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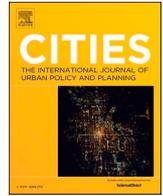
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Secondary cities as an optimal place to settle down in China? The role of housing, employment and amenities in recent migrants' leaving intention across the urban hierarchy

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ABSTRACT

Urbanization trends in China reveal a shift in migration patterns, with an increasing number of recent migrants leaving primate cities while secondary cities emerge as attractive destinations. Given China's aging population and intensifying intercity competition for migrants, understanding the factors associated with recent migrants' intentions to leave cities at various levels becomes increasingly important. While spatial equilibrium theory implies that migrants' leaving intentions are shaped by the balance of housing, employment, and amenities, these factors vary hierarchically across city levels. This study examines how these factors differentially shape recent migrants' leaving intentions across primate, secondary, and small cities. Through binary logistic regression of national survey data, we find that recent migrants in secondary cities exhibit lower leaving intentions compared to those in primate and small cities. Further interaction analyses reveal distinct patterns: in primate cities, medium-income migrants are most likely to consider leaving; in secondary cities, rental housing status and hometown residential land ownership more strongly increase leaving intentions compared to primate cities, while medical resource accessibility more significantly reduces leaving intentions compared to small cities. Drawing on spatial equilibrium theory, our analysis suggests that secondary cities appear to achieve an optimal balance: their greater homeownership opportunities serve as a compensatory factor for their lower incomes compared to primate cities, while their superior medical amenity accessibility compensates for their higher housing costs compared to small cities. This paper contributes theoretically by bridging factors in spatial equilibrium theory with the urban hierarchy dynamics proposed by differential urbanization theory. It also offers practical insights for tailoring migration retention policies across city levels and adapting to the transformation of urbanization stages.

1. Introduction

The urbanization process unfolds through alternating phases of concentration and deconcentration of population (Geyer & Kontuly, 1993). According to differential urbanization theory, the early stages typically witness population concentration in the largest primate cities, driven by agglomeration economies (Geyer & Kontuly, 1993). However, as primate cities experience rising land prices and declining quality of life, population flows begin to shift toward secondary cities that occupy subordinate but significant positions in the urban hierarchy.

China exemplifies this transition. Drawing on differential urbanization theory, Wen, Jansen, van der Heijden, and Boelhouwer (2025)

classify primate cities as China's four established first-tier cities, secondary cities as the group of "new first-tier cities," and the remaining cities as small cities. Their findings indicate that China's current urbanization is characterized by slowing migration concentration in primate cities, increasing migration toward secondary cities, and continued population loss in small cities. Notably, Shanghai, one of the primate cities, experienced a decline in its resident population in 2015, a shift not seen in the previous four decades. This phenomenon reflects both decreased migration to primate cities and a growing trend of "escaping from primate cities" (Jin, Li, Jansen, Boumeester, & Boelhouwer, 2022; Wu, Zhou, Wei, & Yang, 2019).

The desire to leave primate cities stems from factors such as high

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housing prices (Chen, Hu, & Lin, 2019), which appear to exert a particularly significant influence on migrant populations (Liu, Peng, & Cao, 2023). Research by Wen et al. (2025) indicates that over 96% of outflow from primate cities are onward migrants, suggesting that it is predominantly migrants, rather than locals, who move away from these cities. This trend may be due to migrants' vulnerability to employment instability and housing costs pressures, particularly among those who have settled in the city for less than five years (Kogan, 2006; Li, Gao, Xiaomei, Yimin, & Li, 2024). These recent migrants face disadvantages in local labor markets due to lower returns on work experience and often require time to establish social networks (Kogan, 2006). Understanding these individuals' leaving intentions is crucial not only for cities facing demographic challenges of population decline, but also for interpreting the broader transition from concentration to deconcentration in urbanization.

Recent migrants' leaving intentions in this transitional stage of urbanization can be interpreted through the spatial equilibrium theory developed by Roback (1982). This theory assumes that utility is equalized across space. Utility, in this context, refers to the perceived satisfaction or benefits individuals obtain from living in a particular place. When utility becomes unbalanced across locations, individuals tend to move in order to restore equilibrium (Glaeser & Gottlieb, 2009). The recent trend of migrants leaving primate cities can therefore be understood as a response either to declining utility in primate cities or to rising utility in other cities.

According to spatial equilibrium theory, utility is determined by three primary factors: housing costs, income, and amenities (Roback, 1982). In China's current stage of urbanization, which remains dominated by concentration (Wen et al., 2025), primate cities have benefited from agglomeration economies, leading to more developed economies, higher-income job opportunities, and superior amenities supported by larger populations (Chan & Zhao, 2002). However, these advantages come with faster increases in housing prices in primate cities compared to secondary and small cities (Chen et al., 2019). Consequently, primate cities exhibit high income, diverse amenities, and high housing costs, while small cities have the lowest levels across the three components and secondary cities occupy an intermediate position, as shown in Table 1. The balance among these factors shapes the utility individuals perceive at different city levels and influences recent migrants' intentions to leave across the urban hierarchy.

Recent research has examined the relationship between city size and migrants' leaving intentions, yielding mixed findings (Dang, Chen, & Dong, 2019; Liu & Wang, 2020; Song, Zhu, & Luo, 2022). While some studies indicate that migrants in larger cities demonstrate stronger intention to stay (Dang et al., 2019; Liu & Wang, 2020), others have identified an inverse U-shaped relationship between city size and intention to stay, suggesting that middle-ranked cities may be more attractive for migrants to settle (Song et al., 2022). However, it remains understudied whether the factors related to migrants' intentions to leave differ across various levels of cities.

Therefore, the current research seeks to address the following

questions: 1) Is recent migrants' intention to leave associated with the factors of housing, employment, and access to amenities in the host city? 2) Is recent migrants' intention to leave associated with the host city's level in the urban hierarchy? 3) Does the relationship between migrants' intention to leave and their housing, employment, and access to amenities differ across different levels of cities?

This paper aims to examine the differential role of housing, employment, and amenities on recent migrants' intentions to leave across the urban hierarchy. The findings offer important empirical insights. In China's competitive urban landscape, understanding migrants' leaving intentions is crucial for designing timely retention strategies. For example, Hangzhou, a secondary city, has successfully attracted talent from primate cities such as Shanghai and Beijing (Ren, 2022), partly by implementing targeted housing policies. Recent migrants are generally more mobile and less socially embedded, which makes them particularly sensitive to utility imbalances—for example, when high housing costs are not offset by adequate income or local amenities. Their leaving intentions can therefore serve as early signals of such mismatches, allowing policymakers to tailor housing and industrial policies across city levels. Moreover, while existing studies on migrants' staying intentions typically focus on the integration process (e.g., Li, 2022; Song et al., 2022), leaving intentions provide a forward-looking perspective on potential population turnover across the urban hierarchy. In the context of China's evolving urbanization, where a shift from concentration to deconcentration is underway, understanding migrants' leaving intentions is particularly valuable for identifying the factors shaping this transition.

This study integrates spatial equilibrium theory and differential urbanization theory, and contributes to these theories in three ways. First, it extends spatial equilibrium theory by incorporating urban hierarchy dynamics. The utility components—housing, employment and amenities—vary across the urban hierarchy and evolve with the urbanization cycle. Embedding these differentials in the three-level typology of primate, secondary and small cities makes it possible to link individual leaving intentions to the macro shift from population concentration in primate cities to deconcentration toward secondary cities (Geyer & Kontuly, 1993). This hierarchical perspective derived from differential urbanization theory proposed by Geyer and Kontuly (1993) extends earlier work that grouped cities solely by population size (Li, 2022) or administrative levels (Wang, Shen, & Liu, 2023). Second, it operationalizes spatial equilibrium theory by using recent migrants' leaving intentions as an immediate signal of disequilibrium, building on the theoretical premise that marginal populations are particularly sensitive to utility imbalances across space (Glaeser & Gottlieb, 2009). Third, it adds a spatial equilibrium perspective to explain the urbanization stages revealed by differential urbanization theory. While existing research on the evolving urban system has largely focused on regional spatial structure and intercity functional relationships (Burger, Meijers, & Van Oort, 2014; Meijers & Cardoso, 2021), our study introduces a micro-level migration perspective to show how individual utility imbalances contribute to broader shifts in the urbanization process.

Table 1
Average values of housing prices, income and amenities across the urban hierarchy in China.

Factors	Housing		Income		Amenities						
					Education		Medical care		Culture		
	Average housing prices (yuan/m ²)		Average annual income of employees (yuan)		Ratio of teachers to 100 students in regular institutions of higher education		Number of licensed doctors per 10,000 persons		Number of books in public libraries per person		
Year	2010	2020	2010	2020	2010	8.39	2020	2010	2020	2010	2020
Primate cities	15,959	49,601	60,627	158,570	7.19	8.39		24.96	35.77	2.23	2.85
Secondary cities	8111	17,095	42,181	107,628	6.05	5.86		21.64	33.75	0.96	2.28
Small cities	4235	7838	30,263	81,375	5.78	5.03		18.05	28.42	0.35	0.74

Note: The classification of cities at different levels follows the method from Wen et al. (2025). Factors of amenities follow Wang et al. (2022) and Wu et al. (2019). Data source: Anjuke and other housing transaction websites; China City Statistical Yearbook 2011 and 2021; Census data 2010.

The paper is organized as follows. First, we review theories and factors related to migrants' leaving intention. Second, the research data and methods are introduced. Third, we report the results of the differential roles of factors related to migrants' leaving intention across the urban hierarchy. Fourth, we discuss the results and highlight their implications. Finally, we conclude the key findings.

2. Theoretical framework and literature review

2.1. Theoretical framework

2.1.1. Differential urbanization theory: migration across primate, secondary and small cities

Differential urbanization theory provides a framework for understanding how migration patterns shift across different levels of the urban hierarchy. While both migration theories (Zelinsky, 1971) and urbanization theories (Champion, 1995) recognize that migration and urbanization unfolds through successive phases, few studies explicitly relate these shifts to the differentiation of city levels within a national urban system. Geyer and Kontuly (1993) propose that the urban hierarchy consists of primate cities, secondary cities, and small cities, and that net migration rates can be used to distinguish the stages of urbanization (Fig. 1).

- Primate city stage (I, II, III): Population concentrates in primate cities.
- Secondary city stage (IV, V): The influx toward secondary cities becomes dominant as primate cities experience overcrowding and agglomeration diseconomies. Deconcentration and polarization reversal begin.
- Small city stage (VI): Counter-urbanization emerges, as a growing share of the population relocates from major urban centers to smaller cities in search of favorable living conditions.

