/GDP (t-1)	0.18	0.11	−0.35	0.08
	(0.15)	(0.18)	(0.41)	(0.17)
Fiscal Self-Sufficiency (t-1)	0.15**	−0.17	−0.004	0.05
	(0.07)	(0.12)	(0.14)	(0.09)
Unutilized Debt Capacity (t-1)	0.28**	0.12	0.28	0.23
	(0.12)	(0.10)	(0.41)	(0.15)
Land Revenue/Fiscal Revenue (t-1)	0.01	0.04***	−0.01	0.02
	(0.01)	(0.01)	(0.06)	(0.02)
LGFV Bond/GDP (t-1)	−0.05	−0.18	−0.07	−0.05
	(0.05)	(0.12)	(0.07)	(0.11)
GDP Growth Rate (t-1)	−0.15	0.07	−0.33	0.09
	(0.16)	(0.16)	(0.34)	(0.18)
Tertiary Industry Ratio (t-1)	0.09	0.10	0.09	−0.18
	(0.21)	(0.17)	(0.60)	(0.18)
Population Growth (t-1)	0.32	0.18	−0.08	−0.10
	(0.38)	(0.28)	(0.07)	(0.45)
Housing Price-Income Ratio (t-1)	−1.98***	−3.50***	−1.48*	−3.36***
	(0.21)	(0.34)	(0.74)	(0.29)
City Fixed Effects	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
Observations	233	196	83	239
R^2	0.48	0.51	0.21	0.54
Note:	Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1			

revenue sources. The widespread insignificance of fiscal variables in non-Eastern regions indicates either genuinely weaker transmission channels or constraints on local governments' ability to convert fiscal resources into market support during adjustments.

These patterns underscore the spatially variegated nature of China's fiscal-property nexus, where identical fiscal instruments produce heterogeneous outcomes depending on regional context. The concentration of significant effects in Eastern regions challenges assumptions about uniform policy transmission and suggests that fiscal interventions operate through fundamentally different mechanisms across China's regionally differentiated urban landscape.

5.3 City-Tier Differentiation

Table 5 reveals a non-linear pattern in fiscal instrument effectiveness: both top-tier and bottom-tier cities show significant fiscal-housing relationships, while mid-tier cities (Tier 2) display limited linkages. This challenges conventional assumptions about linear urban hierarchy effects.

General bonds demonstrate the clearest tier-based heterogeneity. Significant positive effects appear in Tier 1 and New Tier 1 cities (2.47*), Tier 3 (0.53*), and Tier 4 and below (0.41***), but not in Tier 2 (0.19). The large Tier 1 and New Tier 1 coefficient, despite wide confidence intervals due to small sample size (n=54), suggests bond-financed investments may generate premium effects in supply-constrained metropolitan areas. Conversely, special-purpose bonds show negative effects only in Tier 1 and New Tier 1 cities (-1.06*), consistent with central government targeting of affordable housing interventions toward overheated markets.

Bottom-tier cities reveal distinct fiscal mechanisms. LGFV debt burdens significantly constrain housing prices only in Tier 4 and below cities (-0.14***), indicating that implicit debt particularly binds in localities with weaker fiscal fundamentals. Meanwhile, land revenue dependency shows significant positive effects exclusively in Tier 4 and below (0.03***), reflecting the continued importance of land finance in smaller cities' fiscal-property dynamics.

The tertiary industry ratio exhibits opposing effects across tiers: strongly positive in Tier 1 and New Tier 1 cities (1.92***) versus significantly negative in Tier 4 and below (-0.29**), suggesting service sector growth supports housing values in amenity-rich metros but may signal economic weakness in smaller cities. These tier-specific patterns, combined with regional heterogeneity, demonstrate that fiscal-housing transmission operates through differentiated mechanisms across China's urban hierarchy. Top-tier cities leverage general bonds and service sector amenities; bottom-tier cities depend on land finance but face LGFV debt constraints; mid-tier cities show surprisingly weak fiscal-housing linkages despite their intermediate position. This heterogeneity implies that effective policy interventions require context-specific calibration rather than uniform national approaches.

