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# SUPPLY-SIDE RISKS IN LOCALIZED HOUSING MARKETS: EVIDENCE FROM APARTMENT DEVELOPMENT IN CHINA'S THIRD-TIER CITIES

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ABSTRACT

As China's urbanization enters a more localized and intensive phase, the real estate sector is increasingly facing unique structural challenges in lower-tier markets, where capacity is limited, and sales pressure is high. This research investigates the risk landscape of market competition, marketing, and sales in apartment development projects within China's third-tier cities to support strategic decision-making and project optimization. The study employs the Analytic Hierarchy Process (AHP) to analyze survey data from a panel of real estate experts, focusing on identifying critical risk factors across various development stages. The results show that the planning and sales stages receive relatively higher risk weights, indicating that early-stage market identification and subsequent sales performance are important components of the overall risk structure. Specifically, competition and market analysis and marketing appropriateness receive the highest composite weights, whereas broader macroeconomic factors do not dominate the overall risk structure. The findings suggest that accurate market positioning and effective marketing practices represent important risk-management priorities for apartment development projects in third-tier cities. These findings provide developers with an empirical basis for optimizing project positioning and sales strategies amid intense competition and limited market absorption.

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## 1. Introduction

After more than two decades of rapid expansion, China's urbanization process has entered its middle-to-late stages (Bro & Eriksen, 2025). The drivers of growth in new housing demand are gradually weakening, and the property market is progressively shifting from overall expansion to a new phase characterized by competition in the existing housing stock and structural adjustment (Han et al., 2021; Y. Wang et al., 2025). During this transition, the dynamics of the housing market are increasingly diverging across different tiers of cities (Su et al., 2024). Compared to first- and second-tier cities, housing markets in third-tier cities are typically characterized by limited market capacity, greater reliance on local demand, and more immediate pressure to absorb new supply, making the mismatch between new project supply and local demand particularly acute (Rogoff & Yang, 2024b). In this context, the risk structure of apartment development projects cannot be understood simply by applying the development logic of higher-tier cities. It is therefore necessary to re-examine the risk structure of apartment


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development projects and their primary sources within the specific context of third-tier cities (C.-F. Chen et al., 2025).

Existing research on real estate development risks has largely focused on factors such as land acquisition, financing arrangements, regulatory approvals, construction delays, and cost overruns, with the analytical focus primarily centered on the stages of supply formation and project implementation (Eliasson, 2025; Julca-Varas et al., 2025; Koirala & Shahi, 2024). By contrast, existing research still lacks a comprehensive explanation of how risks are redistributed across the development stage within lower-tier housing markets, or which factors play a dominant role before and after a project enters the market. Particularly in third-tier cities, where the local demand base is relatively fragile, substitutability among similar projects is stronger, and market absorption capacity is more limited, traditional development risk frameworks struggle to explain the actual sources of project risk adequately.

In light of these research gaps, this study focuses on the risk structure of apartment development projects in China's third-tier cities, examining two key questions: first, whether key risks remain predominantly concentrated in the traditional construction and implementation phases; and second, if this is not the case, which development stage and specific factors constitute the primary sources of project risk in the housing markets of third-tier cities. To this end, this study employs the Analytic Hierarchy Process (AHP). A risk assessment framework was developed based on a questionnaire administered to experts in property development and sales. Through two rounds of expert surveys, the evaluation indicators were identified and refined, ultimately forming an analytical system comprising four primary stages and eighteen secondary risk factors. Furthermore, by combining local weights with composite weights, this study identifies the core constraints within the overall project risk structure.

The research findings indicate that risks in apartment development projects in China's third-tier cities are primarily concentrated in the planning and sales stages, whereas the preparation and development stages are not the dominant sources in the overall risk structure. Among the secondary risk factors, those related to competition and market analysis, marketing adaptation, transport and accessibility, changes in demographics and the macroeconomic environment, and sluggish sales and delays rank highest. The results indicate that the risk focus of apartment development projects in third-tier cities has shifted significantly both upstream and downstream; the former manifests as identifying competition and market assessment during the planning stage, while the latter - as marketing adaptation and sales pressure during the sales stage.

The contributions of this study are primarily reflected in three aspects. Firstly, this study identifies the dominant sources of risk in apartment development projects in third-tier cities from the perspectives of stage distribution and factor ranking, thereby supplementing existing research on development risks regarding differences in risk structures. Second, this study redefines supply-side risks in housing development from the perspective of localized housing markets, noting that these risks involve not only constraints in the supply formation process but also the allocation efficiency of new supply and its capacity for market realization. Third, this study provides empirical insights into risk governance in third-tier city projects, indicating that risk management should extend beyond construction execution to include early-stage market identification and late-stage sales conversion.

## 2. Theoretical and Mechanism Analysis

### 2.1. Defining Supply-Side Risks in Localized Housing Markets

In housing development research, supply-side risks typically refer to constraints encountered during the formation and implementation of project supply, with the core issue being whether development activities can proceed according to the established plan (Shafaay et al., 2026). This definition primarily addresses implementation risks such as land acquisition, financing arrangements, approval progress, construction organization, and cost control in general development scenarios; however, it remains insufficient for apartment development projects in localized housing markets (Julca-Varas et al., 2025; Rogoff & Yang, 2024a). This is because the supply process in housing development does not end with the completion of a project but encompasses a continuous sequence of stages, ranging from the formation of supply and allocation decisions to the realization of sales (Deng et al., 2025).

In regional housing markets, even if new supply proceeds smoothly through the development and construction phases, risks may still emerge during the market absorption phase if product characteristics, pricing arrangements, marketing strategies, or sales pace are misaligned with local market conditions (Kang et al., 2024). Sales performance alone cannot directly determine whether a risk is supply-side or demand-side


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(Anenberg & Ringo, 2024). When household income, credit conditions, demographic changes, or home-buying preferences primarily influence sales by altering purchasing power and housing demand, the resulting changes in sales reflect shifts in demand-side conditions (Akgündüz et al., 2023). In contrast, when sales difficulties are linked to a mismatch between the positioning of existing products, supply allocation, pricing, or marketing arrangements and local market conditions, such issues are defined as sales realization risks (Cho et al., 2024). They are included within the scope of supply-side risk analysis.