In the transition from the primate city stage to the secondary city stage, migration shifts from concentration in primate cities to deconcentration toward secondary and small cities (Geyer & Kontuly, 1993). An increasing number of migrants leave primate cities during this process, and their leaving intentions are therefore important for understanding the urbanization transition.

2.1.2. Spatial equilibrium theory: the role of housing, employment, amenity in migration

Spatial equilibrium theory provides an economic perspective for understanding why migrants choose to leave or stay in particular cities. In this framework, individuals' utility tends to equalize across different locations (Glaeser & Gottlieb, 2009). This spatial equilibrium is dynamic, responding to shocks such as technological change, policy reform, or shifts in the urbanization process (Glaeser & Gottlieb, 2009). When such shocks result in unequal utility across spaces—for instance, if region A offers higher utility than region B—individuals are likely to migrate from B to A. This movement triggers subsequent adjustments, such as rising housing prices in region A, which may reduce its utility advantage and slow further migration toward A, eventually fostering a new spatial equilibrium.

Within the spatial equilibrium framework, the Rosen–Roback model reveals three utility components: income, amenities, and housing costs (Roback, 1982; Rosen, 1979). Higher incomes compensate for expensive housing or limited amenities, whereas cheaper housing or richer amenities offset lower wages. Individuals “vote with their feet” by relocating to places that maximize their combined utility from income, housing, and amenities. Yet even after moving, if subsequent changes in wages and housing costs undercompensate for local amenity conditions—leaving total utility incompletely compensated—migrants still have an incentive to leave (Clark, Herrin, Knapp, & White, 2003). This incentive is evident for marginal populations, who are more vulnerable

to economic and social shocks (Glaeser & Gottlieb, 2009). Recent migrants, those who have moved within the past five years, are one such group (Kogan, 2006; Petintseva, 2015). Their weaker place attachment makes them particularly responsive to shifts in housing affordability, employment prospects, and amenity quality.

2.1.3. Integrative theoretical framework

To illustrate the roles of housing, employment, and urban amenities in shaping migrants' leaving intentions across the urban hierarchy, we situate the analysis within the broader urbanization process by developing a theoretical framework that integrates spatial equilibrium theory and differential urbanization theory (Fig. 2). We focus on the primate city stage and the secondary city stage, as China is currently in this phase of transition (Wen et al., 2025). The relative sizes of the triangles represent the total utility of staying in each type of city, while the relative sizes of the circles indicate the contributions of employment, housing, and amenities. In each urbanization stage, the varying utilities across the urban hierarchy together form the spatial equilibrium. The utility components vary along the urban hierarchy and shift dynamically in different urbanization stages. Migrants evaluate and compare these utility components across different city levels and tend to leave for cities offering higher utility than their current place of residence (Kley & Mulder, 2010).

In the primate city stage, migrants leave for primate cities where agglomeration effects yield high utility (Geyer & Kontuly, 1993). The initial phase of urbanization begins with a concentration of activities in locations with early advantages in resources and investment. This concentration generates increasing returns to scale, further reinforcing the polarization of population and economic activities (Richardson, 1977). In this stage, primate cities experience rapid income growth and diversified urban amenities, although these advantages are accompanied by sharply rising housing costs. By contrast, in lower-level cities, underdeveloped transport networks and the absence of agglomeration economies make them costly, risky, and less attractive to firms (Richardson, 1977). Lower-level cities thus have smaller labor markets and fewer amenities, although they retain better housing affordability. In this concentration stage, migrants tend to have the lowest leaving intention in primate cities.

This situation changes as urbanization advances. The transition from the primate city stage to the secondary city stage marks a shift from concentration to deconcentration (Geyer & Kontuly, 1993), involving a diffusion of capital and urban functions toward secondary cities (Hall & Pain, 2006). As congestion intensifies, land values rise, and living conditions deteriorate, the net agglomeration economies of primate cities weaken (Richardson, 1977). Firms begin to relocate to secondary cities that offer lower operating costs and less congested environments (Champion, 1995; Morrill, 1979). These changes narrow the gaps between primate and secondary cities in terms of income and amenities, while secondary cities might continue to retain a housing-cost advantage (Chen et al., 2019). In this case, the relative utility offered by secondary cities increases, and migrants begin to leave for these cities, thereby forming a new spatial equilibrium. During this process, migrants' leaving intentions rise in primate cities and decline in secondary cities.

To conclude, in the primate city stage, primate cities combine high employment opportunities and diverse amenities but high housing costs, while small cities show the opposite pattern, and secondary cities occupy an intermediate position. Migrants tend to have the lowest leaving intention in primate cities when agglomeration benefits are strong. As the system shifts toward deconcentration, employment and amenities in secondary cities improve and housing affordability might remain relatively favorable, increasing migrants' intention to leave primate cities. Migrants' leaving intentions thus serve as early signals of “polarization reversal” in urbanization (Richardson, 1980), the turning point from concentration to deconcentration.

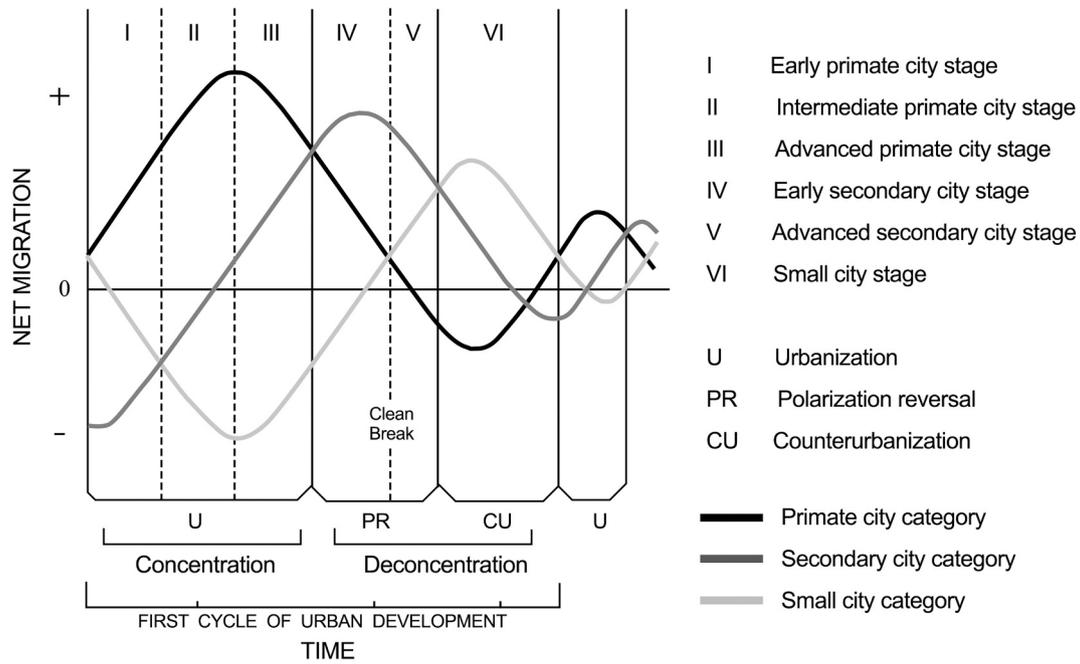


Fig. 1. Temporal characterization of differential urbanization (adapted from Geyer & Kontuly, 1993). The adapted content is that “intermediate city” was replaced by “secondary city”. The purpose is to follow the terms used in this study.

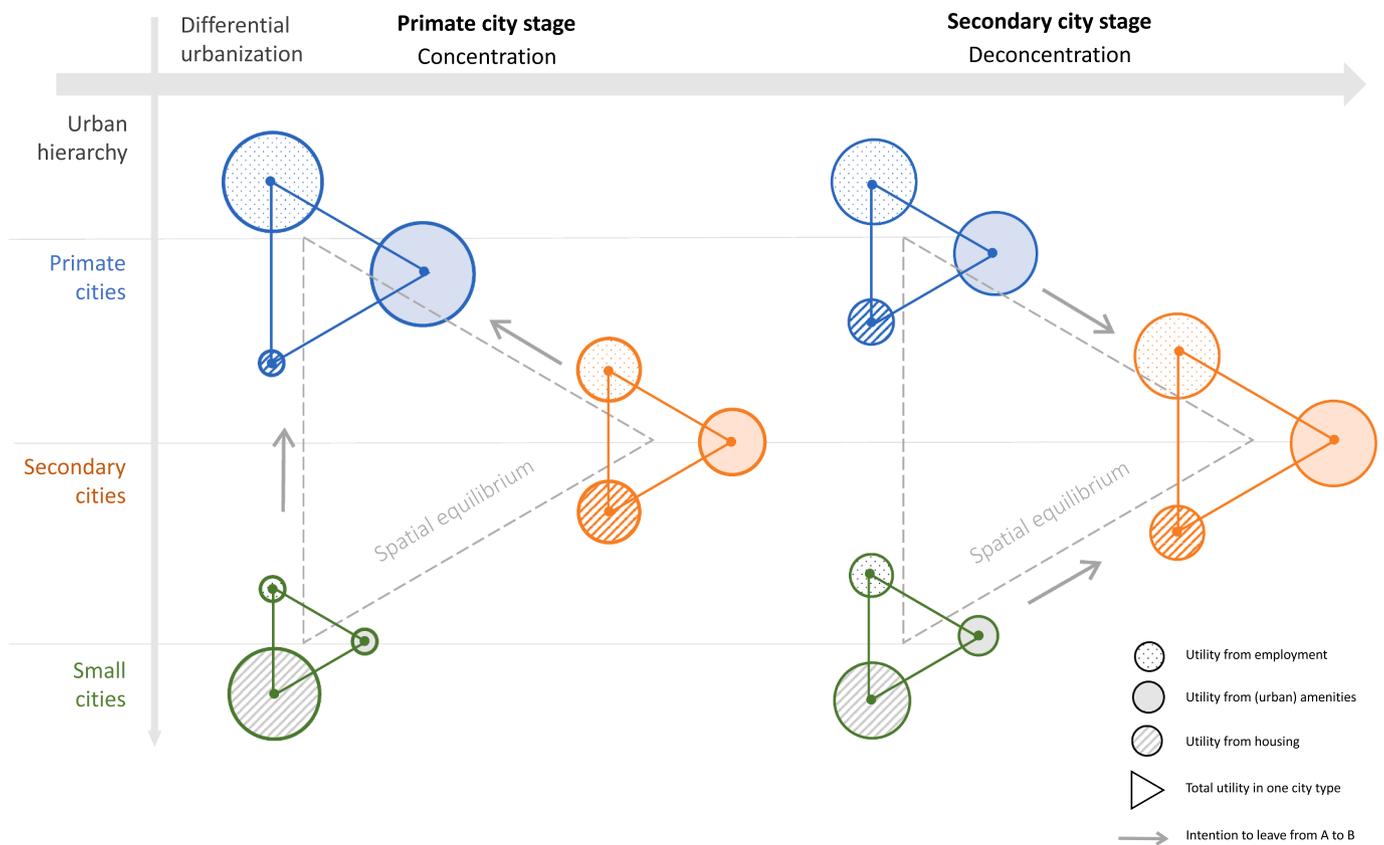


Fig. 2. Theoretical framework.