6. The Functional Transformation of Land Supply

Building on our regional and city-tier analyses, this section examines the more nuanced functional relationship between fiscal variables and housing price growth by introducing land supply as a mediating mechanism. The mediation analysis (Table 10) disentangles the total effect of fiscal variables on housing prices into direct effects and indirect effects transmitted through land supply, revealing a more complex fiscal-property nexus that varies across market conditions.

Table 5: City Tier Heterogeneity in Fiscal-Housing Price Resilience During Market Adjustment Phase

	T1+NT1	Tier 2	Tier 3	T4+Below
	(1)	(2)	(3)	(4)
Price Change (t-1)	0.18	0.12	0.34***	0.12**
	(0.14)	(0.11)	(0.08)	(0.05)
General Bond/GDP (t-1)	2.47*	0.19	0.53*	0.41***
	(1.22)	(0.55)	(0.27)	(0.14)
Special Bond/GDP (t-1)	−1.06*	−0.10	−0.02	0.05
	(0.59)	(0.25)	(0.19)	(0.12)
Fiscal Self-Sufficiency (t-1)	−0.16	0.12	−0.01	0.09
	(0.22)	(0.11)	(0.08)	(0.07)
Unutilized Debt Capacity (t-1)	−0.02	−0.19	0.38**	0.02
	(0.17)	(0.21)	(0.15)	(0.10)
Land Revenue/Fiscal Revenue (t-1)	−0.02	−0.02	0.01	0.03***
	(0.05)	(0.02)	(0.02)	(0.01)
LGFV Bond/GDP (t-1)	−0.18	−0.09	−0.05	−0.14***
	(0.21)	(0.09)	(0.06)	(0.05)
GDP Growth Rate (t-1)	0.48	0.22	0.02	−0.06
	(0.47)	(0.34)	(0.17)	(0.12)
Tertiary Industry Ratio (t-1)	1.92***	−0.39	−0.38	−0.29**
	(0.57)	(0.36)	(0.27)	(0.13)
Population Growth (t-1)	0.23	1.30	0.28	0.03
	(0.48)	(1.17)	(0.34)	(0.05)
Housing Price-Income Ratio (t-1)	−1.86***	−1.53***	−2.26***	−3.09***
	(0.35)	(0.37)	(0.32)	(0.24)
City Fixed Effects	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
Observations	54	77	169	451
R^2	0.76	0.58	0.47	0.45
Note:	Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1			

Table 6: Fiscal-Housing Price Relationship: Mediation Analysis Across Market Phases