At a deeper level, supply-side risks stem not only from external constraints encountered during resource allocation and project implementation, but also from the developers' insufficient ability to identify, adapt to, and respond to local market conditions (Ma et al., 2026). In the context of apartment development in third-tier cities, the effective realization of project supply depends, to some extent, on how closely it aligns with local demand structures, the competitive landscape, and purchasing power (Chen et al., 2025). Consequently, supply-side risks possess distinct process-oriented characteristics; they may manifest as land, capital, or approval constraints during the project formation stage, or as a mismatch between the supply proposal and market conditions during the subsequent sales stage (Akinwande & Hui, 2022; Huai et al., 2025).

Accordingly, this study defines supply-side risk as the structural constraints faced by apartment development projects during the apartment development from the initial supply decisions through to market delivery; risks associated with the sales stage are limited to those arising from mismatches between existing supply decisions and local market conditions (McAllister, 2025; Zheng et al., 2023). This definition extends project risk from narrowly defined construction implementation issues to the entire process in which the market tests supply outcomes. It provides a conceptual foundation for identifying the dominant sources of project risk in subsequent sections from the perspectives of stage distribution and factor weighting.

### 2.2. The Mechanism of Risk Formation in Apartment Development Projects in Third-Tier Cities

Real estate development is not merely a construction activity but a continuous process that progresses from preliminary decision-making and development implementation to market realization (Moorhead et al., 2021). Initial judgments regarding location, product, and target market are gradually embedded into land acquisition, financing arrangements, product design, and sales plans, giving the project's operations distinct sequential dependencies (Moorhead et al., 2022; Wang et al., 2025). Once judgment errors are embedded in specific development arrangements during a previous stage, it is usually difficult to make fundamental corrections in subsequent stages. Consequently, development risks may accumulate at critical junctures and persist throughout the project process (Meijer & Buitelaar, 2023). This sequential dependency implies that real estate development risks do not occur randomly across stages, but are continuously influenced by the quality of earlier decisions. Once location selection, product design, target customer segmentation, and pricing expectations have been translated into concrete development plans, subsequent adjustments often entail high costs (Liao, 2026). Even if the developer identifies earlier judgment errors at later stages, they may be constrained by land-use regulations, planning conditions, construction schedules, capital commitments, and sales cycles, making it difficult to implement timely, fundamental adjustments (Candel & Törnå, 2022). Consequently, early-stage decisions are not merely prerequisites for project initiation; they may also become a significant source of subsequent risk accumulation and exposure (Badawy et al., 2022).

In a market environment dominated by local demand and with limited supplementary external demand, errors in early judgment are usually difficult to absorb through subsequent demand expansion or market liquidity. Once such judgments are institutionalized into specific development pathways and resource allocation structures, the scope for subsequent correction through conventional development is relatively limited, making it easier for risks to accumulate continuously along the development chain (Meijer & Buitelaar, 2023). In other words, a localized housing market does not merely imply a smaller market scale; it also implies that deviations in early judgments entail higher adjustment costs and stronger subsequent transmission effects (Smith et al., 2026).

At the same time, apartment development projects in third-tier cities face more direct pressure from market scrutiny (Wei et al., 2020). As most buyers are local, demand for these projects is particularly sensitive to apartment types, prices, transport accessibility, the availability of supporting facilities, and marketing practices (Li et al., 2023). Certain deviations during the development process may not manifest immediately in


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construction but may emerge in concentrated form once the project enters the sales stage (Anenberg & Ringo, 2024). This indicates that the formation of project risks exhibits a certain degree of lag; while the sources of risk may originate in early-stage assessments and resource allocation, their manifestation may occur during subsequent market realization (Gabrovski & Ortego-Marti, 2025).

The risks associated with apartment development projects in third-tier cities are best understood as a process characterized by phased transmission and delayed exposure. Consequently, the phased differences in project risks are not merely a matter of process sequencing but are shaped by the continuous interplay between initial assessments, resource allocation, and market testing.

### 2.3. Theoretical Expectations Regarding the Phased Distribution of Risk

Real estate development risks exhibit distinct phases, closely related to the fixed location of real estate products, the intensity of capital investment, and the development cycle (Rachmawati & Kim, 2023). Unlike generally tradable commodities, once the land, planning, and product design of a real estate project have been finalized, subsequent development arrangements are typically subject to significant constraints (Phelps, 2025). Consequently, the significance of project risks depends on whether they exert a sustained influence on subsequent development processes and market outcomes (Moorhead et al., 2021). A phased perspective helps reveal the functional differences across development stages in risk formation and manifestation (Koc et al., 2023).

Viewed from the real estate development process, the planning stage primarily involves project feasibility assessments, market demand identification, product positioning and investment scheme design, serving to establish the fundamental direction of the project's supply (Gao et al., 2024; Moorhead et al., 2022); the preparation stage primarily involves securing land, approvals, partners and development conditions, which determines whether the project can proceed smoothly into the implementation phase (Jalali et al., 2022; Mathur & Gatdula, 2023; Meijer & Buitelaar, 2023); the development stage primarily encompasses project organization, cost control, schedule management and quality assurance, determining whether the project can be delivered according to the established plan (Ogheri et al., 2025); while the sales stage corresponds to the process of realizing value once the project enters the market, with sales performance, customer acceptance and capital recovery reflecting the project's market suitability (Chan et al., 2025; Nordahl & Sommervoll, 2023). Consequently, the various stages of the development process are not merely a simple chronological sequence, but correspond to different types of risk functions (Obike et al., 2025).