Note: 1. The size of the circles and triangles represents relative rather than actual values.

2. The diagram excludes natural amenities, as their relationships with the urban hierarchy vary across countries. For example, the commonly observed association between smaller cities and better natural amenities in Western countries is less evident in China due to uneven construction speed and environmental regulations (Champion, 1995; Han, Zhou, Pickett, Li, & Li, 2016). In empirical studies, appropriate natural amenities should be considered according to the specific context.

2.2. Literature review

2.2.1. Leaving intention and staying intention

Migrants' intention to stay and intention to leave both reflect future-oriented plans, but point in opposite behavioral directions. Intention to stay refers to a migrant's plan to remain in the host location long-term or permanently, often described as a "settlement" aspiration (Toruńczyk-Ruiz & Brunarska, 2020; Zhu & Chen, 2010). In China, this concept includes more dimensions such as hukou transfer intention¹ (Wang et al., 2023), and housing ownership intention (Lin & Zhu, 2022; Song & Zhang, 2020). In contrast, the intention to leave denotes the self-reported likelihood to leave the current destination within a given time frame, encompassing both return to the place of origin and onward migration to a third location. It is variously referred to as "remigration intention" (Caron, 2020; Chabé-Ferret, Machado, & Wahba, 2018), "onward migration intention" (Di Cristo, 2023; Ortensi & Barbiano di Belgiojoso, 2018), or "return intention" (Bonifazi & Paparusso, 2019; Carling & Pettersen, 2014). The two intentions are conceptually opposite yet not mirror images, as many migrants remain undecided.

The two constructs are shaped by overlapping determinants, with nuanced differences in emphasis. While both are influenced by social and economic factors, research on staying intentions tends to emphasize expected benefits, such as stable employment and rising wages (Sapeha, 2017), social and cultural integration (de Vroome & van Tubergen, 2014; Huang, Liu, Xue, Li, & Shi, 2018; Toruńczyk-Ruiz & Brunarska, 2020). Meanwhile, research on leaving intentions often incorporates additional negative factors, including experiences of discrimination (Li, Chi, Jansen, van der Heijden, & Boelhouwer, 2023; Puppa, Francesco, & Kofman, 2021), job insecurity caused by policy shifts (e.g. industrial relocation) (Liu et al., 2023), restricted access to local services such as children's education (Hu, Liu, Sun, & Lu, 2022), and environmental degradation (Balcar & Sulák, 2021). Focusing on leaving intentions broadens the analytical scopes by capturing the constraints that are less visible in studies of staying intentions.

2.2.2. Favoring primate cities or secondary cities?

Among existing research on migrants' intention to stay or leave across the urban hierarchy in China, many studies have applied city size to measure the urban hierarchy and revealed different results (Dang et al., 2019; Lin & Zhu, 2022; Liu & Wang, 2020; Song et al., 2022). One strand of research demonstrates that migrants in larger cities have a higher intention to settle down (Dang et al., 2019) and transfer their hukou to local hukou (Lin & Zhu, 2022; Liu & Wang, 2020). This pattern has been primarily attributed to two fundamental factors: the concentration of employment opportunities and the abundance of urban amenities in larger cities (Chen, Wu, Liu, & Wang, 2020; Liu & Wang, 2020).

However, challenging this linear relationship, recent studies have identified an inverse U-shaped pattern between city size and migrants' intention to settle (Song et al., 2022). It suggests that mid-level cities in the urban hierarchy possess optimal conditions for migrant settlement, as exemplified by Song and Zhang's (2020) analysis of housing purchase intentions among migrants. Their findings indicate that middle-ranked cities hold the advantage of providing good-quality amenities compared to small cities, while they have more friendly housing prices compared to primate cities.

2.2.3. The varying effects of housing, employment, and amenities across the urban hierarchy

While the literature has extensively examined the direct relationship between city size and settlement intentions, limited attention has focused on how factors related to migrants' leaving intentions differ across city levels. Some studies have attempted to address this issue,

though most focus on rural migrants' staying intentions. Several studies introduced interaction terms between city size and explanatory factors (Liu & Wang, 2020; Song et al., 2022), while others classified cities by population size (Li, 2022) or administrative level (Wang et al., 2023). However, few have incorporated city levels into the broader urbanization process.

Migrants' intention to leave primate cities has become a widely discussed topic in China, around which three main perspectives have emerged. The first perspective emphasizes migrants' trade-offs between high housing prices, high incomes, and diverse urban amenities in primate cities. Empirical studies reveal that high housing costs deter migrants (Chen et al., 2019; Jin, Li, Jansen, Boumeester, & Boelhouwer, 2025), and this deterring effect increases with city size (Song et al., 2022). Yet higher incomes in primate cities can offset these costs, and their positive effect on settlement intention increases with city size (Song et al., 2022) and administrative level (Wang et al., 2023). However, the income premium tends to concentrate among the more educated (Chen et al., 2019). Besides income, the diversity of urban amenities in primate cities can also reduce leaving intentions, particularly among the "creative class," whose work involves generating new ideas and who value cultural and lifestyle amenities (Florida, 2002).

The second perspective highlights the role of external forces, particularly how industrial restructuring policies and institutional restrictions influence migrants' employment and access to urban amenities, and further shape their leaving intentions. For instance, in primate cities like Beijing and Shanghai, regulatory restrictions on low-end manufacturing and environmentally harmful industries significantly influence the moving plans of migrants employed in these sectors (Liu et al., 2023; Wu et al., 2019). Moreover, some resource-limited amenities are not equally accessible to non-hukou migrants, prompting them to leave. For example, strict school admission requirements in primate cities like Beijing bring educational barriers for non-hukou migrants' children (Liu et al., 2023). Li (2022) also found that urban social insurance exerts stronger effects on rural-urban migrants' staying intention in supersized cities (primate cities) than in megacities (secondary cities), potentially due to the more restricted access to public services and amenities for non-hukou migrants in primate cities.

The third perspective concerns natural amenities such as air quality and green space, although findings remain mixed. Some studies find that natural amenities have limited influence on migration decisions (Wu et al., 2019), whereas others identify a growing deterrent effect of air pollution on the staying intentions of rural-urban migrants in large cities (Song et al., 2022). It is generally acknowledged that better-educated and wealthier populations value clean air more highly (Richardson, 1977). Therefore, natural amenities may be more influential in primate cities, where educated and affluent migrants are more concentrated.

Compared with primate cities, secondary and small cities are characterized by lower housing prices, lower incomes, and limited-quality amenities. Migrants in these cities may exhibit leaving intentions due to limited employment prospects. Employment opportunities in host cities are often a crucial factor before migration, while dissatisfaction with current employment can trigger intentions to leave (Czaika, 2015). In addition, limited urban amenities can also increase migrants' leaving intentions in these cities, particularly regarding education and health-care (Gu, Jie, Li, & Shen, 2021). However, housing tenure appears to play a more significant role in secondary cities than in primate cities. Rural migrants with self-owned housing show higher intentions to stay in megacities (secondary cities) than in supersized cities (primate cities) (Li, 2022). In China, where homeownership is closely tied to marriage norms (Li & Wu, 2014), migrants in secondary cities seem to value homeownership more strongly than those in primate cities.

In summary, in the dynamic equilibrium process across the urban hierarchy, the three sets of factors of housing, employment, and amenities play different roles in recent migrants' leaving intention in cities at different levels.

¹ Hukou is China's household registration system. Hukou transfer refers to changing one's registration from one place to another.

3. Data and methods

3.1. Data

This study draws on the China Migrants Dynamic Survey (CMDS), a nationally representative dataset collected by the National Health Commission from 2009 to 2018 (National Health Commission, 2017). The CMDS targets migrants who have lived outside their hukou registration place for more than one month, meaning all respondents are non-local hukou holders. It provides detailed microdata on migrants aged 15 and above, covering housing, employment, access to amenities, and personal characteristics. Although the 2018 CMDS is the most recent survey, this study uses the 2017 dataset for its complete coverage of key variables, for example housing tenure.

Given recent migrants' vulnerability to employment instability and housing cost pressures, the analysis focuses on those who have moved to their host city for less than five years (Kogan, 2006), yielding 66,953 cases (39.39%) from 169,989 total samples. In addition to CMDS individual-level data, city-level air quality data were obtained from the China City Statistical Yearbook (CCSY) and the provincial and municipal Environmental Statistics Bulletins.

3.2. Empirical approaches

To address our research questions, we employed a methodological approach combining binary logistic regression and interaction analyses. The first two research questions concern the associations between migrants' leaving intentions and (1) housing, employment, and amenity factors, and (2) the host city's level in the urban hierarchy. So, we employed a binary logistic regression model, given the dichotomous nature of our dependent variable (detailed in Section 3.3).

Grounded in spatial equilibrium theory, the analytical framework includes four sets of variables: housing, employment, amenities, and personal characteristics, with the level of the host city classified under personal characteristics. To assess the relative importance of these variable sets, four logistic regressions were conducted. We began with a baseline model containing only personal characteristics, followed by three additional models, each incorporating one additional set of variables (housing, employment, or amenities). Model comparison was conducted using pseudo R² values.

The third question explores how the effects of housing, employment, and amenities differ across the urban hierarchy. We conducted a multi-step interaction analysis, building on the full model from the previous stage. Interaction terms between city level and each significant independent variable were first tested separately, and the significant ones were combined in a final comprehensive model. This approach identifies how the impact of specific factors on migrants' leaving intentions varies across the urban hierarchy.