	Full Period			Boom Period			Adjustment Period		
	Total	Path A	Direct	Total	Path A	Direct	Total	Path A	Direct
House Price Change Rate (t-1)	0.215^{***}	0.282^{*}	0.204^{***}	0.104^{***}	0.430^{***}	0.095^{***}	0.197^{***}	-0.323	0.014
	(0.022)	(0.161)	(0.024)	(0.030)	(0.152)	(0.030)	(0.042)	(0.778)	(0.062)
General Bond Balance/GDP (t-1)	0.362^{***}	-0.504	0.389^{***}	0.024	0.322	0.012	0.556^{***}	-13.255^{***}	0.329
	(0.088)	(0.717)	(0.106)	(0.131)	(0.355)	(0.130)	(0.146)	(4.039)	(0.332)
Special Bond Balance/GDP (t-1)	-0.159^{***}	-0.398	-0.229^{***}	-0.357^{***}	-0.041	-0.371^{***}	0.065	-2.137	0.131
	(0.058)	(0.491)	(0.073)	(0.108)	(0.421)	(0.107)	(0.107)	(2.410)	(0.193)
Fiscal Self-Sufficiency Rate (t-1)	0.125^{***}	0.509	0.096^{*}	0.106^{*}	-0.046	0.105^{*}	0.077	1.355^{*}	0.139^{**}
	(0.045)	(0.343)	(0.051)	(0.060)	(0.163)	(0.060)	(0.053)	(0.800)	(0.064)
Unutilized Debt Capacity(t-1)	0.053	-0.311	0.047	0.141^{**}	0.092	0.142^{**}	0.136^{*}	-0.136	-0.145
	(0.042)	(0.337)	(0.050)	(0.071)	(0.330)	(0.070)	(0.074)	(1.922)	(0.154)
Land Revenue/GDP (t-1)	0.243^{**}	3.095^{***}	0.237^{**}	0.040	1.527^{**}	0.019	0.363^{**}	-7.257^{***}	0.540^{***}
	(0.108)	(0.810)	(0.121)	(0.171)	(0.767)	(0.170)	(0.152)	(2.360)	(0.193)
LGFV Bond Balance/GDP (t-1)	0.012	-0.072	0.034	0.061	-0.034	0.068^{*}	-0.091^{***}	-1.278	-0.084
	(0.017)	(0.143)	(0.021)	(0.040)	(0.115)	(0.040)	(0.032)	(1.018)	(0.082)
GDP Growth Rate (t-1)	0.164^{*}	-0.472	0.172^{*}	0.246^{*}	-0.338	0.262^{*}	-0.026	-2.637	-0.273^{*}
	(0.085)	(0.635)	(0.094)	(0.139)	(0.649)	(0.139)	(0.105)	(1.744)	(0.140)
Tertiary Industry Ratio (t-1)	-0.002	-0.967^{*}	0.043	0.246^{**}	-0.168	0.250^{**}	-0.277^{**}	5.066	-0.249
	(0.070)	(0.544)	(0.081)	(0.098)	(0.413)	(0.098)	(0.132)	(3.146)	(0.253)
Population Growth Rate (t-1)	0.043	-0.622^{**}	0.029	0.013	-0.753^{***}	0.029	0.104^{*}	-1.564^{*}	0.063
	(0.035)	(0.259)	(0.038)	(0.050)	(0.252)	(0.050)	(0.056)	(0.898)	(0.072)
Housing Price-Income Ratio (t-1)	-1.505^{***}	-0.009	-1.677^{***}	-1.050^{***}	-0.461	-1.038^{***}	-2.229^{***}	3.472	-2.862^{***}
	(0.073)	(0.560)	(0.083)	(0.080)	(0.326)	(0.080)	(0.173)	(3.371)	(0.270)
Land Supply Population Ratio (t)			0.008^{*}			0.019^{**}			-0.002
			(0.005)			(0.007)			(0.006)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.292	0.032	0.314	0.248	0.035	0.255	0.366	0.130	0.485
Num. obs.	1448	1261	1260	898	982	897	581	394	394

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

6.1 Land Supply as a Transmission Channel

The results indicate that land supply serves as a significant transmission channel for several fiscal variables, but its function transforms dramatically between boom and adjustment periods. In the full sample, land fiscal dependency (land revenue to GDP ratio) exhibits the strongest mediation pattern: while maintaining a significant positive direct effect on housing price growth, it also shows a substantial positive effect on land supply. This suggests that localities more dependent on land finance strategically expand land supply, possibly to sustain the land-finance cycle by creating new development opportunities that generate future revenue.

General bond balance presents a contrasting pattern across market phases. In the full sample and adjustment period, higher general bond balance shows significant positive total effects on housing price growth. However, during adjustment periods, higher general bond balance demonstrates a strong negative relationship with land supply, while maintaining a positive though insignificant direct effect on housing prices. This suggests that areas with higher accumulated general bond debt may operate differently during market adjustments—as local governments with higher debt levels seek to stabilize their fiscal position, they simultaneously restrict land supply, potentially to prevent price collapse in oversupplied markets. This aligns with our earlier finding that general bonds have stronger positive effects in eastern regions and tier-1 cities, where land constraints are more binding and supply restriction more impactful.

