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Article

How Do the Urban Household Registration Thresholds Affect the Settlement Intentions of Rural-Urban Migrants in China?

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Abstract: China's substantial floating population constitutes a pivotal demographic cohort necessitating attention in fostering equity in basic public service provision. This research delves into the implications and mechanisms underlying adjustments to the urban household registration threshold on the attainment of citizenship status by the rural-urban migrants, employing the household registration threshold as pivotal variable. Our findings reveal a dual-faceted influence of the threshold on the settlement intentions of rural-urban migrants. Firstly, a stringent threshold for registration underscores the inaccessibility of citizenship for this migrant segment, thereby exerting a pronounced crowding-out effect on their settlement aspirations. Notably, skilled rural-urban migrants without housing exhibit heightened sensitivity to this elevated threshold. Secondly, from an urban scale perspective, the escalation of the registration threshold has manifested a crowding-out phenomenon among migrants in Type I large cities, metropolises, and megacities. Specifically, the most pronounced crowding-out effect is observed in megacities, where rising settlement thresholds, coupled with expanding urban population, diminish the welfare benefits enjoyed by migrants, thereby fostering a tendancy for them to relocate and seek alternative development opportunities in other cities. This study offers a nuanced understanding of how the household registration threshold modulates the settlement intentions of rural-urban migrants, providing mathematical underpinnings for informed urban development strategies.

Keywords: Household Registration Threshold; Settlement Intention of Rural-Urban Migrants; Instrumental Variable (IV) estimation

1. Introduction

In 2023, China's permanent urban population has reached 932.67 million, marking an increase of 11.96 million from the end of the previous year. Conversely, the rural permanent population stands at 477 million, experiencing a decline of 14.04 million. The proportion of the urban population to the total national population, known as the urbanization rate, has risen to 66.16%.

In July 2024, China formally adopted a significant decision to further advancing reforms and accelerating Chinese-style modernization (hereinafter cited as " the Decision"), emphasizing the necessity to refine and enhance the frameworks and mechanisms facilitating the progress of novel urbanization. This Decision advocates the establishment of a mutually beneficial dynamic system that synergizes industrial upgrading, population clustering, and urban expansion.

To this end, the system of providing essential public services shall be fortified, aligning with permanent residence registration system. Specifically, it aims to extend social insurance, housing security, and equal access to compulsory education for eligible migrant children from rural backgrounds, mirroring the privileges enjoyed by locally registered residents. Furthermore, the

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citizenization process for rural-urban migrants will be expedited, ensuring their seamless integration into urban life. Concurrently, the protection of legitimate land rights and interests of farmers who have settled in urban areas remains paramount. This includes safeguarding their land contracting rights, homestead usage rights, and entitlement to collective income distribution, all in accordance with the law. Additionally, The Decision encourages the exploration of voluntary and compensated mechanisms for withdrawing from rural areas and addressing rights issues, catering to the evolving needs of urbanizing populations.

As urbanization progresses, the traditional barriers imposed by the registered residence system, which once hindered the free flow of population and labor from rural to urban areas, have gradually eroded. While urban and rural residents now enjoy greater mobility, freedom of residence, and employment opportunities, disparities in accessing fundamental public services, which are still largely tied to one's registered residence, pose a formidable challenge to achieving equitable public service delivery across the nation. Thus, addressing this issue becomes a critical juncture in advancing towards a more inclusive and equitable society.

The ongoing reform and incomplete adjustment of the registered residence system are empirically manifested in the disparities observed between the urbanization rates of the permanent population and those of the officially registered population. Specifically, as of 2021, these rates stand at 64.7% and 46.7%, respectively, indicative of a notable divergence. This translates into a senario where the urban population, as defined by permanent criteria, amounts to approximately 914 million individuals, whereas the figure dwindles to merely 660 million when considering the official residence registration status. The descrepancy primarily stems from urban dwellers who, though permanently residing in urban areas, lack urban household registration, with the "rural-to-urban" migrant population consitituting the bulk of this phenomenon.