In apartment development projects, the distribution of risk across the stages is also influenced by the product's market positioning attributes. Apartment products typically rely more heavily on specific target demographics, purchasing power, transport links, and expectations regarding supporting facilities; their market acceptance depends not only on whether the project can be completed, but also on whether the pricing structure and sales approach can respond to the target market's needs (Lunke & Böcker, 2025). Focusing solely on implementation risks during the construction process may fail to explain instances in which market realization remains insufficient even after the project is completed (L. Li et al., 2023). Therefore, risk identification for apartment development projects must simultaneously address implementation constraints during development and the project's ability to realize value upon market entry (Lu et al., 2021).

Given the phased nature of property development, risk identification must go beyond a mere listing of general factors to focus on the functional roles of different development stages within the overall risk structure (Doomah & Jahmeerbacus, 2025). If project risks stem primarily from the construction process, then construction-related stages should carry greater weight within the overall risk structure; if risks arise more from the quality of early-stage decision-making and the ability to realize market value later on, then stages related to market assessment and sales realization may hold greater explanatory power (Baghalzadeh Shishehgarkhaneh et al., 2024; Zhang & Alhashedi, 2025). Conducting an analysis centered on the four stages of planning, preparation, development, and sales helps to reveal the relative roles of different development stages within the project's risk structure, and advances research on real estate development risks from a list of risk factors to the level of identifying stage-based structures (Fisher & Collins, 1999; Okudan et al., 2021).

### 2.4. Research Significance and Shortcomings of Existing Research

Based on the above analysis, the research value of apartment development projects in third-tier cities lies


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not in the particular nature of their development processes, but in the fact that they provide a concrete context for observing the restructuring of risk structures within localized housing markets. Given that the demand base, competitive landscape, and sales absorption capacity are all constrained by local conditions, traditional development risk frameworks may struggle to fully explain the actual manifestation of project risks in third-tier city markets (Theurillat, 2022). This necessitates examining apartment development projects in third-tier cities as relatively independent research subjects (Rogoff & Yang, 2024b).

Although existing research on real estate development risks provides an important foundation for understanding general constraints in project development, its analytical frameworks are largely based on general project management logic (Candel & Törnå, 2022). Such research helps explain the implementation obstacles that development projects may face as they progress. However, it still fails to adequately account for why risk structures exhibit phased differences in lower-tier housing markets.

More importantly, existing research often views development risks as a collection of independent risk factors and rarely analyzes the relationship between risk distributions across different phases from a holistic structural perspective. In the context of apartment development in third-tier cities, the significance of a risk factor depends on whether it exerts a sustained influence on project outcomes. Without a systematic identification of the risk structure, it is difficult to determine which factors truly constitute the core constraints of project risk governance.

Furthermore, existing discussions on supply-side risks pay little attention to the link between sales-stage risks and early-stage supply decisions. In third-tier housing markets, poor sales are not necessarily solely the result of insufficient demand; they may also reflect deviations in early-stage supply allocation, product design, and market judgment. If supply-side risks remain confined to the stages of supply formation and construction implementation, the role of the market realization phase within the development risk structure may be underestimated.

Consequently, further research should not merely focus on supplementing scattered risk factors, but must also identify the dominant sources of project risk from a holistic structural perspective. Following this logic, by integrating the multi-stage development process with multi-factor risk assessment into a single analytical framework, this study can thereby reveal the key constraints within the risk structure of apartment development projects in third-tier cities.

## 3. Methodology

### 3.1. Research Design

This study aims to identify the key risk factors in apartment development projects in third-tier Chinese cities at different stages of development and to measure their relative importance. Compared with general manufacturing or standardized investment projects, the risks associated with apartment development projects are distinctly multi-stage, multi-layered, and complex; there are not only functional differences between various risk factors, but also significant variations in their relative importance. Furthermore, risk factors such as market competition, marketing suitability, resident complaints, and sales conversion are often difficult to observe and compare directly using a single objective indicator. Therefore, this study adopts the AHP of Saaty (1987) as the primary research method to hierarchically identify and rank the risks associated with apartment development projects in third-tier cities.

The applicability of AHP is primarily reflected in two aspects. Firstly, AHP can decompose complex decision-making problems into a hierarchical structure comprising the objective, criterion, and indicator levels, thereby clarifying the logical relationships among different development stages and specific risk factors. Secondly, AHP can convert qualitative perceptions into comparable relative weights through expert judgment, making it suitable for addressing research subjects such as real estate development risks, which are characterized by both empirical and uncertain factors. Based on this, this study constructs a risk evaluation model for apartment development projects in third-tier cities using expert surveys and further identifies their dominant sources of risk.

### 3.2. Construction of the Indicator System and Design of the Hierarchical Structure

The evaluation indicator system in this study was not predetermined but gradually developed through a review of the literature, prior research, and preliminary expert surveys. Firstly, drawing on relevant research on real estate development risks, housing project management, and differences in urban market stratification, a preliminary identification of the primary risk factors in apartment development projects that may influence their success or failure was made. Secondly, through open-ended expert responses,


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individual interviews, and discussions, the initial indicators were screened, consolidated, and refined to enhance the indicator system's suitability and operability. Finally, a hierarchical model suitable for the risk assessment of apartment development projects in China's third-tier cities was established. The hierarchical model constructed in this study comprises three levels, as shown in Figure 1.