Fiscal self-sufficiency exhibits an intriguing pattern during adjustment periods: while its total effect on housing price growth is not statistically significant, it shows both a significant positive effect on land supply and a significant positive direct effect on housing prices. This seemingly contradictory result suggests a suppression effect, where the indirect path through land supply and the direct effect operate in opposing directions, ultimately canceling each other out in the total effect. During market adjustments, fiscally self-sufficient localities appear to increase land supply (positive Fiscal→Supply coefficient), but increased land supply might exert downward pressure on prices. Simultaneously, these fiscally stronger localities implement direct market-supporting measures that positively affect housing prices (positive Direct Effect). This offsetting mechanism explains why fiscal self-sufficiency showed varied significance across our regional and city-tier analyses - its complex dual-pathway effect depends on local contextual factors that determine which mechanism dominates.

6.2 Reversed Transmission During Market Adjustment

A striking transformation occurs in the land supply channel during the adjustment period compared to the boom period. During boom times, both land fiscal dependency and previous housing price growth positively influence land supply, suggesting an expansionary cycle where appreciating markets and land-dependent fiscal structures drive further land release. This pattern reverses dramatically during adjustment periods, where land fiscal dependency, general bond balance, and population growth all exhibit strong negative relationships with land supply.

This reversal reveals a fundamental shift in local government land strategy: during booms, governments with higher land fiscal dependency capitalize on rising markets by expanding supply; during adjustments, localities with higher accumulated bond debt or greater land fiscal dependency strategically restrict land release to prevent price collapse. The negative relationship between population growth and land supply during adjustments further suggests that even high-demand areas implement supply restrictions during downturns, prioritizing price stability over accommodating demographic pressures.

6.3 Market-Dependent Direction of Land Supply Effects

The impact of land supply on housing prices itself exhibits market phase dependency. During boom periods, land supply demonstrates a positive effect on housing prices, suggesting that expanded supply signals continued development momentum that investors interpret positively. However, during adjustment periods, this relationship becomes negative though insignificant, reflecting the traditional supply-price dynamic where increased supply moderates prices in weakened markets.

This reversal helps explain some of the regional and tier-based variations observed earlier. The stronger fiscal-price relationships in eastern regions and tier-1 cities likely reflect not just their more developed institutional environments, but also their more sophisticated management of land supply as a policy instrument. The particularly strong effect of general bond balance in tier-1 cities aligns with these areas' greater capacity to strategically restrict land supply during adjustments, creating scarcity premiums that support price levels.

6.4 Conditional Direct Effects

The mediation analysis also reveals that many fiscal variables' direct effects on housing prices are conditional on market phase. Special bond balance exhibits a significant negative effect during boom periods but becomes insignificant during adjustments. Conversely, unutilized debt capacity shows significant positive effects during both boom and adjustment periods, though through different mechanisms. In boom periods, this effect operates directly with no significant mediation through land supply, suggesting market confidence effects; during adjustments, the mediation pathway becomes more complex with offsetting direct and indirect effects.

LGFV bond balance similarly demonstrates market-contingent effects: positive during booms but negative during adjustments, with no significant mediation through land supply in either phase. This reinforces our earlier finding that LGFV bond dependency varies by city tier, with the negative effect during adjustments particularly pronounced in smaller cities with weaker fiscal fundamentals. These findings illuminate the dynamic nature of China's fiscal-property nexus, where land supply functions not merely as a passive transmission channel but as an actively managed policy instrument that local governments calibrate according to market conditions. The effectiveness of fiscal variables in influencing housing markets depends not only on regional and city-tier characteristics, but also on the strategic deployment of land supply as both a revenue source and a market stabilization tool. This multidimensional relationship explains why identical fiscal measures produce heterogeneous outcomes across China's diverse urban landscape and varying market conditions.

7. Robustness check

To validate the reliability of our core findings, I conducted two alternative tests. First, Table 7 compares our dataset with the official National Bureau of Statistics 70-city housing price indices. Despite some numerical differences, both datasets capture similar market adjustment patterns: Tier 1 and Tier 4+ cities demonstrate greater resilience (the "barbell effect"), and Eastern regions experience larger corrections than Western regions. This consistency confirms that our data source reliably reflects the spatially differentiated characteristics of China's real estate market.