The implementation of the residence permit system has significantly enticed individuals to maintain prolonged urban residencies, affording them access to fundamental public services. However, the possession of a local registered residence surpasses this, granting access to a more extensive array of essential public services. Within the confines of China's registered residence system, numerous individuals find themselves going back and forth between urban and rural settings, unable to secure urban household registration, a phenomenon often characterized by "young people migrating out and elderly returning". Moreover, a substantial segment of the floating population persists in cities without a definitive abode or stable employment, potentially precluding them from securing stable living and developmental opportunities due to limitaions imposed by household registration policies, economic constraints, and other factors, thereby prompting frequent mobility across various cities (Zhou Tianyong, 2018).

The current research landscape has overlooked the potential ramifications of household registration thresholds on the settlement intentions of migrant population, with a notable obstacle lying the quantification and assessment of these thresholds. The concept of household registration threshold is multifaceted and posed challenges for straightforward measurement. At present, the most pivotal and direct methodology for assessing these thresholds involves indexing and standardizing the policy documents pertaining to household registration across various cities, thereby enabling cross-city comparative analyses (Zhang Jipeng and Lu Chong, 2019). Accordingly, the primary objective of this study is to devise appropriate proxy variables for the settlement threshold and establish a comprehensive settlement threshold index. This endeavor aims to delve into the implications and underlying mechanisms of the adjustments within the registered residence system, exemplified by the settlement threshold, on the willingness of rural-urban migrants to settle in cities, particularly within the context of the provision of fundamental urban public services.

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2. Materials and Methods

Research Hypothesis

Regarding the migrant population residing in individual "township cities", the determinants influencing the settlement decision are intricate and multifaceted. These factors encompass a broad spectrum of variables that collectively shape the decision-making process.

With the advancement of urbanization, individual's evolving demands and expectation for public welfare associated with urban registered residence have emerged as a pivotal determinant influencing their settlement decision. Notably, the settlement threshold acts as adirect barrier that dictates the eligibility of individuals to acquire registered residence status within a city (Liu Tao et al., 2019). To gain a deeper understanding and articulate the influence of the settlement threshold on the settlement intentions of migrant populations residing in "township cities" amidst adjustments to the registered residence system, this study builds upon extant research (Cl é ment Imbert & Papp, 2020), and assumes that migrant laborers(denoted as *i*) within city *j* are characterized by distinct profiles, with their current satisfaction and loyalty contingent upon the cumulative effect of both monetary and non-monetary benefits:

$$U_{i,\ j,\ t} = u_{i,j,m,t} + u_{i,j,n,t} = (w_{i,\ j,\ t} - c_{i,\ j,\ t}) + (s_{i,\ j,\ t} - mc_{i,\ j,\ t}) \quad (1.1)$$

Among them, $u_{i,j,m,t}$represent the monetary benefits required for individuals to settle in the destination city, determined by wage income $w_{i,\ j,\ t}$and living costs $c_{i,\ j,\ t}$. $u_{i,j,n,t}$represent the non monetary benefits required for individuals to settle in the destination city, determined by the level of urban public services $s_{i,\ j,\ t}$and the attractiveness of the destination city $mc_{i,\ j,\ t}$. According to Friedman's persistent income hypothesis, under the incentive of pursuing utility maximization, consumers will consider future income stability and growth trends to determine an appropriate level of consumption. At this point, the total utility obtained by the rural-urban migrant *i* in the city *j* over the long term is:

$$U_{i,\ j} = \sum_{t=t_0}^{T} \frac{u_{i,j,t}}{(1+\beta_m)^{\ t}} = \sum_{t=t_0}^{T} \frac{(w_{i,\ j,\ t} - c_{i,\ j,\ t})}{(1+\beta_m)^{\ t}} - \frac{c_{t_0,j}}{(1+\beta_m)^{\ T}} + \sum_{t=t_0}^{T} \frac{s_{i,\ j,\ t}}{(1+\beta_i)^t (1+\delta_j^H)} - \frac{mc_{i,\ j,\ t}(1+\delta_j^H)}{(1+\beta_i)^{\ t}} \quad (1.2)$$