3.3. Variables

We define migrants' leaving intention as whether they plan to move out of their current city within five years, based on two CMDS survey questions. Respondents who answered "no" to "Do you plan to stay in the current city for a while in the future?" were classified as having an intention to leave. Those who answered "yes" but reported an expected stay of "less than five years" in the follow-up question were also coded as having an intention to leave. Following Huang and Chen (2022), those who answered "not sure" were excluded, leaving 41,992 valid cases (62.72% of 66,953). After excluding three cases with missing income data, the final analytical sample comprised 41,989 respondents.

The analysis incorporates four categories of independent variables: housing, employment, amenities, and personal characteristics (Table 2). Housing variables include housing tenure, housing cost-to-income ratio, and the ownership of residential land in hometown. The housing cost-to-income ratio reflects the share of household income spent on housing

Table 2
Definition of variables.

Categories	Variables	Description
Dependent variables	Leaving intention within 5 years	Have the intention to leave the current city within 5 years (yes, no)
Independent variables		
Personal characteristics	Age	The age when the survey was conducted (younger than 30, 30–50, older than 50)
	Gender	Gender (male, female)
	School-age children in the host city	Have at least one child younger than 18 and living in the host city (yes, no)
	Hukou	Hukou status (rural hukou, urban hukou)
	Level of host cities	The level of the city of the current residence (classified as primate city, secondary city, small city)
	Social integration	The extent to which migrants feel like locals in the host city (integrated, not integrated)
	City/place appreciation	The extent to which migrants like the city/place living in (appreciated, unappreciated)
Housing	Housing tenure	The ownership status of the current residence (homeownership, rental)
	Housing cost-to-income ratio	The ratio of household housing costs to household income (0, below 30%, 30%–40%, above 40%)
	Residential land in hometown	The ownership of residential land in the hometown (yes, no)
Employment	Household income	Average monthly income of the family (Q1: less than 5000 yuan/m, Q2: 5000–6500 yuan/m, Q3: 6500–9000 yuan/m, Q4: more than 9000 yuan/m)
	Occupation	Type of job and industry (professionals and technicians, businessperson, service provider, manufacturing operators, others, unemployed)
Access to amenities	Urban medical insurance	Have an urban employee medical insurance in the host city (yes, no)
	Distance to medical resource	Distance from the place of residence to the nearest medical facility (within 15 mins, more than 15 mins)
	Children's schooling issues	Whether indicate there is difficulty in children's schooling issues (yes, no)
	Air quality	Using the index of annual mean concentration of PM2.5 in the host city (excellent, good, polluted)

(rent or mortgage) (Huang & Chen, 2022; National Health Commission, 2017). Following international conventions, we employ 30% and 40% as threshold values (Cai & Xinhai, 2015). Respondents with no housing cost, approximately one-fifth of the sample, were coded separately, as they may be outright homeowners or live in family-provided housing. Residential land ownership in the hometown captures the fallback option of building homes in rural areas, which may influence leaving intentions.

Employment variables comprise household income and occupation. Household income is measured after taxes and categorized into quartiles to mitigate the effect of extreme values. Occupational categories reflect both job type and industrial sector: primary (agriculture, forestry), secondary (manufacturing, construction, transportation), and tertiary (services, catering, delivery). Due to limited samples, primary industry workers are grouped under "others."

Amenities have been refined as access to amenities. Given that city-level amenity characteristics are already reflected in the urban hierarchy, this study focuses on access to amenities at the individual level to capture unequal access among migrants. Variables include urban employee medical insurance, distance to medical resources, children's schooling issues, and air quality. Urban employee medical insurance, initially designed for local hukou holders, has gradually expanded to include some enterprise-employed migrants but still excludes many non-

hukou migrants (Wu & Ling, 2012). Distance to medical resources measures physical accessibility, based on the question: “How long does it take to reach the nearest medical facility?” Due to skewed distribution, responses were dichotomized into “within 15 minutes” and “more than 15 minutes” (combining the original 15–30, 30–60, and over 60 min categories). Children’s schooling issues identify migrants reporting educational difficulties from the multiple-choice question, “What are the main difficulties your family is currently facing in the host city?” Air quality, as a proxy for natural amenities (following Wang et al., 2022; Wu et al., 2019), is measured by the annual mean concentration of PM2.5, classified as excellent (≤ 35), good (35–75), or polluted (>75) according to the Ambient Air Quality Standards of the Ministry of Ecology and Environment.

Personal characteristics include age, gender, presence of school-age children, Hukou, the level of the host city, social integration, and city/place appreciation. The categorization of age groups is based on migrants’ life cycles, reflecting the young, middle-aged, and older stages of their lives (conform Mohabir, Jiang, & Ma, 2017). Migrants’ education level was excluded due to multicollinearity with occupation, which is a key focus of this study. Similarly, marital status was omitted because its effect is largely mediated by the presence of school-age children ($\chi^2 = 2300, p < 0.001$). Since the presence of school-age children serves as a control variable for children’s schooling issues within access to amenities, marital status was excluded to avoid redundancy and maintain theoretical focus. Social integration is derived from the statement “I feel like I am already a local,” recoded as “integrated” (agree/totally agree) or “not integrated” (disagree/totally disagree). City/place appreciation,

based on the statement “I like the city/place I live in now,” follows the same dichotomization method.

3.4. Urban hierarchy

We defined the urban hierarchy as primate, secondary, and small cities, drawing on the framework of differential urbanization theory (Geyer & Kontuly, 1993). Following Wen et al. (2025), who operationalized this framework in the Chinese context, we classify city levels based on China’s widely recognized tier system (Mu, Cui, & Cui, 2023; Wang, Shen, & Liu, 2021). Primate cities refer to the four nationally acknowledged first-tier cities: Beijing, Shanghai, Guangzhou, and Shenzhen. These cities correspond to Jefferson’s (1939) classic definition of primate cities as dominant centers “not merely in size, but in national influence.”

Secondary cities, also referred to as “intermediate cities” in Geyer and Kontuly’s (1993) framework, are defined as cities “lower in rank than the primate cities in an urban system” (Geyer & Kontuly, 1993) and as cities “sufficiently important to affect the potential performance of the national economy” (ESPON, 2012). In China, they correspond to the emerging “new first-tier cities” that serve as secondary economic and political centers at the national level (Wen et al., 2025). Cities falling outside these two categories are classified as small cities. The specific city classifications are derived from the official report of the New First-Tier City Research Institute (2017), which evaluates cities based on comprehensive indicators including business concentration, transportation connectivity, resident activeness, lifestyle diversity, and



Fig. 3. The distribution of primate cities and secondary cities in China (source: author).

growth potential. The research encompasses 356 cities, including 4 primate cities, 15 secondary cities, and 337 small cities, as shown in Fig. 3.

4. Results

4.1. Recent migrants' leaving intention

Before delving into the regression analysis, we first provide an overview of recent migrants' leaving intentions. As displayed in Table 3, 38.1% of recent migrants expressed an intention to leave their current host cities, indicating that the majority prefer to remain. Among those intending to leave, only 8.4% (1342 of 15,983) specified a destination; within this subset, the majority (79.88%) planned to return to their hometowns.

The Chi² test reveals significant differences across the urban hierarchy ($\chi^2(2) = 47.32, p < 0.001, n = 41,989$; see regression results in Section 4.3). As shown in Table 3, recent migrants in secondary cities show the lowest leaving intention (35.7%, $n = 9516$), followed by those in small cities (38.3%, $n = 28,479$), while the highest rate is found in primate cities (41.9%, $n = 3994$).

4.2. Housing, employment or amenities?

To address the first research question regarding the role of housing, employment, and access to amenities in shaping migrants' leaving intentions, we conducted logistic regression analyses with different sets of independent variables. Comparing the pseudo R² values across models (Table 4) allows assessment of the relative importance of these factors. Model 2, which includes personal characteristics and housing variables, shows greater explanatory power than Models 3 and 4. Although its pseudo R² is modest (0.177), this falls within the typical range for individual-level studies (Huang & Chen, 2022; Song & Zhang, 2020). These results indicate that housing is a more influential factor than employment or amenities in explaining variation in migrants' leaving intentions.

Table 4 presents the estimated odds ratios (OR), which quantify the strength of association between each predictor and the likelihood of leaving intention under controlled conditions. Odds ratios smaller than 1 indicate decreased likelihood of leaving intention relative to the reference group; odds ratios larger than 1 indicate increased likelihood (Szumilas, 2010). Specifically, according to the complete model (Model 5), migrants' leaving intention is related to the four sets of factors: personal characteristics, housing, employment and access to amenities.

Within personal characteristics, all variables demonstrate significant associations with leaving intentions. Middle-aged migrants (30–50 years) have an odds ratio of 0.892, indicating a significantly lower intention to leave than the reference group of migrants younger than 30 years. Gender differences remain modest but significant, with men slightly less likely to leave than women (OR = 0.937). Notably, having school-age children in the host city substantially reduces the odds of leaving (OR = 0.531), suggesting the anchoring role of children's education. Urban hukou status is associated with lower leaving intention (OR = 0.876), reflecting greater institutional integration. In line with expectations, migrants with stronger social integration (OR = 0.433) and city/place appreciation (OR = 0.415) are also significantly less likely to express an intention to leave. Together, these findings confirm that both demographic and socio-psychological attachments are important in stabilizing migrants.

Housing-related variables emerge as particularly influential. Compared with homeowners, renters are over six times more likely to consider leaving (OR = 6.219), underlining the central role of tenure security. Furthermore, migrants with a housing cost-to-income ratio below 30% are also more likely to leave than those with higher ratios, possibly reflecting weaker settlement commitment among those who invest less in local housing. Additionally, migrants with no housing

costs—such as outright homeowners or those living with family—show lower leaving intentions compared to those with the ratio below 30% (OR = 0.787), likely due to greater residential stability or stronger local ties. Notably, ownership of residential land in the migrant's hometown increases the likelihood of leaving (OR = 1.405), suggesting that fall-back housing can actively facilitate return or onward migration.

For variables in the set of employment, individuals with a monthly household income higher than 6500 yuan (Q3 and Q4) exhibit significantly lower intentions to leave compared to those with incomes below 5000 yuan (Q1). Although the second quartile is not significant, the overall trend suggests income security discourages remigration. Occupational differences also matter: professionals and technicians (OR = 0.619), businesspeople (OR = 0.614), and service workers (OR = 0.627) all show lower intentions to leave than manufacturing operators, suggesting greater dissatisfaction or instability among manufacturing operators.