Table 7: Comparison of Housing Price Changes by City Tiers

	Peak to 2024 Change (%)		2022 to 2024 Change (%)		Num of cities	
City Category	Our data	Official data	Our data	Official data	Our data	Official data
By Tier						
Tier 1	-17.2	-12.8	-8.60	-9.35	4	4
New Tier 1	-25.8	-15.2	-19.00	-12.5	15	13
Tier 2	-26.6	-19.9	-20.40	-17.0	30	20
Tier 3	-22.1	-17.8	-14.80	-15.1	65	20
Tier 4 and Below	-15.1	-21.0	-7.42	-16.9	189	13
By Region						
Central	-19.9	-18.1	-12.50	-15.4	82	16
East	-25.2	-17.8	-16.70	-15.1	91	28
Northeast	-16.9	-24.3	-10.10	-19.6	33	8
West	-12.3	-16.4	-5.29	-12.9	97	18

Second, given the variation in housing price peak timing across cities, I used 2021 (rather than 2022) as the market phase demarcation point for robustness testing. The phase-specific regression results in Table 8 remain highly consistent with our primary analysis: general bond balance shows a significant positive correlation during the adjustment period (2021-2024), special bond balance exhibits a significant negative correlation during the boom period (2015-2020) but becomes insignificant during adjustment, and fiscal self-sufficiency ratio and land transfer revenue demonstrate significant positive correlations during the adjustment period. These results confirm the structural transformation in fiscal-housing price relationships across market phases.

To provide a comprehensive validation of our findings across different market phases, we conduct cross-sectional analyses for both boom (2017-2021) and bust (2021-2024) periods. Using predetermined fiscal variables to predict subsequent housing price performance.

Table 9 presents the comparative results across market phases. The findings reveal striking phase-dependent transformations in fiscal-housing relationships, strongly supporting our panel regression results. Several key patterns emerge:

General bond balance demonstrates consistently positive effects across both periods, but with dramatically different magnitudes. During the boom period, general bonds show a strong positive effect, while during the bust period, the effect becomes much smaller but remains significant. This suggests that general bonds serve as growth facilitators during expansions and stabilization tools during contractions, validating our "counter-cyclical transformation" hypothesis.

Land finance dependency shows persistent negative effects but with varying significance patterns. During the boom period, land revenue dependence demonstrates a marginally significant negative effect , while during the bust period, this effect becomes highly significant. This pattern indicates that land finance dependency creates structural vulnerabilities that become more pronounced during market stress.

Regional effects exhibit clear phase-dependent patterns. Eastern regions show significant positive effects during the boom period but neutral effects during the bust period, suggesting that regional advantages in market expansion do not translate to resilience during corrections.

The cross-sectional validation particularly strengthens the interpretation of our results by demonstrat-

Table 8: Robustness Check with Alternative Market Phase Demarcation (2021)

	Full Period	2015-2020	2021-2024
House Price Change Rate (t-1)	0.22^{***}	0.10^{***}	0.25^{***}
	(0.02)	(0.03)	(0.03)
General Bond Balance/GDP (t-1)	0.36^{***}	0.02	0.40^{***}
	(0.09)	(0.13)	(0.12)
Special Bond Balance/GDP (t-1)	-0.16^{***}	-0.36^{***}	0.12
	(0.06)	(0.11)	(0.08)
Fiscal Self-Sufficiency Rate (t-1)	0.13^{***}	0.11^{*}	0.13^{***}
	(0.05)	(0.06)	(0.05)
Unutilized Debt Capacity (t-1)	0.05	0.14^{**}	0.11^{**}
	(0.04)	(0.07)	(0.05)
Land Revenue/GDP (t-1)	0.24^{**}	0.04	0.29^{**}
	(0.11)	(0.17)	(0.11)
LGFV Bond Balance/GDP (t-1)	0.01	0.06	-0.03
	(0.02)	(0.04)	(0.02)
GDP Growth Rate (t-1)	0.16^{*}	0.25^{*}	0.11
	(0.09)	(0.14)	(0.07)
Tertiary Industry Ratio (t-1)	-0.00	0.25^{**}	-0.19^{*}
	(0.07)	(0.10)	(0.11)
Population Growth Rate (t-1)	0.04	0.01	0.06^{*}
	(0.04)	(0.05)	(0.04)
Housing Price-Income Ratio (t-1)	-1.51^{***}	-1.05^{***}	-1.67^{***}
	(0.07)	(0.08)	(0.13)
City Fixed Effects	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
R^2	0.29	0.25	0.30
Adjusted R^2	0.17	0.01	0.03
Observations	1448	898	780