Within the context, β represents the comprehensive discount rate, which encapsulates the long-term total utility derived by the floating population residing in “township citites” across varous time periods. Additionally, $c_{t_0,j}$ signifies the initial, one-time cost associated with migrating to city *j*. Wages and living costs are discounted according to the market interest rate β_m, while the discount rate β_i for the level of public services and the attractiveness of the outflow location depends on an individual's emphasis on future long-term development opportunities.

When individuals pay more attention to immediate benefits, they usually pay more attention to the current income level and use monetary income as the main criterion for deciding whether to settle in the destination. In this situation, individuals do not urgently need public services because they are more inclined to pursue immediate material returns, and their demand for long-term welfare is not so urgent. Individuals are not compelled to endure extended periods of absnece from their hometown nor confront the dilema of forsaking their place of origin, thereby incurring a relatively minimal psychological cost. This observation underscores the potential for individuals to maintain stronger emotional ties and reduced psychological burdens associated with migration. At this time, the discount rate β_i between the level of public services and the attractiveness of the outflow location is higher.

On the contrary, when individuals place greater emphasis on future long-term development opportunities, they may consider more the challenges and needs they may face in the future. This awareness prompts individuals to place great emphasis on the long-term benefits conferred by public services, as they come to appreciate the significance of equitable access to such services in shaping their future quality of life. Consequently, their decision-making processes may be influenced by considerations that extend beyond immediate gains, incorporating a broader perspective on the role of public services in enhancing overall well-being. At this time, individuals are facing an increased willingness to settle in the destination after a long period of distance from their hometown, which affects their consumption decisions and life choices, and increases their psychological costs. Thereby,

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the discount rate β_i between the level of public services and the attractiveness of the outflow location is relatively low.

Assuming δ_j^H is the household registration threshold for city j, for individuals, in order to obtain legal identity and enjoy corresponding public services locally, they need to overcome the limitations of the household registration threshold, which are not only formal but also substantive. The restrictions on household registration directly affect the quality of life and welfare level of individuals in the local area. Due to the lack of civic rights, individuals may feel excluded and marginalized, difficult to integrate into local society, and lack a sense of identity and belonging to society. In this context, individuals are compelled to continually endeavor to acclimatize and adapt to the local environment, concurrently confronting the intricate dilemma of potential marginalization and a lack of recognition. This predicament exacerbates the psychological challenges and pressure they experience, necessitating resilience and proactive strategies for navigating social integration and identity formation. The burden of psychological costs affects individuals' quality of life and happiness, making their lives in the local area more difficult and increasing uncertainty.

At this point, the settlement decision of the floating population residing in "township cities" depends on their total utility value $U_{i,\ j}$ in the city. If and only if $U_{i,\ j} \geq 0$, the floating population will choose to settle in city j.

$$prob\left(settle = 1/U_{i,\ j} \geq 0\right) \propto U_{i,\ j} \tag{1.3}$$

Assuming that all other variables constant, an elevation in the threshold for settling in city j occurs. Consequently, while the monetary benefits accuring to the floating population remain stagnant, there is an augmentation in non-monetary benefits. Nevertheless, this transformation results in a decline in the overall utility level, thereby diminishing the likelihood of the floating population opting to reside in city j. Critically, if the non-monetary component of total utility diminishes to an extent that renders the aggregate utility negative, the floating population's dendency to vacate the city intensifies. In such a scenario, augmenting the threshold for household registration could potentially diminish the city's appeal to the floating population, particularly when the advancements in public service standards fail to mitigate the detrimental effects stemming from the overall decrease in utility levels. Based on this, this study posits Hypothesis 1:

Assumption 1: An upward adjustment in the threshold for urban household registration will diminish the non-monetary utility derived by floating population, thereby exerting a crowding-out effect on their settlement intentions.