Amenity-related factors also shape leaving intentions. Migrants without urban employee medical insurance are nearly twice as likely to consider leaving (OR = 1.856), highlighting the importance of institutional welfare access. Longer travel time to medical facilities (> 15 min) is also associated with higher leaving intentions. Unexpectedly, those reporting difficulties with children's schooling are less likely to intend to leave (OR = 0.662), possibly because parents addressing such issues are already more committed to staying. As for environmental quality, migrants in cities with "excellent" (OR = 1.306) or "polluted" (OR = 1.198) air are more likely to leave than those in "good" air quality cities, suggesting that moderate environments may be perceived as more practical or attainable.

4.3. Difference across the urban hierarchy

The second research question examines the role of city levels in migrants' leaving intention (see Chi² test in Section 4.1). Regression results from Model 5 (Table 4) show that migrants in secondary cities have significantly lower intentions to leave compared with those in primate and small cities.

To further investigate the third research question, whether the effects of factors on leaving intention vary across city levels, we conducted interaction analyses using Model 5 (Table 4) as the baseline. Following Model 5, we took secondary cities as the reference group, and systematically examined the statistical significance of the interaction terms between city level and each factor from Model 5. All significant interactions were subsequently combined into a final comprehensive model (Model 6, Table 5). Four variables showed statistically significant interaction effects: housing tenure, residential land in the hometown, household income, and distance to medical resources, indicating that their relationships with leaving intention vary across the urban hierarchy.

To interpret the interaction effects, we plotted the predictive margins of leaving intention against the significant factors based on Model 6. Fig. 4 shows the relationship between housing tenure and city level. Although homeownership is strongly associated with lower leaving intentions across all city levels (Table 4, $p < 0.001$, OR = 6.219), the disparity between homeowners and renters is slightly less pronounced in primate cities relative to secondary cities. This is evidenced by the statistically significant housing tenure \times city level interaction ($p < 0.01$, OR = 0.590, Table 5). Therefore, while homeownership reduces migrants' intention to leave, its effect is weaker in primate cities than in secondary cities, suggesting a smaller impact of housing tenure in primate cities.

Analysis of hometown residential land ownership reveals varying effects across city levels (Fig. 5). The difference in leaving intentions between migrants with and without hometown land is smaller in primate cities than in secondary or small cities. This difference is statistically significant between primate and secondary cities (Table 5). Combined with Table 4, this suggests that migrants without residential

Table 3
Statistical summary of recent migrants' intention to stay or leave.

	All recent migrants		In primate cities		In secondary cities		In small cities	
	N = 41,989		N = 3994		N = 9516		N = 28,479	
	stay	leave	stay	leave	stay	leave	stay	leave
	26,006 (61.9%)	15,983 (38.1%)	2320 (58.1%)	1674 (41.9%)	6115 (64.3%)	3401 (35.7%)	17,571 (61.7%)	10,908 (38.3%)
Age								
15–30	9952 (60.3%)	6546 (39.7%)	861 (51.2%)	820 (48.8%)	2311 (62.1%)	1411 (37.9%)	6780 (61.1%)	4315 (38.9%)
30–50	13,679 (63.1%)	8010 (36.9%)	1212 (63.1%)	710 (36.9%)	3196 (65.9%)	1654 (34.1%)	9271 (62.2%)	5646 (37.8%)
Older than 50	2375 (62.5%)	1427 (37.5%)	247 (63.2%)	144 (36.8%)	608 (64.4%)	336 (35.6%)	1520 (61.6%)	947 (38.4%)
Gender								
female	12,459 (61.8%)	7689 (38.2%)	1068 (57.2%)	799 (42.8%)	2872 (63.6%)	1647 (36.4%)	8519 (61.9%)	5243 (38.1%)
male	13,547 (62.0%)	8294 (38.0%)	1252 (58.9%)	875 (41.1%)	3243 (64.9%)	1754 (35.1%)	9052 (61.5%)	5665 (38.5%)
School-age children in the host city								
no	11,196 (53.1%)	9899 (46.9%)	1275 (52.4%)	1157 (47.6%)	2874 (56.2%)	2236 (43.8%)	7047 (52.0%)	6506 (48.0%)
yes	14,810 (70.9%)	6084 (29.1%)	1045 (66.9%)	517 (33.1%)	3241 (73.6%)	1165 (26.4%)	10,524 (70.5%)	4402 (29.5%)
Hukou								
rural	18,821 (58.2%)	13,525 (41.8%)	1418 (50.8%)	1374 (49.2%)	4574 (60.8%)	2946 (39.2%)	12,829 (58.2%)	9205 (41.8%)
urban	7185 (74.5%)	2458 (25.5%)	902 (75.0%)	300 (25.0%)	1541 (77.2%)	455 (22.8%)	4742 (73.6%)	1703 (26.4%)
Level of host cities								
primate	2320 (58.1%)	1674 (41.9%)	2320 (58.1%)	1674 (41.9%)	0 (%)	0 (%)	0 (%)	0 (%)
secondary	6115 (64.3%)	3401 (35.7%)	0 (%)	0 (%)	6115 (64.3%)	3401 (35.7%)	0 (%)	0 (%)
small	17,571 (61.7%)	10,908 (38.3%)	0 (%)	0 (%)	0 (%)	0 (%)	17,571 (61.7%)	10,908 (38.3%)
Social integration								
not integrated	3952 (40.8%)	5730 (59.2%)	725 (45.4%)	872 (54.6%)	1062 (45.4%)	1279 (54.6%)	2165 (37.7%)	3579 (62.3%)
integrated	22,054 (68.3%)	10,253 (31.7%)	1595 (66.5%)	802 (33.5%)	5053 (70.4%)	2122 (29.6%)	15,406 (67.8%)	7329 (32.2%)
City/place appreciation								
unappreciated	354 (35.0%)	656 (65.0%)	38 (33.6%)	75 (66.4%)	81 (38.6%)	129 (61.4%)	235 (34.2%)	452 (65.8%)
appreciated	25,652 (62.6%)	15,327 (37.4%)	2282 (58.8%)	1599 (41.2%)	6034 (64.8%)	3272 (35.2%)	17,336 (62.4%)	10,456 (37.6%)
Housing tenure								
homeownership	10,747 (90.8%)	1087 (9.2%)	577 (89.5%)	68 (10.5%)	2374 (92.1%)	203 (7.9%)	7796 (90.5%)	816 (9.5%)
renting	15,259 (50.6%)	14,896 (49.4%)	1743 (52.0%)	1606 (48.0%)	3741 (53.9%)	3198 (46.1%)	9775 (49.2%)	10,092 (50.8%)
Housing cost-to-income-ratio								
no cost	5561 (86.4%)	877 (13.6%)	305 (89.2%)	37 (10.8%)	975 (88.5%)	127 (11.5%)	4281 (85.7%)	713 (14.3%)
Below 30%	16,905 (54.8%)	13,951 (45.2%)	1667 (52.9%)	1486 (47.1%)	4299 (58.6%)	3034 (41.4%)	10,939 (53.7%)	9431 (46.3%)
30%–40%	1969 (77.6%)	570 (22.4%)	190 (69.1%)	85 (30.9%)	521 (80.2%)	129 (19.8%)	1258 (77.9%)	356 (22.1%)
Above 40%	1571 (72.9%)	585 (27.1%)	158 (70.5%)	66 (29.5%)	320 (74.2%)	111 (25.8%)	1093 (72.8%)	408 (27.2%)
Residential land in hometown								
yes	13,770 (55.1%)	11,221 (44.9%)	1063 (50.3%)	1052 (49.7%)	3512 (57.8%)	2560 (42.2%)	9195 (54.7%)	7609 (45.3%)
no	12,236 (72.0%)	4762 (28.0%)	1257 (66.9%)	622 (33.1%)	2603 (75.6%)	841 (24.4%)	8376 (71.7%)	3299 (28.3%)
Household income								
Below 5000	8722 (59.5%)	5935 (40.5%)	311 (49.9%)	312 (50.1%)	1430 (57.2%)	1070 (42.8%)	6981 (60.5%)	4553 (39.5%)
5000–6500	4064 (59.2%)	2802 (40.8%)	196 (41.7%)	274 (58.3%)	975 (60.7%)	630 (39.3%)	2893 (60.4%)	1898 (39.6%)
6500–9000	6043 (60.4%)	3967 (39.6%)	440 (46.7%)	502 (53.3%)	1710 (64.0%)	962 (36.0%)	3893 (60.9%)	2503 (39.1%)
Above 9000	7177 (68.6%)	3279 (31.4%)	1373 (70.1%)	586 (29.9%)	2000 (73.0%)	739 (27.0%)	3804 (66.1%)	1954 (33.9%)
Occupation								
professionals and technicians	3011 (74.4%)	1034 (25.6%)	544 (71.7%)	215 (28.3%)	704 (75.5%)	229 (24.5%)	1763 (74.9%)	590 (25.1%)
businessperson	5176 (61.2%)	3279 (38.8%)	360 (59.3%)	247 (40.7%)	1212 (66.3%)	615 (33.7%)	3604 (59.9%)	2417 (40.1%)
service provider	7554 (61.4%)	4750 (38.6%)	613 (53.9%)	525 (46.1%)	1911 (63.1%)	1116 (36.9%)	5030 (61.8%)	3109 (38.2%)
manufacturing operators	3571 (49.1%)	3706 (50.9%)	298 (44.6%)	370 (55.4%)	962 (51.8%)	894 (48.2%)	2311 (48.6%)	2442 (51.4%)

(continued on next page)

Table 3 (continued)