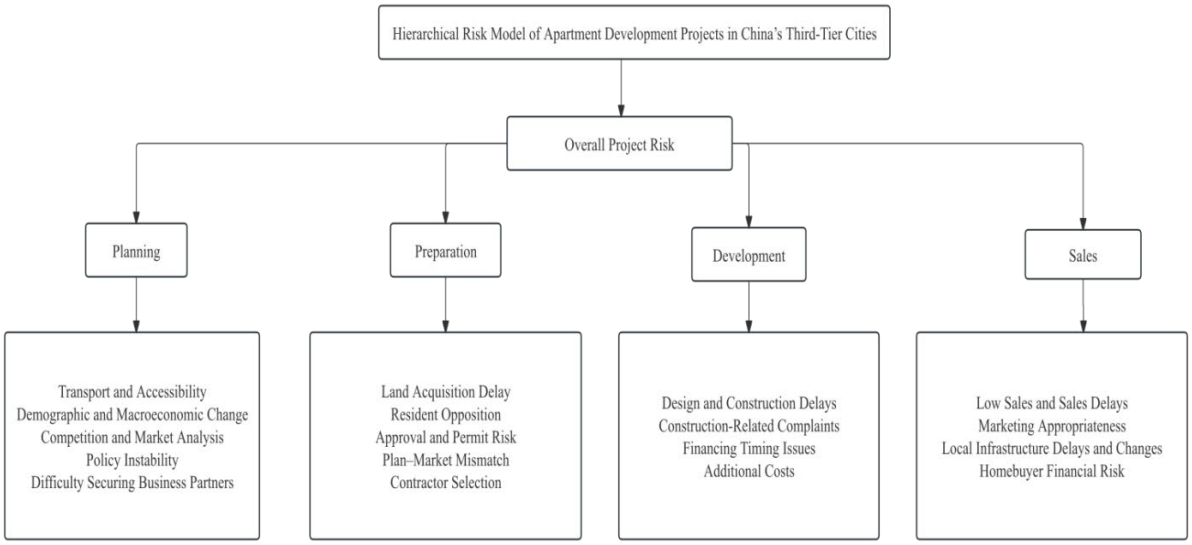


**Fig. 1.** Hierarchical risk model of apartment development projects in China's third-tier cities. *Source*: own study.

### 3.3. Expert Surveys and Data Collection

This study employed a two-round expert survey design. As shown in Table 1, the first round was a preliminary survey aimed at identifying and refining the evaluation indicators. A total of 13 experts with more than 10 years of practical experience in the development, construction, marketing, or sales of commercial apartments in China were invited to participate. These experts have experience with relevant projects in third-tier city markets, including Weihai in Shandong, Xiangyang in Hubei, Zunyi in Guizhou, and Lanzhou in Gansu. Through open-ended descriptions, individual interviews, and group discussions, the experts identified and elaborated on key risk factors that may arise during the apartment development process. On this basis, the study consolidated similar or duplicate factors to form the evaluation indicator system for the formal survey. Once the evaluation indicator system and the formal questionnaire had been finalized, the second round of the formal survey was conducted.

The second round constituted the formal survey. As shown in Table 2, an AHP comparative questionnaire was used to gather expert judgments. The formal questionnaire centered on four first-level categories and their associated specific risk factors, requiring experts to conduct pairwise comparisons of the relative importance of factors within each level. The number of comparisons required at each level varied according to the number of indicators: the primary level comprised four items, requiring six comparisons; a level containing five factors required ten comparisons; and a level containing four factors required six comparisons. The survey targeted professionals engaged in the development, construction, marketing, or sales of commercial apartments who also had relevant practical experience in the markets of the aforementioned third-tier cities; a total of 56 responses were collected.

**Table 1**

First Survey among Experts

| **Population** | **Experts in apartment development, construction, marketing, and sales in China** | |
|---|---|---|
| Geographic experience | Weihai, Xiangyang, Zunyi, and Lanzhou | |
| Experience | More than 10 years | |
| Gender | Men | 7 |
| | Women | 6 |
| | Total | 13 |
| Method | Open-ended writing and discussion | |


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| | |
|---|---|
| Purpose | Indicator identification and refinement |
| Duration | From Jul. 10, 2025 ~ Jul. 18, 2025 |

*Source*: own study.

**Table 2**

Second Survey among Experts

| **Population** | **Professionals in apartment development, construction, marketing, and sales in China** | |
|---|---|---|
| Geographic experience | Weihai, Xiangyang, Zunyi, and Lanzhou | |
| Gender | Men | 40 |
| | Women | 16 |
| | Total | 56 |
| Valid responses | 49 | |
| Method | Structured questionnaire | |
| Purpose | Risk weighting and consistency analysis | |
| Duration | From Jul. 19, 2025 ~ Jul. 30, 2025 | |

*Source*: own study.

The formal questionnaires were distributed to respondents via email and in person, and were collated and coded centrally upon return. For the returned questionnaires, this study first conducted a consistency check; for those with insufficient consistency, the researchers contacted the respondents to verify and correct the information, and questionnaires that still failed to meet the consistency requirements after re-verification were excluded. Ultimately, of the 56 completed questionnaires, 7 were excluded for invalid responses, leaving 49 valid questionnaires for subsequent AHP analysis, yielding a valid-response rate of 87.5%. All respondents ultimately selected had practical experience in various aspects of commercial apartment development, as well as relevant project or professional experience in the markets of the aforementioned third-tier cities.

### 3.4. AHP Analysis Procedure and Consistency Check

In the formal investigation, this study constructs a decision matrix using the AHP method to compare the relative importance of factors within the same level. The evaluation scale adopts the 1–9 scale proposed by Saaty (1990), where 1 indicates that two factors are equally important, 9 indicates that one factor is of extreme importance relative to the other, and 2, 4, 6, and 8 represent intermediate states between adjacent judgments. Using this scale system, experts' judgments on the relative importance of risk factors are converted into a computable matrix. For the 49 valid questionnaires ultimately retained, this study first constructed pairwise comparison judgment matrices for each respondent at the same level. Individual judgment matrices were screened for consistency during the questionnaire validation process. Subsequently, this study used the geometric mean method to aggregate the judgment values from the 49 experts for each factor pair, thereby forming a group-level judgment matrix. Specifically, for the comparison between factor (i) and factor (j), the group judgment value was obtained as the geometric mean of the corresponding judgment values from the 49 experts. This method preserves the reciprocity property of the AHP pairwise comparison matrix while integrating individual expert judgments into a unified group judgment.