In addition, employment discrimination emerges as a pivotal mechanism through which the urban settlement threshold exerts influence on the settlement decision of the "township city" migrants. This phenomenon is prominently manifested in the fact that despite possessing equivalent capabilities to urban residents, migrants from "township cities" continue to face restrictions in accessing certain sectors and industries, primarily owing to their lack of local registered residency status (Wu Shanshan, Meng Fanqiang, 2019). This underscores the need for further investigation into the intricate interplay between settlement policies and employment opportunities for this demographic cohort.

In high-threshold cities, the absence of registered residence or corresponding citizenship rights and benifits often hinders "township city" migrants from attaining equivalent employment opportunities and treatment as their urban counterparts. These individuals confront issues encompassing wage disparities, compromised labor rights, and constrained career development, thereby placing them in a disadvantaged stance within the labor market. Consequently, the rural-urban migrants is compelled to contemplate relocating to cities that pose relatively lower barriers for household registration in pursuit of improved employment prospects and developmental avenues. Such migrantory patterns not only impact labor supply dynamics and social stability in their places of origin but also underscore the profound inequalities in employment opportunities distribution and inter-city discrimination. Therefore, Hypothesis 2 is formulated as follows:

Assumption 2: The presence of urban employment discrimination is hypothesized to elevate the likelihood of migrant population migration out of urban areas. Furthermore, it is posited that heightened levels of employment discrimination exacerbate the crowding-out phenomenon, which

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arises from stringent household registration thresholds, thereby intensifying the pressure on migrants to relocate.

As the skill premium intensifies, high-skilled migrants gains heightened competitiveness and bargaining power within the urban labor market. Their specialized knowledge and skills not only contribute to greater production efficiency and innovation capacity within enterprises but also confer and advantageous position in salary negotiations and career advancement. Consequently, this segment of the migrant population often secures relatively superior salary levels and enhanced welfare benefits, as evidenced by Dong Zhiqing et al.(2014). With their increasingly prominent role in China's urban labor market, high-skilled migrants transcend the realm of basic subsistence consumption and attach greater importance to factors such as the working environment, developmental opportunities, and cultural living standards of their destinations, as highlighted by Wang Youxing and Yang Xiaomei(2018). Notably, high-skilled labor exhibits a greater focus on long-term developmental prospects, leading to a lower personal discount rate, signifying a heightened willingness to invest and forgo present benefits for the sake of future long-term advancement. That is to say $\beta_{highi} < \beta_{lowi}$.

On the other hand, real estate constitutes a pivotal asset for families to mitigate potential future risks. As the barriers for urban household registration secalate, high-skilled labor without housing becomes increasingly sensitive to employment discrimination in the job market, which directly undermines their quality of life and future development prospects, thereby exacerbating their psychological and economic burdens In contrast, while low-skilled labor may also experience the reprecussions of heightened household registration thresholds, their utility losses are comparatively muted owing to their diminished demand for long-term developmental opportunities. This demographic tends to prioritize fundamental survival concerns and short-term income stability, rendering the impact of employment discrimination relatively mild. This indicates that$|\Delta\beta_{highi} > \Delta\beta_{lowi}|(\Delta\beta_{highi}\Delta > 0, \Delta\beta_{lowi}\Delta < 0)$.

Therefore, hypothesis 3 is proposed:

Assumption 3: The secalation of the threshold for urban household registration exerts a pronounced negative impact on the settlement intentions of high-skilled labor without housing. Notably, the exacerbating effect of employment discrimination becomes even more salient within this specific gemographic cohort of high-skilled "rural-urban" migrants who lack housing, significantly hindering their willingness to establish permanent residency.