	All recent migrants		In primate cities		In secondary cities		In small cities	
	N = 41,989		N = 3994		N = 9516		N = 28,479	
	stay	leave	stay	leave	stay	leave	stay	leave
	26,006 (61.9%)	15,983 (38.1%)	2320 (58.1%)	1674 (41.9%)	6115 (64.3%)	3401 (35.7%)	17,571 (61.7%)	10,908 (38.3%)
others	1281 (63.5%)	736 (36.5%)	107 (62.9%)	63 (37.1%)	225 (61.1%)	143 (38.9%)	949 (64.2%)	530 (35.8%)
unemployed	5413 (68.6%)	2478 (31.4%)	398 (61.0%)	254 (39.0%)	1101 (73.2%)	404 (26.8%)	3914 (68.3%)	1820 (31.7%)
Urban medical insurance								
yes	6998 (75.2%)	2302 (24.8%)	1246 (70.0%)	535 (30.0%)	2060 (76.0%)	650 (24.0%)	3692 (76.8%)	1117 (23.2%)
no	19,008 (58.1%)	13,681 (41.9%)	1074 (48.5%)	1139 (51.5%)	4055 (59.6%)	2751 (40.4%)	13,879 (58.6%)	9791 (41.4%)
Distance to medical resource								
Within 15 mins	21,968 (62.0%)	13,451 (38.0%)	1915 (59.1%)	1327 (40.9%)	5224 (64.4%)	2887 (35.6%)	14,829 (61.6%)	9237 (38.4%)
More than 15 mins	4038 (61.5%)	2532 (38.5%)	405 (53.9%)	347 (46.1%)	891 (63.4%)	514 (36.6%)	2742 (62.1%)	1671 (37.9%)
Children's schooling issues								
no difficulty	20,368 (60.0%)	13,564 (40.0%)	1811 (56.0%)	1423 (44.0%)	4912 (62.5%)	2949 (37.5%)	13,645 (59.7%)	9192 (40.3%)
with difficulty	5638 (70.0%)	2419 (30.0%)	509 (67.0%)	251 (33.0%)	1203 (72.7%)	452 (27.3%)	3926 (69.6%)	1716 (30.4%)
Air quality								
excellent	6135 (55.1%)	4996 (44.9%)	530 (50.3%)	524 (49.7%)	448 (52.0%)	414 (48.0%)	5157 (56.0%)	4058 (44.0%)
good	16,908 (64.8%)	9193 (35.2%)	1790 (60.9%)	1150 (39.1%)	5286 (65.3%)	2811 (34.7%)	9832 (65.3%)	5232 (34.7%)
polluted	2963 (62.3%)	1794 (37.7%)	0 (.%)	0 (.%)	381 (68.4%)	176 (31.6%)	2582 (61.5%)	1618 (38.5%)

land in hometown show lower intention to leave the host city, while its effect is statistically significantly weaker in primate cities than in secondary cities.

The relationship between household income and leaving intentions varies across the urban hierarchy. As shown in Fig. 6, leaving intentions decline with rising income in secondary cities, whereas primate cities show a non-linear pattern: middle-income migrants (Q2 and Q3) have higher leaving intentions than low-income migrants (Q1), while high-income migrants (Q4) are least likely to leave. Table 5 identifies statistically significant interactions for Q2 and Q3 in primate cities, with odds ratios above 1, indicating that these income-city combinations amplify leaving intentions beyond what would be expected from their independent effects. Together, Table 4 and Table 5 suggest that medium income in primate cities is associated with higher leaving intentions.

The effect of medical resource accessibility varies across the urban hierarchy. Table 4 shows that migrants living more than 15 min from medical facilities are more likely to intend to leave than those within a 15-min distance. Although this overall difference appears small (see the “as-observed” line in Fig. 7), it varies notably by city level. Migrants in primate and secondary cities demonstrate a higher intention to leave when medical access is limited, while those in small cities show only a slight difference. Table 5 further indicates that this effect is statistically significantly weaker in small cities than in secondary cities, suggesting that medical accessibility plays a greater role for migrants in secondary cities than in small cities.

5. Discussion

5.1. The importance of housing in migrants' leaving intention

The first research question examines the role of personal characteristics, housing, employment, and access to amenities in recent migrants' leaving intention. Personal characteristics provide initial context for migrants' intentions. Migrants with school-age children residing in the host city show a notably lower intention to leave, aligning with Liu et al. (2023), who emphasize children's stabilizing effect on migrant settlement decisions. Furthermore, stronger social integration and greater city appreciation significantly decrease leaving intentions, aligning with Carling and Pettersen (2014) and Lu, Guo, Li, and Qian (2024). These

results suggest that family ties, social integration, and positive urban experiences anchor migrants within their current cities.

Notably, housing emerges as a more important factor shaping recent migrants' leaving intention, compared to employment and access to amenities. This is particularly evident in the role of housing tenure, which exhibits the highest odds ratio (6.219) among all the variables in Model 5 (Table 4). The significantly higher leaving intention among renters is consistent with findings by Huang and Chen (2022) and Steiner (2019). They explain that homeownership enhances migrants' sense of embeddedness and reduces their intention to leave (Huang & Chen, 2022; Steiner, 2019). Furthermore, those intending to stay also seek formal housing and improved housing quality in their host cities (Liu, Wang, & Chen, 2017; Yang & Guo, 2018).

In addition, the ownership of residential land in hometown also plays a significant role in migrants' leaving intention. Migrants with such land are more likely to express a stronger intention to leave compared to those without. The finding aligns with Hao and Tang's (2015) results, which attribute this to migrants' emotional ties and economic security considerations. This suggests that residential land in hometown functions as a form of fallback housing, enabling migrants to consider return or onward migration with reduced risk (Hao, 2021).

Counterintuitively, a higher housing cost-to-income ratio is associated with lower leaving intention. Migrants spending less than 30% of their income on housing (excluding those without housing costs) exhibit higher leaving intentions than those with higher ratios. This supports Huang and Chen's (2022) observation that a greater willingness to allocate income to housing often signals stronger commitment to homeownership and long-term settlement. By contrast, migrants with lower housing expenditures may prioritize savings or remittances to their hometown, thus showing stronger intentions to leave (Huang & Chen, 2022).

Employment conditions further shape leaving intentions: higher income generally reduces migrants' leaving intention, while manufacturing workers face more unstable or unsatisfactory situation. Specifically, higher household income (Q3 and Q4) correlates with lower leaving intention, consistent with existing studies that reveal the general positive role of higher income in migrants' intentions to stay (Zhu & Chen, 2010). Additionally, our models reveal that migrants working in manufacturing show the highest leaving intention. This

Table 4
Logistic regression results of recent migrants' leaving intention.

	(1)	(2)	(3)	(4)	(5)
	Personal characteristic				
		+Housing	+Employment	+Amenities	+Housing
					+Employment
					+Amenities
Personal characteristics					
Age (ref. = younger than 30)					
30–50	0.955* (0.022)	0.918*** (0.022)	0.888*** (0.021)	0.942* (0.022)	0.892*** (0.022)
Older than 50	0.778*** (0.031)	1.033 (0.046)	0.781*** (0.033)	0.740*** (0.030)	0.987 (0.046)
Gender (ref. = female)					
Male	1.011 (0.022)	0.967 (0.022)	0.939** (0.021)	1.044* (0.023)	0.937** (0.023)
School-age children in the host city (ref. = no)					
Yes	0.439*** (0.010)	0.482*** (0.011)	0.450*** (0.010)	0.467*** (0.011)	0.531*** (0.013)
Hukou (ref. = rural)					
Urban	0.503*** (0.014)	0.749*** (0.024)	0.566*** (0.016)	0.586*** (0.016)	0.876*** (0.029)
Level of host cities (ref. = secondary)					
primate	1.116** (0.046)	1.001 (0.043)	1.272*** (0.054)	1.177*** (0.050)	1.134** (0.051)
small	1.261*** (0.033)	1.352*** (0.038)	1.226*** (0.033)	1.066* (0.030)	1.161*** (0.035)
Social integration (ref. = not integrated)					
integrated	0.343*** (0.009)	0.435*** (0.012)	0.348*** (0.009)	0.342*** (0.009)	0.433*** (0.012)
City/place appreciation (ref. = unappreciated)					
appreciated	0.460*** (0.033)	0.421*** (0.033)	0.457*** (0.033)	0.455*** (0.033)	0.415*** (0.033)
Housing					
Housing tenure (ref. = homeownership)					
Rental		6.899*** (0.286)			6.219*** (0.264)
Housing cost-to-income ratio (ref. = below 30%)					
No costs		0.819*** (0.041)			0.787*** (0.040)
30%–40%		0.661*** (0.036)			0.684*** (0.038)
Above 40%		0.723*** (0.040)			0.730*** (0.041)
Residential land in hometown (ref. = no)					
Yes		1.426*** (0.038)			1.405*** (0.038)
Employment					
Household income (ref. = less than 5000 yuan/m, first quartile Q1)					
5000–6500 yuan/m (second quartile Q2)			0.985 (0.032)		1.030 (0.035)
6500–9000 yuan/m (third quartile Q3)			0.868*** (0.025)		0.926* (0.029)
More than 9000 yuan/m (fourth quartile Q4)			0.638*** (0.019)		0.733*** (0.024)
Occupation (ref. = manufacturing operators)					
Professionals and technicians			0.422*** (0.020)		0.619*** (0.031)
Businessperson			0.728*** (0.025)		0.614*** (0.024)
Service provider			0.661*** (0.021)		0.627*** (0.022)
Others			0.581*** (0.032)		0.641*** (0.038)
Unemployed			0.498*** (0.019)		0.574*** (0.024)
Access to amenities					
Urban medical insurance (ref. = yes)					
No				2.059*** (0.061)	1.856*** (0.063)
Distance to medical resource (within 15 mins)					
More than 15 mins				0.993 (0.029)	1.067* (0.034)

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Table 4 (continued)

	(1)	(2)	(3)	(4)	(5)
	Personal characteristic				
		+Housing	+Employment	+Amenities	+Housing
					+Employment
					+Amenities
Children's schooling issues (ref. = no)					
Yes				0.709*** (0.021)	0.662*** (0.021)
Air quality (ref. = good)					
excellent				1.436*** (0.037)	1.306*** (0.036)
polluted				1.077* (0.038)	1.198*** (0.046)
Constant	4.422*** (0.338)	0.636*** (0.059)	8.067*** (0.671)	2.516*** (0.204)	0.723** (0.075)
Number of obs.	41,989	41,989	41,989	41,989	41,989
Loglikelihood	-25,589.5	-22,953.8	-25,201.0	-25,111.3	-22,459.5
Pseudo R2	0.0827	0.1772	0.0966	0.0998	0.1949

Note: 1) the base group for the dependent variable of leaving intention are migrants who choose to stay the destination city for more than 5 years.

2) Odds ratios are reported with standard errors in parentheses.

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$.

aligns with the results by Gu, Ling, and Shen (2021) that migrants working in the secondary industry express a higher intention to return than those in the tertiary industry. As explained in Section 2.2, prior studies highlight how policies of abandoning low-end manufacturing in primate cities increase uncertainties for manufacturing workers (Liu et al., 2023). However, our analysis shows no variation across the urban hierarchy (Table 5), possibly because the upgraded high-tech manufacturing in primate cities still attracts migrants to settle down in these big cities (Liu & Liu, 2024).