After obtaining the aggregated group judgment matrix, the local weights of the factors at each level are calculated to identify the relative importance of different development stages and their corresponding risk factors. The consistency of the aggregated group judgment matrix is then assessed using the Consistency Index (CI) and the Consistency Ratio (CR) (Ishizaka & Labib, 2011), which are calculated as follows:

$$CI = \frac{\lambda_{max} - n}{n-1} \quad (1)$$

$$CR = \frac{CI}{RI} \quad (2)$$

where $\lambda_{\max}$ denotes the maximum eigenvalue of the judgment matrix, $n$ denotes the order of the judgment matrix, and $RI$ denotes the random consistency index. It is generally accepted that when $CR < 0.10$, the judgment matrix exhibits acceptable consistency; if $CR \geq 0.10$, the consistency of the matrix requires further examination.

Once the local weights have been calculated, this study combines the layer-specific weights to derive a composite weight and uses it to rank the 18 risk factors overall. Specifically, the composite weight of each secondary risk factor is calculated by multiplying the


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unrounded primary weight for its respective stage by the corresponding unrounded local weight. The composite weight reflects both the relative importance of a given risk factor within its respective stage and the significance of that stage within the overall project risk structure; it is therefore better suited to identifying the dominant sources of risk in apartment development projects in third-tier cities.

## 4. Empirical Results

### 4.1. Stage-Level Risk Weights

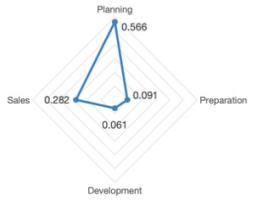
This section reports the first-level stage weights for the risks associated with apartment development projects in China's third-tier cities. All results are based on the 49 valid questionnaires retained following consistency checks.

The first-level stage weights (Table 3) indicate significant differences among the four development stages. The planning stage had the highest weight at 0.566; the sales stage followed at 0.282, while the preparation and development stages had weights of only 0.091 and 0.061, respectively. The consistency ratio (CR) of the first-level stage judgment matrix was 0.060, which falls within an acceptable range, indicating that the experts' judgments possess good internal consistency.

**Table 3**

Relative Importance Weights of the Main Categories

| Project | Importance | Consistency |
|---|---|---|
| Planning | 0.566 | 0.060 |
| Preparation | 0.091 | |
| Development | 0.061 | |
| Sales | 0.282 | |



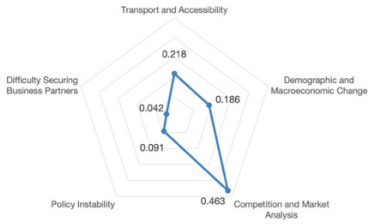

*Source*: own study.

In terms of stage distribution, the planning and sales stages received higher weights than the preparation and development stages, suggesting that project risks are more concentrated in the early stages of supply allocation and subsequent market realization. Regarding the first-level stage weights, the overall risk structure of apartment development projects in third-tier cities is more clearly shaped by market-related constraints, whereas the preparation and development stages are not dominant risk sources.

**Table 4**

Importance Weights in the Planning Stage

| Project | Importance | Consistency |
|---|---|---|
| Transport and Accessibility | 0.218 | 0.055 |
| Demographic and Macroeconomic Change | 0.186 | |
| Competition and Market Analysis | 0.463 | |
| Policy Instability | 0.091 | |
| Difficulty Securing Business Partners | 0.042 | |




*Source*: own study.

### 4.2. Local Weights of Risk Factors by Development Stage

#### 4.2.1. Analysis of the Planning Stage

The planning stage comprises five specific risk factors, as shown in Table 4: transport and accessibility risks; demographic and macroeconomic environment risks; competition and market analysis risks; policy instability risks; and partner shortage risks.The results of the specific weighting analysis indicate that competition and market analysis risks carry the highest weighting (0.463). This indicates that in apartment development projects in third-tier cities, identifying competition and conducting market assessment during the early stages constitutes the most prominent source of risk in the planning stage. Risks related to transport and accessibility (0.218) and changes in the demographic and macroeconomic environment (0.186) rank second and third, respectively, suggesting that location conditions and the demand base remain significant constraints that cannot be overlooked during the planning stage (Chiang, 2019). The former determines whether a project falls within the scope of local effective demand, while the latter reflects the greater sensitivity of third-tier city markets to changes in population mobility, income expectations, and local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economic conditions. By comparison, policy instability risks (0.091) and partner shortage risks (0.042), although still part of the planning stage, do not constitute dominant factors in the risk ranking for this stage.

From the perspective of the local weighting structure, the core of the planning stage lies not in whether the project meets the conditions for implementation, but in whether the developer can conduct effective competitive analysis, location assessment, and demand evaluation before entering the market (Zhang & Miller, 2025). This result further explains why the planning stage occupies a dominant position in the first-level stage weightings.

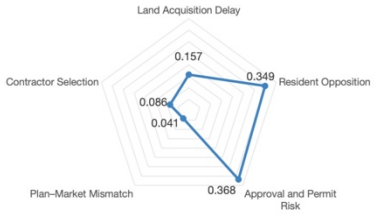
### 4.2.2. Analysis of the Preparation Stage

As shown in Table 5, the ranking of local weights for the preparation stage indicates that risks in this stage are primarily concentrated in approval and licensing risks and public opposition risks. Among these, approval and licensing risks carry the highest weight (0.368), followed by public opposition risks (0.349). This result suggests that the main constraints during the preparation stage are more closely related to institutional procedures and local coordination issues prior to project implementation (He et al., 2025).

**Table 5**

Importance Weights in the Preparation Stage

| Project | Importance | Consistency |
|---|---|---|
| Land Acquisition Delay | 0.157 | 0.033 |
| Resident Opposition | 0.349 | |
| Approval and Permit Risk | 0.368 | |
| Plan–Market Mismatch | 0.041 | |
| Contractor Selection | 0.086 | |




*Source*: own study.

The fact that approval and licensing risks rank first indicates that the approval process and the acquisition of necessary development permits are key prerequisites for a project to progress from planning to implementation. Such risks are closely linked to the timing of project commencement and the certainty of early-stage progress (Gallagher et al., 2025). The risk of local opposition follows closely behind, further illustrating that the preparation stage is not merely a procedural preparation process, but also involves coordination between the project and the local social environment. In third-tier cities, where local constraints are stronger, the degree of residents' acceptance of development plans often influences the costs of preliminary coordination and the efficiency of project progress.