Model Construction

Based on the aforementioned theoretical framework and research hypotheses, an econometric model has been formulated. Given the dichotmous nature of the explanatory variable, namely the "rural-urban" floating population's willingness to settle, both Ordinary Least Squares (OLS) and Probit models were employed for benchmark regression estimation. A comparative analysis of the regression outcomes from these two estimation methodologies was conducted to enhance the robustness and reliability of the estimated results. The specific OLS and Probit model settings are shown in equations (1.4) and (1.5):

$$S_{ij} = \alpha_0 + \alpha_1 * OR_j + \alpha_2 * X_{ij} + \delta_j + \varepsilon_{ij} \tag{1.4}$$

$$Pr\left(S_{ij} = (OR_j, X_{ij}\right) = F(OR_j, \alpha_1)\frac{exp\left(\alpha_0+\alpha_1*OR_j+\alpha_2*X_{ij}+\delta_j+\varepsilon_{ij}\right)}{1+exp\left(\alpha_0+\alpha_1*OR_j+\alpha_2*X_{ij}+\delta_j+\varepsilon_{ij}\right)} \tag{1.5}$$

Within the model, a binary variable $S_{ij}$is incorporated, signifying the willingness of individual *i* to settle in the destination *j*. Additionally, the household registration threshold index of city j is represented by OR_j,. The primary focus of this study revolved around the significance and direction (positive or negative) of the relationship coefficient associated with α_1 as the core explanatory variable. Specifically, a negative coefficient for OR_j, would imply that an increase in urban household registration threshold exerts a dempening effect on the settlement intentions of the "rural-urban" migrants. Furthermore, a set of relevant control variables, denoted by X_{ij}, are included to comprehensively account for potential confounding factors. By thoroughly controlling for these variables, the endogeneity issue pertaining to the urban settlement threshold is effectively mitigaed,

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thereby enabling the identification strategy employed in this study to precisely identify the impact of the urban settlement threshold. Lastly, δ_j represents the fixed effect at the urban level, capturing unobserved heterogeneity across cities, while ε_{ij} denotes the random disturbance term, accounting for any remaining variability not captured by the model.

Data and Variable Explanation

The raw data used in this study mainly consists of both macro and micro data. Firstly, regarding the dependent variable, since only the CMDS2017 data in the public database includes surveys on individual household registration intentions, we have chosen the relevant question from the CMDS2017 survey: "If the local household registration conditions are met, are you willing to move your household registration to the local area?" Based on this question, construct corresponding binary variables and mark the answer "willing" as 1, while other answers are marked as 0. The construction of this variable can better understand and analyze individuals' willingness to move into their local household registration.

For the core explanatory variables, relevant years' urban statistical yearbooks, urban socio-economic development bulletins, policy databases, and other data are used to construct the household registration threshold index. Relevant research shows that at present, the registered residence population mainly flows to municipalities directly under the Central Government, provincial capital cities and prefecture level cities, so urban sample selection needs to consider the difference in coverage and development level. In combination with the number and content of settlement documents issued by various regions, a total of 36 cities, including 4 municipalities directly under the Central Government, 5 cities specifically designated in the plan and 27 provincial capital cities, are finally selected as research samples to construct the settlement threshold index. The population and regional distribution of the sample cities in 2017 are shown in Table 1.

Table 1. Basic situation of sample cities included in this study in 2017.

category	city	Province (Region, City)	Total urban population	Total population of	Regional distribution
municipality directly under the Central Government	Beijing	Beijing	2154	1865	North China
	Shanghai	Shanghai	2428	2428.14	East China
	Tianjin	Tianjin	1562	1303.84	North China
	Chongqing	Chongqing	3124	1185.6	southwest
provincial capital	Guangzhou	Guangdong	1530.59	683.14	south China
	Hangzhou	Zhejiang	1036	396.17	East China
	Wuhan	Hubei Province	1121.2	623.3	Central China
	Chengdu	Sichuan	1658.1	746.22	southwest
	Nanjing	Jiangsu	850	634.84	East China
	Shenyang	Liaoning	832.2	445.26	northeast
	Changsha	Hunan	839.45	384.75	Central China