Finally, access to amenities, particularly medical services, significantly shapes migrants' leaving intentions. Migrants with an urban employee medical insurance exhibit significantly lower intentions to leave, consistent with a study by Gu, Ling, and Shen (2021). In addition, migrants indicating difficulties in children's schooling issues show lower leaving intention. This counterintuitive relationship may be explained by the fact that parents who actively engage with educational challenges have likely already made a psychological commitment to long-term settlement. While previous research has shown that city-level educational resources serve as an attractive force for migrant retention (Wang et al., 2022), our results indicate that the problems of individual access to education resources might not be the main concerns for migrants who consider leaving.

Air quality presents a nuanced effect: migrants residing in cities with medium-quality air exhibit the lowest levels of leaving intention. On the one hand, high pollution can deter settlement due to its detrimental impact on health (Li et al., 2023, b), especially sensitive for migrants with young children (Balcar & Šulák, 2021). On the other hand, high-quality air in some Chinese cities is often associated with insufficient development opportunities (Wang et al., 2021). The high leaving intention in cities with high-quality air likely reflects migrants' prioritization of career advancement over environmental quality in China's developing and industrializing economies (Liu & Shen, 2014; Wu et al., 2019). Thus, high-quality air appears to remain a secondary concern for migrants when planning whether to leave.

5.2. The different role of housing, employment and amenities across the urban hierarchy

Regarding the second research question, our findings indicate that migrants in secondary cities exhibit a statistically significant lower

intention to leave compared to those in small and primate cities. This observation aligns with Song et al. (2022), who identified an inverse U-shaped relationship between city size and migrants' intention to stay. Although China is still in an urbanization stage dominated by concentration (Wen et al., 2025), the notably lower leaving intentions observed in secondary cities may signal an early shift from concentration to deconcentration.

To further understand this transition process, we examined the distinct roles of housing, employment, and access to amenities across the urban hierarchy in our third research question. Firstly, in primate cities, income plays a distinctive role in migrants' intention to leave. As illustrated in Fig. 6, medium-income migrants in these cities demonstrate the highest intention to leave. This phenomenon can be attributed to the challenges faced by medium-income groups in primate cities. As discussed in Section 2.1, primate cities benefit from strong agglomeration effects, offering abundant employment opportunities and diverse urban amenities, yet they also feature high housing costs (Chen et al., 2019). According to the concept of incomplete compensation within spatial equilibrium theory (Clark et al., 2003), although primate cities offer superior urban amenities, medium-income groups may find it difficult to compensate for the substantial housing costs required to maintain housing quality with their limited income. Consequently, these recent medium-income migrants might feel undercompensated and exhibit a higher intention to leave. In addition, from the perspective of evolving urbanization analyzed in Section 2.1, the transition toward the secondary city stage involves firms relocating from primate cities due to high operating costs and congested working conditions (Champion, 1995; Morrill, 1979). In particular, some lower-order functions, such as manufacturing industries, disperse from primate cities to smaller cities (Hall & Pain, 2006). This shift increases job opportunities in smaller cities, which may become viable alternatives for medium-income migrants. It appears that these medium-income migrants constitute a key group driving the deconcentration trend in urbanization.

Secondly, while homeownership generally reduces migrants' intention to leave, its effect is more pronounced in secondary cities than in primate cities (see Table 5 and Fig. 4). This finding supports Li (2022), who noted that housing conditions more significantly influence rural-urban migrants' intention to settle in secondary cities than primate cities. According to the conceptual framework in Section 2.1, as urbanization progresses, gaps in income and amenities between primate and

Table 5
Significant interaction results between factors and city levels.

(6)	Odds ratio	Standard errors
Personal characteristics		
Age (ref. = younger than 30)		
30–50	0.892***	0.022
Older than 50	0.981	0.046
Gender (ref. = female)		
Male	0.938**	0.023
School-age children in the host city (ref. = no)		
Yes	0.530***	0.013
Hukou (ref. = rural)		
Urban	0.873***	0.029
Level of host cities (ref. = secondary)		
primate	1.809**	0.345
small	1.161	0.119
Social integration (ref. = not integrated)		
integrated	0.434***	0.012
City/place appreciation (ref. = unappreciated)		
appreciated	0.415***	0.033
Housing		
Housing tenure (ref. = homeownership)		
Rental	6.434***	0.528
Housing tenure × City level (ref. = homeownership × secondary)		
Rental × Primate	0.590**	0.096
Rental × Small	0.991	0.089
Housing cost-to-income ratio (ref. = below 30%)		
No costs	0.789***	0.040
30%–40%	0.683***	0.038
Above 40%	0.731***	0.042
Residential land in hometown (ref. = no)		
Yes	1.482***	0.082
Residential land in hometown × City level (ref. = no × secondary)		
Yes × Primate	0.761**	0.070
Yes × Small	0.956	0.058
Employment		
Household income (ref. = less than 5000 yuan/m, first quartile Q1)		
5000–6500 yuan/m (second quartile Q2)	0.953	0.07
6500–9000 yuan/m (third quartile Q3)	0.832**	0.054
More than 9000 yuan/m (fourth quartile Q4)	0.661***	0.044
Household income × City level (ref. = Q1 × secondary)		
Q2 × Primate	1.582**	0.238
Q2 × Small	1.062	0.089
Q3 × Primate	1.447**	0.185
Q3 × Small	1.113	0.083
Q4 × Primate	1.079	0.132
Q4 × Small	1.169*	0.09
Occupation (ref. = manufacturing operators)		
Professionals and technicians	0.622***	0.032
Businessperson	0.611***	0.024
Service provider	0.626***	0.022
Others	0.644***	0.039
Unemployed	0.575***	0.025
Access to amenities		
Urban medical insurance (ref. = yes)		
No	1.857***	0.063
Distance to medical resource (within 15 mins)		
More than 15 mins	1.256**	0.088
Distance to medical resource × City level (within 15 mins × secondary)		
More than 15 mins × Primate	1.040	0.12
More than 15 mins × Small	0.782**	0.063
Children's schooling issues (ref. = no)		
Yes	0.664***	0.021
Air quality (ref. = good)		
excellent	1.305***	0.036
polluted	1.203***	0.046
Constant	0.708**	0.092
Observations	41,989	
Loglikelihood	−22,430	
Pseudo R2	0.196	

Note: the base group for the dependent variable of leaving intention are migrants who choose to stay the destination city for more than 5 years.

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

secondary cities gradually narrow. However, current housing prices in secondary cities remain much lower—approximately half the level of primate cities (Chen et al., 2019). In this context, homeownership serves as a vital compensatory factor for migrants in secondary cities. Additionally, affordable housing strategies in secondary cities, exemplified by cases such as Hangzhou discussed in the Introduction, are likely to attract households who value homeownership.

Furthermore, the possession of residential land in migrants' hometowns correlates with higher leaving intentions, with this effect being stronger in secondary cities than in primate cities (Table 5 and Fig. 5). This pattern reflects the distinct roles of different city levels: while primate cities serve as national growth poles, secondary cities typically function as regional and provincial centers (Geyer & Kontuly, 1993). Larger cities tend to attract cross-provincial migrants, whereas smaller cities predominantly draw within-provincial migrants (Li, 2022). Consequently, shorter-distance migrants in secondary cities may maintain a closer connection to their hometowns, which influences their plans on whether to leave.

Thirdly, higher accessibility to medical resources correlates more strongly with lower leaving intentions in secondary cities than in small cities (Table 5; Fig. 7). As discussed in Section 2.1, in the current primate city stage, small cities have limited amenities and smaller labour markets due to weaker transport connectivity and the absence of agglomeration economies (Richardson, 1977). According to spatial equilibrium theory, despite the higher housing prices in secondary cities relative to small cities, these costs can be compensated by their superior incomes and urban amenities. Specifically, access to medical resources, as a key amenity, emerges as a significant compensatory factor for migrants in secondary cities compared to those in small cities.

5.3. Policy implications and limitations

Under differential urbanization theory, China is currently in the intermediate primate city stage, where net migration to primate cities has slowed, while inflows to secondary cities continue to increase (Wen et al., 2025). Our results show that recent migrants in secondary cities report a markedly lower intention to leave than those in primate or small cities. The appeal of secondary cities shows an early signal of a potential shift toward the secondary city stage. This emerging shift from population concentration in primate cities to deconcentration in secondary cities suggests that disparities in utility components—housing, employment, and amenities—are expected to narrow (as explained in Section 2.1). In such a dynamic context, one-size-fits-all policies are insufficient; city-specific and forward-looking strategies are essential.

In the evolving urbanization of primate cities, advantages in income and amenities appear to have plateaued, while housing costs remain persistently high (Chen et al., 2019). Our findings indicate that these advantages increasingly fail to offset housing cost burdens, particularly for middle-income migrants, who show high leaving intention. Therefore, primate cities need to preserve their income premium and relieve housing pressures on this group, for example through a greater supply of reasonably priced rental housing. This aligns with China's recent national strategy of Affordable Rental Housing (ARH), which explicitly targets new citizens and young people (Li et al., 2025). Comparable evidence from the United States shows that strict housing supply and resulting high prices in the most productive metropolitan areas have already displaced labor to lower-cost cities (Glaeser & Gyourko, 2018).