In comparison, while the risk of delays in land acquisition (0.157) is of some significance, its impact remains lower than that of approval and licensing factors and social coordination; the risk associated with the selection of construction contractors (0.086) and the risk of planning-market mismatch (0.041) are more typically secondary constraints.

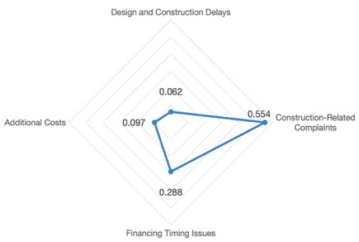
### 4.2.3. Analysis of the Development Stage

Compared with the planning and preparation stages, the risks in the development stage (as shown in Table 6) do not exhibit the same degree of dominance; rather, they manifest as practical constraints during project implementation. The CR value for the decision matrix in this stage is 0.025, indicating it meets the criterion for internal consistency.

**Table 6**

Importance Weights in the Development Stage

| Project | Importance | Consistency |
|---|---|---|
| Design and Construction Delays | 0.062 | 0.025 |
| Construction-Related Complaints | 0.554 | |
| Financing Timing Issues | 0.288 | |
| Additional Costs | 0.097 | |




*Source*: own study.

According to the local weighting analysis, the risk of construction complaints carries the highest weight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(0.554), indicating that once the project enters the implementation phase, coordination between construction activities and the surrounding social environment is more likely to pose a significant risk. This result suggests that the key constraint during the development stage lies not solely in whether engineering works can be carried out smoothly, but rather in whether construction activities can be sustained within the local social environment. Financing timing risk ranks second (0.288), further illustrating that another significant constraint in the development stage stems from the degree of alignment between funding arrangements and project progress. Even if the project has completed preliminary planning and preparatory procedures, a misalignment between the pace of fund disbursement and the demands of construction progress may still directly affect the efficiency of project implementation (Dabirian et al., 2021). In comparison, the weights for cost overruns (0.097) and design and construction delays (0.062) are relatively low, indicating that experts do not regard technical issues during implementation as the most prominent sources of risk in the development stage.

Overall, risks in the development stage are more concentrated in the two constraints of social coordination and funding alignment than they are a dominant source within the overall risk structure. This is also consistent with the weighting results for the primary stage discussed earlier, namely that the core risks of apartment development projects in third-tier cities are primarily concentrated in market identification and sales realization, while non-dominant constraints at the implementation level more characterize the development stage.

#### 4.2.4. Analysis of the Sales Stage

Similarly, among the four risk factors for the sales stage listed in Table 7, marketing alignment risk (0.548) is significantly higher than the other factors. This indicates that the most prominent source of risk during the sales stage is the degree of alignment among marketing methods, promotional strategies, and the target customer base. If marketing strategies fail to respond effectively to local demand structures and home-buying preferences, related constraints are more likely to manifest during the sales conversion process (Guarini et al., 2025).

The risk of sluggish sales and delays ranks second (0.298). This further indicates that the market's absorption capacity remains the core challenge of the sales stage. In third-tier city projects, the pace of sales is directly linked to capital recovery and return realization. According to the internal logic of the stage, marketing alignment risk refers to issues with the alignment between the sales organization and promotional activities, while the risk of sluggish sales and delays concerns whether the project can successfully achieve market conversion (Selvi et al., 2020). Together, these two factors constitute the core of the risk structure in the sales stage.

Consequently, the primary focus of risk in the sales stage clearly lies on these two factors: marketing alignment and sales realization. This also explains why this stage ranks second in the overall risk structure.

### 4.3. Analysis of Composite Weights and Overall Ranking

As shown in Table 8, among the 18 risk factors for apartment development projects in third-tier cities, the composite weight rankings are as follows: competition and market analysis risk (0.262), marketing suitability risk (0.154), transport and accessibility risk (0.123), demographic and macroeconomic environment risk (0.105), and sales slump and delay risk (0.084) rank at the top, constituting the core of the overall risk structure. Among these, three of the top five factors relate to the planning stage and two to the sales stage, highlighting the key stages where dominant risks arise.

**Table 7**

Importance Weights in the Sales Stage

| Project | Importance | Consistency |
|---|---|---|
| Low Sales and Sales Delays | 0.298 | 0.040 |
| Marketing Appropriateness | 0.548 | |
| Local Infrastructure Delays and Changes | 0.088 | |
| Homebuyer Financial Risk | 0.067 | |

*Source*: own study.

**Table 8**


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Overall Composite Importance Weights

| Main Category | Subcategory | Composite Importance | Order |
|---|---|---|---|
| Planning | Transport and Accessibility | 0.123 | 3 |
| | Demographic and Macroeconomic Change | 0.105 | 4 |
| | Competition and Market Analysis | 0.262 | 1 |
| | Policy Instability | 0.051 | 6 |
| | Difficulty Securing Business Partners | 0.024 | 11 |
| Preparation | Land Acquisition Delay | 0.014 | 14 |
| | Resident Opposition | 0.032 | 9 |
| | Approval and Permit Risk | 0.033 | 8 |
| | Plan–Market Mismatch | 0.004 | 18 |
| | Contractor Selection | 0.008 | 15 |
| Development | Design and Construction Delays | 0.004 | 17 |
| | Construction-Related Complaints | 0.034 | 7 |
| | Financing Timing Issues | 0.018 | 13 |
| | Additional Costs | 0.006 | 16 |
| Sales | Low Sales and Sales Delays | 0.084 | 5 |
| | Marketing Appropriateness | 0.154 | 2 |
| | Local Infrastructure Delays and Changes | 0.025 | 10 |
| | Homebuyer Financial Risk | 0.019 | 12 |

*Source*: own study.