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	Shijiazhuang	Hebei Province	1103.12	332.32	North China
	Zhengzhou	Henan	1035.2	404.25	Central China
	Jinan	Shandong	890.87	435.59	East China
	Harbin	Heilongjiang Province	1076.3	415.18	northeast
	Changchun	Jilin	753.8	359.24	northeast
	Xi'an	Shaanxi	1020.35	624.81	northwest
	Fuzhou	Fujian	780	235.47	south China
	Hefei	Anhui Province	818.9	234.48	East China
	Nanchang	Jiangxi	560.06	256.79	Central China
	Kunming	Yunnan	695	402.35	southwest
	Hohhot	InnerMongoliaAutonomousRegion	313.7	140	North China
	Nanning	GuangxiZhuangAutonomousRegion	734.48	241.47	south China
	Taiyuan	Shanxi	446.19	299.85	North China
	Urumqi	Xinjiang	355.2	226.82	northwest
	Guiyang	Guizhou	497.14	216.72	southwest
	Lanzhou	GansuProvince	379.09	196.12	northwest
	Xining	Qinghai	238.71	126.89	northwest
	Haikou	Hainan	232.79	120.8	south China
	Yinchuan	NingxiaHuiAutonomousRegion	229.31	109.97	northwest
	Lhasa	Xizang	72.07	31.95	southwest
Planned single city	Dalian	Liaoning	700.2	404.67	northeast
	Qingdao	Shandong	949.98	417.87	East China
	Ningbo	Zhejiang	854.2	212.55	East China
	Xiamen	Fujian	429	226.01	south China
	Shenzhen	Guangdong	1343.88	1343.88	south China

Data source: "2018 China Urban Statistical Yearbook".

In terms of constructing the household registration index, the prevailing urban household registration system in China can be fundamentally categorized into two primary frameworks: the admission system and the points-based system. The admission system, specifically, outlines a set of requirements or benchmarks that individuals must fulfill in order to secure urban household

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registration status. These prerequisites commonly encompass stipulations pertaining to educational attainment, professional experience, social security contributions, and various other factors. Notably, in recent years, the talent introduction policy has garnered significant favor among major urban centers, with the intensification of "talent wars" manifesting the diverse institutional approaches employed by cities at different tiers in facilitating the settlement of skilled personnel.

The points-based system has emerged as a major household registration policy in recent times, predominantly implemented in superlarge cities and megacities. This system generally imposes a higher threshold for eligibility compared to the traditional admission system. In order to secure settlement, individuals are required to accumulate a specific threshold of points, which are primarily derived from factors such as age, educational attainment, years of social security contributions, and continuous residence periods. Both systems possess inherent strengths and limitations; the admission system offers clarity but may encompass overly stringent criteria, whereas the points-based system affords greater flexibility, albeit its susceptibility to potential human biases and subjectivity.

To quantitatively assess the settlement threshold index, this study formulates an evaluation system grounded in 4 primary indicators: residential settlement, employment settlement, investment settlement and household registration settlement, alongside 8 secondary indicators and 23 tertiary indicators. The rationale underlying this approach is that a lower settlement threshold index signifies a higher degree of openness in the registered residence registration system, thereby facilitating increased accessibility and integration for individuals.

In the context of migration and urbanization studies, "residential settlement" denotes the acquisition of settlement eligibility predicated upon maintaining a legal and enduring domicile within the local jurisdiction, constituting a fundamental prerequisite for gaining registered residence status. This construct encompasses two distinct three-tiered indices: rental settlement, pertaining to residency secured through leasing arrangements, and home purchase settlement, involving the acquisition of property as a means of establishing residency.

Furthermore, "Employment settlement" signifies the attainment of settlement eligibility based on secureing legal and stable employment opportunities within the local area, which likewise serves as a comerstone for abtaining registered residence. Within the framework of "employment and household registration", two primary secondary indicators are identified: ordinary employment, encompassing a broad spectrum of vocational pursuits, and talent introduction, specifically targeting the recruitment of skilled professionals and experts.

Additionally, 'Investment settlement' refers to process of acquiring settlement rights through local investments or the establishment of businesses, thereby facilitating economic integration and contributing to the local economy.