In contrast, secondary cities appear to retain their advantage in housing affordability while steadily enhancing amenity provision (Chen et al., 2019; Song & Zhang, 2020). Our results imply that their greater homeownership opportunities help compensate for relatively lower incomes compared to primate cities, while superior medical amenity accessibility offsets higher housing costs relative to small cities. To

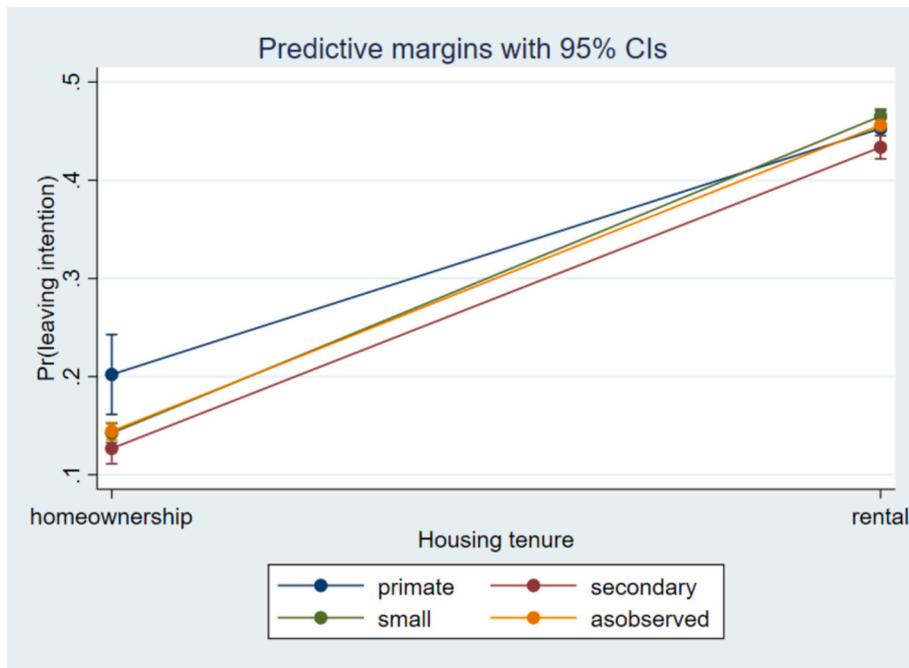


Fig. 4. The predictive margins of leaving intention: housing tenure and city level. Note: the line of “asobserved” represents the actual values from the dataset for the whole selected sample.

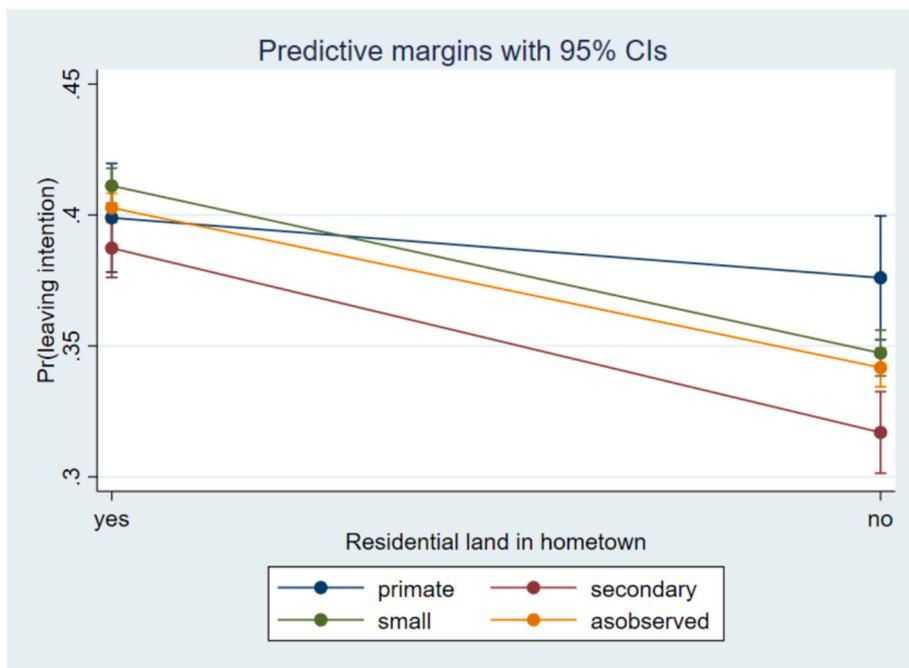


Fig. 5. The predictive margins of leaving intention: residential land in hometown and city level.

consolidate this emerging advantage, secondary cities should further expand affordable-homeownership programs and continue to enhance key amenities, particularly medical resources. This insight echoes U.S. evidence showing that richer urban amenities and a more flexible housing supply have powered the rise of several secondary cities (Glaeser & Gottlieb, 2009; Williams & Pendas, 2021).

Finally, universally applicable strategies across all city levels include addressing the settlement challenges of manufacturing workers, expanding urban medical insurance, and enhancing air quality in polluted areas.

This study has two limitations. First, we excluded migrants who were “not sure” about their intention to leave, representing one-third of the sample. While these individuals are of interest, we did not examine them in detail to maintain the focus and conciseness of the article. Future research can explore the factors behind their uncertainty and the barriers they face. Second, the survey’s limited number of amenity-related variables restrict a comprehensive assessment of access to various amenities, as the survey was primarily designed based on medical issues.

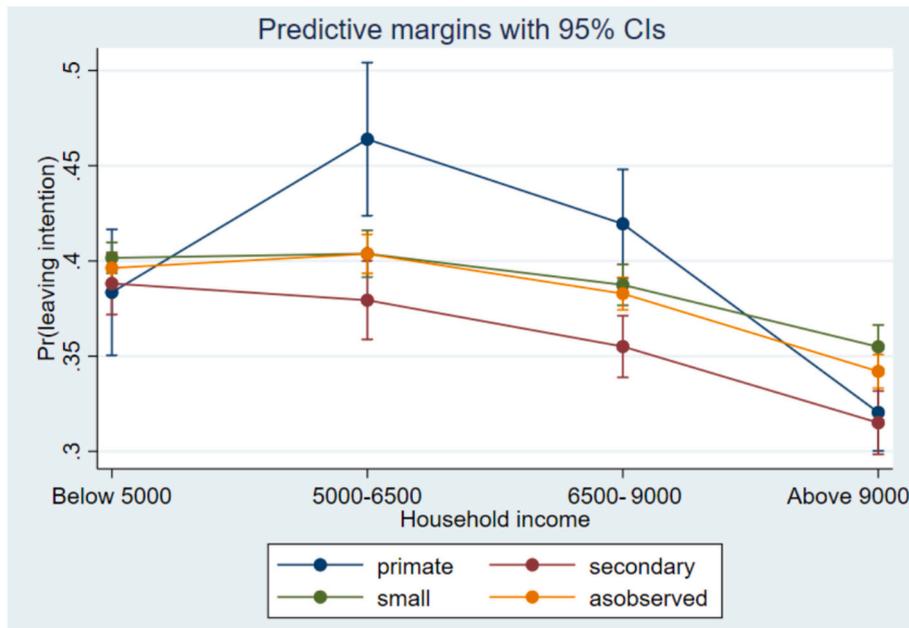


Fig. 6. The predictive margins of leaving intention: household income and city level.

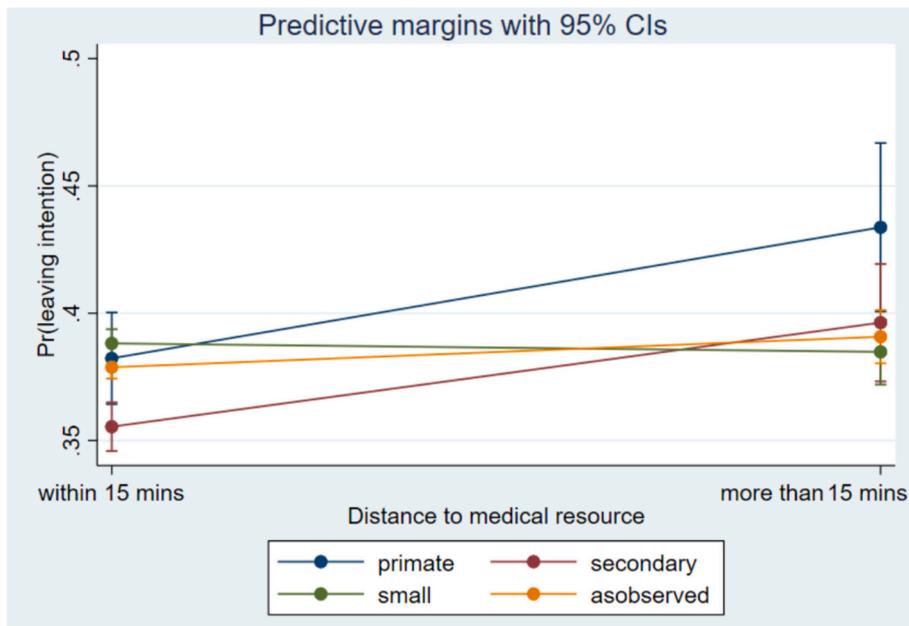


Fig. 7. The predictive margins of leaving intention: distance to medical resource and city level.

6. Conclusion

This study examines the role of housing, employment, and access to amenities in recent migrants' intention to leave across China's urban hierarchy. While existing research has primarily focused on migrants' intentions to stay, our emphasis on leaving intentions offers additional theoretical perspectives. Firstly, leaving intentions reflect plans for change, which offers a dynamic perspective that situates individual migration decisions within broader urbanization trends. This perspective enables us to explain migration factors derived from spatial equilibrium theory within the macro urbanization trajectory described by differential urbanization theory. Secondly, focusing on leaving intentions broadens the analysis by highlighting the negative factors that prompt migrants to leave, rather than merely the positive factors that

encourage them to stay. This perspective offers a more nuanced understanding of migrants' moving plans.

Our findings reveal that housing is a more significant factor related to recent migrants' intention to leave compared to employment and access to amenities. The role of these factors vary significantly across city levels. In primate cities, income plays a distinctive role, with medium-income migrants most likely to consider leaving. In secondary cities, on the one hand, housing-related factors appear to be more important than in primate cities, as living in rental housing and owning residential land in their hometowns more strongly increase migrants' leaving intentions in secondary cities compared to primate cities. On the other hand, urban amenities such as medical amenities seem to play a more important role in secondary cities than in small cities, as higher accessibility to medical resources more significantly reduces migrants'

leaving intentions in secondary cities than in small cities.

Recent migrants in secondary cities exhibit a statistically significantly lower intention to leave compared to those in both primate and small cities. This suggests that secondary cities may achieve a more optimal balance among housing, employment, and amenities. Specifically, although primate cities offer higher incomes, greater homeownership opportunities in secondary cities appear to be a significant compensatory factor for migrants. Additionally, accessibility to medical amenities in secondary cities compensates for their higher housing costs compared to small cities. These findings suggest policymakers can develop city-level-specific strategies focusing on housing, employment, and amenities to enhance migrant retention and support sustainable urban development in various urbanization stages.

CRedit authorship contribution statement

Jun Wen: Writing – review & editing, Writing – original draft, Visualization, Software, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Sylvia J.T. Jansen:** Writing – review & editing, Supervision. **Harry van der Heijden:** Writing – review & editing, Supervision. **Bo Li:** Writing – review & editing, Supervision. **Peter J. Boelhouwer:** Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

Data will be made available on request.

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