This ranking pattern suggests that the overall risk structure of apartment development projects in third-tier cities is more prominently characterized by constraints in the two areas of supply allocation and market conversion. The fact that transport and accessibility risks, as well as risks associated with demographic and macroeconomic changes, also rank highly further indicates that the dominant risks are not merely narrowly defined sales issues but rather comprehensive market alignment issues rooted in location conditions, demand fundamentals, and the competitive landscape.

By contrast, most factors in the preparation and development stages rank lower in the overall hierarchy. This suggests that while procedural advancement, construction implementation, and cost control constitute necessary conditions for project operation, they do not play a dominant role in the overall risk structure. The results of the comprehensive weighting analysis indicate that risks in apartment development projects in third-tier cities are more concentrated in factors related to market identification and market realization, whereas the construction process itself is not the dominant source in the overall risk structure. Figure 2 clearly illustrates that overall risk is not evenly distributed across the development process but is primarily driven by a small number of high-weighting factors, most of which are concentrated in the planning and sales stages.

## 5. Conclusions and Implications

### 5.1. Conclusions

Based on survey data from real estate experts, this study employs the Analytic Hierarchy Process (AHP) to identify and rank the relative importance of risks associated with apartment development projects in China's third-tier cities. The results of the expert evaluations indicate that, compared with the preparation and development stages, the risks associated with the planning and sales stages were assigned higher relative importance. This suggests that, in the judgment of the surveyed experts, the primary constraints in the project development process are not concentrated in the construction implementation phase, but are more evident in the critical market-related stages at the front and back ends of the development process. Further analysis of local and composite weights reveals that factors such as competition and market assessment, marketing alignment, identification of location and demand fundamentals, and sales conversion constitute significant components of the overall risk structure, with competition-related risks and marketing alignment risks being particularly prominent. Overall, the expert evaluation results indicate that the most significant risks in apartment development in third-tier cities are largely related to structural constraints stemming from mismatches between project supply


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decisions and local market conditions.

### 5.2. Discussions

The findings of this study indicate that the risks associated with apartment development projects in China's third-tier cities do not primarily manifest as technical constraints during the construction process, but rather center on whether the project's supply can be accurately identified and positioned prior to market entry, and effectively promoted and absorbed once it enters the market.

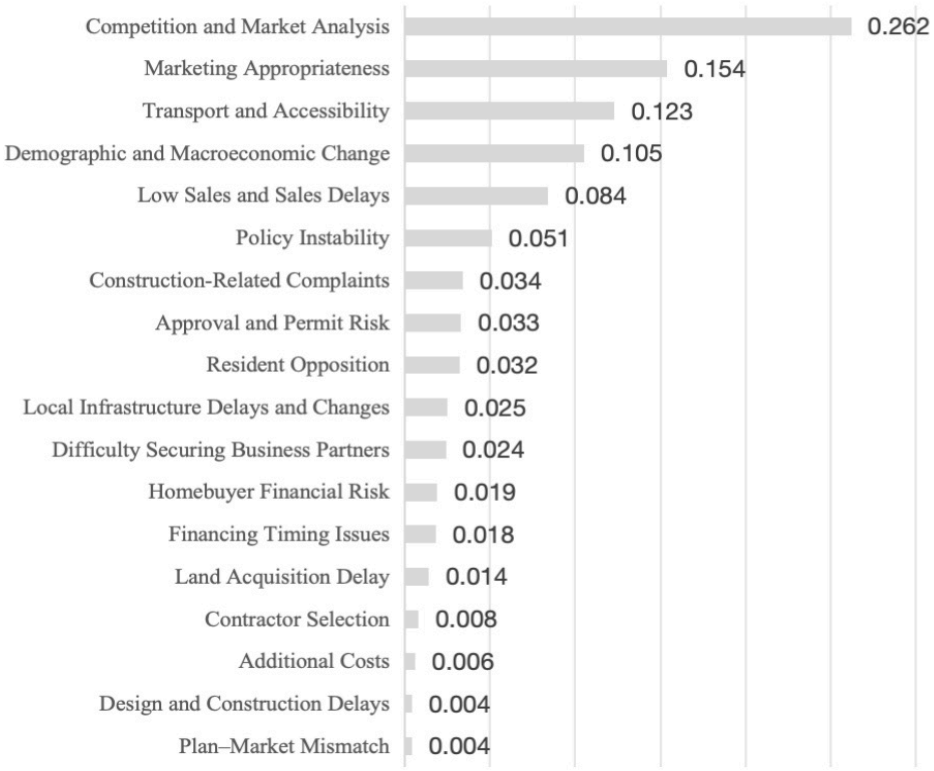


**Figure 2.** Composite Weight Ranking of Risk Factors

This risk structure can be understood through the lens of decision-lock-in and market-testing mechanisms in localized housing markets (Jalali et al., 2022; Phelps, 2025). Compared to higher-tier cities, housing markets in third-tier cities have more limited capacity, rely more on local demand, and exhibit greater substitutability among similar projects within the region (Rogoff & Yang, 2024b). In this context, once deviations occur in early-stage competitive analysis, location assessment or demand evaluation, it is often more difficult for projects to correct these through subsequent development processes; when there is a mismatch between the marketing organization, sales timing and the target customer base, these initial deviations may translate into sales pressure, underperformance in the market and constraints on capital recovery (L. Li et al., 2023; Zhang & Miller, 2025). Consequently, the significance of the planning and sales stages within the overall risk structure can be understood as a concentrated reflection of how local market conditions shape the distribution of project risks.

Another key finding of this study extends the understanding of supply-side risks. Existing research on real estate development risks generally interprets supply-side risks as constraints that arise during supply formation and project implementation (Akinwande & Hui, 2022). However, this study finds that in apartment development projects in third-tier cities, supply-side risks are also manifested through sales realization efficiency and market absorption capacity during the sales stage. In other words, sales risks are not entirely the result of fluctuations on the demand side; they may also be a delayed reflection of early-stage supply decisions, product positioning, and marketing organization that fails to adapt to local market conditions (Chiang, 2019; Selvi et al., 2020).