Table 9: Cross-sectional Analysis: Boom vs. Bust Period Comparison

	Boom Period (2015.04-2021.09)	Bust Period (2021.09-2024.12)
General Bond Balance/GDP	2.193**	0.162*
	(1.025)	(0.088)
Special Bond Balance/GDP	-1.724	-0.021
	(1.430)	(0.112)
Fiscal Self-Sufficiency Rate	-0.506	-0.016
	(0.514)	(0.044)
Unutilized Debt Capacity	1.953*	-0.038
	(1.046)	(0.145)
Land Revenue/GDP	-4.649*	-0.718***
	(2.792)	(0.214)
LGFV Debt Balance/GDP	0.090	-0.019
	(0.372)	(0.030)
City Tier FE	Yes	Yes
Region FE	Yes	Yes
Economic Controls	Yes	Yes
Observations	168	256
R-squared	0.173	0.326
F-statistic	1.534	6.762

Note: Robust standard errors in parentheses. Economic controls include GDP growth rate, tertiary industry ratio, population growth, and housing price-income ratio. Boom period uses 2017 fiscal variables due to data availability.
* p < 0.1, ** p < 0.05, *** p < 0.01

ing that predetermined fiscal structures can effectively predict subsequent housing market performance across different phases. The contrasting coefficient magnitudes and significance patterns across boom and bust periods provide compelling evidence for the phase-dependent fiscal-property nexus identified in our panel analysis.

Fourth, the mediation analysis with alternative periodization in Table 10 further validates the functional transformation of land supply. During 2015-2020, land transfer revenue positively correlates with land supply , and land supply positively affects housing price growth; during 2021-2024, general bond and special bond balances show significant negative correlations with land supply, while land supply's effect on housing prices becomes negative though insignificant. This shift confirms the functional transformation of land supply across market phases: from an expansionary tool during boom periods to a price stabilization instrument during adjustments.

Collectively, these robustness checks strengthen our core findings, confirming that the impact of fiscal structures on housing price resilience undergoes a structural transformation across different market phases, regardless of specific data sources or periodization methods.

Table 10: Robustness Check Mediation with Alternative Market Phase Demarcation (2021)

	2015-2020			2021-2024		
	Total	Path A	Direct	Total	Path A	Direct
House Price Change Rate (t-1)	0.104^{***}	0.393^{***}	0.071^{**}	0.254^{***}	-0.356	0.178^{***}
	(0.030)	(0.150)	(0.036)	(0.035)	(0.501)	(0.043)
General Bond Balance/GDP (t-1)	0.024	0.432	-0.132	0.401^{***}	-4.043^{*}	0.136
	(0.131)	(0.369)	(0.163)	(0.117)	(2.159)	(0.186)
Special Bond Balance/GDP (t-1)	-0.357^{***}	-0.151	-0.454^{***}	0.118	-2.574^{*}	0.150
	(0.108)	(0.476)	(0.149)	(0.083)	(1.457)	(0.126)
Fiscal Self-Sufficiency Rate (t-1)	0.106^{*}	-0.064	0.105	0.125^{***}	0.000	0.150^{***}
	(0.060)	(0.165)	(0.079)	(0.047)	(0.638)	(0.055)
Unutilized Debt Capacity(t-1)	0.141^{**}	0.337	0.142	0.108^{**}	-1.141	0.031
	(0.071)	(0.363)	(0.100)	(0.052)	(0.841)	(0.072)
Land Revenue/GDP (t-1)	0.040	2.238^{***}	-0.037	0.292^{**}	-0.573	0.307^{**}
	(0.171)	(0.801)	(0.222)	(0.114)	(1.529)	(0.131)
LGFV Bond Balance/GDP (t-1)	0.061	0.027	0.046	-0.028	0.072	0.004
	(0.040)	(0.139)	(0.056)	(0.018)	(0.275)	(0.024)
GDP Growth Rate (t-1)	0.246^{*}	-0.457	0.429^{*}	0.107	-0.723	0.092
	(0.139)	(0.755)	(0.231)	(0.073)	(0.971)	(0.083)
Tertiary Industry Ratio (t-1)	0.246^{**}	-0.631	0.299^{**}	-0.193^{*}	-0.329	0.021
	(0.098)	(0.434)	(0.124)	(0.106)	(1.873)	(0.161)
Population Growth Rate (t-1)	0.013	-0.290	0.086	0.063^{*}	0.199	0.048
	(0.050)	(0.262)	(0.067)	(0.037)	(0.571)	(0.049)
Housing Price-Income Ratio (t-1)	-1.050^{***}	-0.406	-1.057^{***}	-1.674^{***}	3.955^{*}	-1.961^{***}
	(0.080)	(0.318)	(0.095)	(0.125)	(2.014)	(0.174)
Land Supply Population Ratio (t)			0.031^{***}			-0.004
			(0.010)			(0.004)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.248	0.040	0.272	0.297	0.042	0.305
Adj. R^2	0.011	-0.317	-0.037	0.032	-0.497	-0.089
Num. obs.	898	783	698	780	593	593

$^{***}p < 0.01; ^{**}p < 0.05; ^{*}p < 0.1$

8. Conclusion

This study makes significant contributions to understanding China's real estate market by systematically analyzing housing price resilience during the unprecedented post-2021 market adjustment. Through a comprehensive dataset covering 366 Chinese cities from 2015-2024, I examine the fiscal-property resilience nexus that reveals how local government fiscal structures fundamentally shape housing market outcomes.

Our research introduces several key innovations to the fiscal geography and urban development literature. First, I employ a granular decomposition of local government fiscal indicators that goes beyond the conventional aggregated analysis. By precisely differentiating between general bonds, special-purpose bonds, and LGFV debt, I identify distinct impact pathways of different debt types on housing markets. This fine-grained analysis reveals that these fiscal instruments operate through phase-dependent mechanisms—general bonds function as counter-cyclical stabilization tools during market corrections, while LGFV debt transforms from a growth catalyst to a fiscal burden that constrains intervention capacity.

Second, I identify a non-linear relationship between fiscal conditions and housing price resilience that produces a distinctive "barbell effect" across China's urban hierarchy. Both Tier 1 cities (with strong fiscal self-sufficiency) and Tier 4+ cities (with higher explicit debt financing) demonstrate greater price stability than mid-tier cities heavily dependent on implicit financing through LGFVs. This pattern challenges conventional assumptions about economic development and market stability, revealing that fiscal structure composition—not merely economic development level—determines a city's capacity to maintain housing price stability during downturns.

Third, I innovatively examine land supply as a mediating mechanism in the fiscal-property nexus, using land listing data to trace government behavior directly. Our mediation analysis uncovers a functional transformation of land supply from a growth-oriented revenue-generating tool during boom periods to a strategic market stabilization instrument during corrections. High land-finance dependent cities strategically restrict supply during downturns to maintain price levels, creating spatially differentiated patterns of housing market resilience.

Despite these contributions, our study has several limitations. The relatively short adjustment period (2022-2024) may not capture the full market correction cycle. Potential omitted variables at the city level could still influence both fiscal conditions and housing prices despite our methodological precautions. Additionally, our city-level aggregates may obscure important within-city spatial variations in housing price resilience.

Future research should explore how these fiscal-property relationships evolve over longer market cycles, potentially employing quasi-experimental designs to strengthen causal inference. Additional work is needed to understand how fiscal structures interact with demographic shifts, industrial transformation, and central-local fiscal relations to shape housing market outcomes. Intra-urban analyses could also reveal how fiscal pressures create spatially uneven development patterns within cities.

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