This finding is consistent with theoretical assessments regarding the phased distribution of risk (Koc et al., 2023); however, its greater significance lies


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in revealing structural differences in apartment development risks within third-tier cities. Project risks are determined not only by the construction and implementation phases but also by the quality of market judgment, the suitability of supply strategies, and sales execution capabilities (Rachmawati & Kim, 2023; Z. Wang et al., 2025). Consequently, this study extends the study of real estate development risks from general project implementation constraints to the level of identifying risk structures within localized housing markets.

### 5.3. Implications

The risk structure identified in this study suggests that the primary constraints on apartment development projects in third-tier cities manifest more as risks related to the continuity between supply allocation and market absorption. This finding offers valuable insights for project management, corporate risk governance, and local housing supply policies. At the project management level, apartment development projects in third-tier cities should prioritize market suitability assessments during project approval and planning. During the project initiation and planning stages, project management should not focus solely on the feasibility of the development process but should also strengthen ex-ante assessments of market viability and sales realization pathways. Before substantive development commences, developers need to conduct systematic evaluations of the competitive landscape, customer affordability, product positioning, and sales implementation strategies to mitigate the risk of market misalignment only becoming apparent after the project is completed. This approach reduces the risk of discovering positioning discrepancies or sales barriers only after completion, while also shifting risk control from reactive measures to proactive identification.

At the corporate risk governance level, developers must transition project risk management from a singular focus on engineering management to cross-stage, cross-departmental collaborative governance. Risks in apartment development projects in third-tier cities are often not merely issues of localized efficiency in a specific construction phase, but rather the result of ineffective coordination among market research, product design, financing arrangements, construction, and sales management. Consequently, enterprises should establish information-sharing and feedback mechanisms spanning the entire project lifecycle, enabling the marketing, design, finance, engineering, and sales departments to reach a consensus in the early stages of a project and to refine risk expectations as the project progresses. In particular, sales data, customer feedback, and market reactions should not be treated merely as internal information for the sales department; rather, they should be incorporated into the enterprise-level risk monitoring system to facilitate timely adjustments to pricing strategies, marketing resource allocation, and capital recovery arrangements.

At the local housing supply policy level, the risks associated with housing development in third-tier cities need to be managed by assessing whether the local market can effectively absorb new supply. Local policy arrangements should not focus solely on the number of projects under construction, development progress, or short-term investment stimulation; greater emphasis should be placed on coordinating the pace of housing supply with local demographic changes, the structure of purchasing power, inventory levels, and market absorption capacity. In markets with limited local demand and intense competition among similar projects, an excessive concentration of new supply in the short term may exacerbate sales pressure, inventory accumulation, and capital recovery risks. Therefore, local housing supply policies should strengthen dynamic monitoring of regional demand, project inventory, sales cycles, and the concentration of similar products. By reasonably scheduling land supply, optimizing project approval guidance, and improving early-warning mechanisms in the market, structural risks arising from supply mismatches can be mitigated.

### 5.4. Shortcomings and Perspectives

Although this study has identified the primary sources of risk in apartment development projects in China's third-tier cities from the perspectives of stage distribution and factor weighting, the study nevertheless has certain limitations. Firstly, this study employs expert questionnaires and the Analytic Hierarchy Process (AHP) for analysis. This method enables a structured comparison of the relative importance of different risk factors under multi-stage, multi-factor conditions and helps identify risk structures and their priorities; however, its analysis focuses primarily on the relative weights of risk factors and cannot further reveal the dynamic transmission relationships formed among different risk factors during the project's progression. Future research could incorporate project lifecycle data or adopt a longitudinal study design further to analyze interactions among different risks and their evolution. In this regard, expert judgments may also reflect certain


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characteristics of the prevailing market context. This survey was conducted during a period of ongoing adjustment in China's real estate market; therefore, the relative importance of certain risk factors may have been influenced by market conditions at the time. Consequently, the weights obtained in this study primarily reflect the experts' relative assessments of different risk factors during the survey period. In the future, the stability of risk rankings under different real estate market conditions could be further examined through repeated surveys conducted during different market phases or by combining data from longer-term projects and market trends.

Moreover, as this study focuses on apartment development projects in China's third-tier cities, its conclusions are, to some extent, context-dependent, varying by urban tier and product type. Housing markets in third-tier cities are typically subject to stronger local demand constraints and market absorption pressures; therefore, the conclusions drawn here are more applicable to apartment development scenarios within lower-tier, localized housing markets. Whether the risk structure exhibits the same characteristics in first- and second-tier cities, or across different product types such as ordinary residential properties, commercial real estate, and social housing, remains to be further examined. Furthermore, differences exist across regions in economic foundations, population mobility, land supply systems, and real estate regulatory policies; these market and institutional conditions may also influence the ranking of risk factors.

Future research could build upon this study by advancing in three directions: data, context, and mechanisms. At the data level, subsequent research could integrate project-level, corporate operational, and market transaction data to test further the key risk factors identified in this study. Indicators such as sales cycles, inventory levels, price adjustments, capital recovery rates, and project profitability can be used to analyze how initial market assessments, product positioning, and marketing strategies influence subsequent sales outcomes, thereby supplementing expert judgments with more verifiable empirical evidence.

At the research context level, future research could conduct comparative analyses across different urban tiers and regional markets. By comparing apartment development projects in first-, second-, and third-tier cities and across different regions, it will be possible to determine whether the risk structure identified in this study differs across urban tiers and across regions. In particular, within urban agglomerations where demand fundamentals, population mobility, and market absorption capacity vary significantly, comparative studies will help further reveal the differentiated manifestations of real estate development risks across local markets.

At the mechanistic level, future research could focus on the dynamic relationships between risk factors. While this study primarily identifies the relative importance of risk factors, future studies could incorporate project lifecycle data, case tracking, or longitudinal research designs to analyze how initial market-judgment errors are propagated through the stages of product configuration, marketing organization, sales realization, and capital recovery. By introducing a dynamic analytical framework, future research could provide a more in-depth explanation of the formation process of supply-side risks in localized housing markets and the pathways for their governance.

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