Lastly,"household registration settlement" via family reunification involes obtaining settlement eligibility by virtue of joining relatives who already possess local registerd residence. This category encompasses three secondary indicators: conjugal reunion, where spouses unite; filial reunion, involving the joining parents with their offspring; and progeny renunion, where children are reunited with their parents or guardions. Each of these pathways underscores the multifaceted nature of settlement processes and their intricate interplay with social, economic, and demographic factors.

The evaluation framework pertaining to China's urban household registration threshold index is outlined in Table 2. Given the constraints of space within this document, the exhaustive methodology for rule calculation has been omitted.

In terms of indicator calculation, this study uses x_i as the i-th single indicator (i=1, 2, 3, 4) that constitutes the secondary index x, representing four secondary indices: residential settlement index, employment settlement index, investment settlement index, and household registration settlement index. To eliminate the influence of different measurement units between indicators and ensure the horizontal comparability of index results, a dimensionless method is adopted to uniformly process the indicators.

For linear indicators such as purchase amount and investment amount, the per capita GDP is adjusted and then the extreme value method is used to standardize the data of each indicator, projecting it onto the interval [0,1]. The calculation equation is as follows:

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$$x_{ij}^{'} = \frac{[\frac{x_{ij}}{GDP_{ij}} - min\frac{x_{ij}}{GDP_{ij}}]}{max\frac{x_{ij}}{GDP_{ij}} - min\frac{x_{ij}}{GDP_{ij}}} \quad (1.6)$$

Among them, x_{ij} represents the raw data of the jth city in the i-th single indicator of the secondary indicator x, GDP_j is the per capita GDP of the city j, $min\frac{x_{ij}}{GDP_{ij}}$ is the minimum value of the indicator, $max\frac{x_{ij}}{GDP_{ij}}$ is the maximum value of the indicator, and the standardized data is obtained after processing. Score non-linear indicators such as educational background, professional skills, and job title requirements by setting classification criteria.

Table 2. Evaluation System of China's Urban Settlement Threshold Index.

First level indicator	Second level indicator	Third level indicator
Residential Settlement Index	Purchase and household registration index	Purchase amount Requirements for social security payment Other requirements
	Rental settlement index	Residence duration Requirements for social security payment Other requirements
Employment and household registration index	General Employment Index	Tax amount Requirements for social security payment Age requirement Other requirements Educational background
	Talent Introduction Index	Requirements for social security payment Age requirement Other requirements
Investment Settlement Index	Investment Settlement Index	Investment amount Requirements for operating years Other requirements
Joining the household registration index	Marriage household registration index	Marriage age requirement Other requirements
	Children's household registration index	Age requirement Other requirements
	Parental household registration index	Age requirement Other requirements

Note: The weight of the evaluation system is calculated using a combination of Delphi method and Analytic Hierarchy Process; The evaluation basis comes from the magic weapon of Peking University and the registered residence policy information published on the official websites of local governments.

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Ultimately, the urban settlement threshold index evaluation system is employed to assess and quantify the registered residence policies of sample cities, culminating in a definitive ranking presented in Table 3. The specific scores reveal in this table underscore the stringent ontrol over registered residence in metropolises such as Beijing, Shanghai, Guangzhou and Shenzhen. Notably, Beijing emerges as the city with the most stringent settlement threshold, with an index score of 0.95, surpassing all other sampled cities. Shanghai follows closely behind with a settlement threshold index of 0.776, ranking second, while Shenzhen, Guangzhou and Tianjin occupy subsequent positions in the ranking.

Among the municipalities directly administered by the Central Government, Chongqing ranks 22nd, exhibiting a relatively low threshold for settlement. This positioning can be attributed to city's poineering efforts since 2010 as a pilot region for comprehensive reform aimed at balancing urban and rural development. Chongqing has embarked on reforming its registered residence system, primarily targeting migrant workers, and has progressively established an open framework that encompasses relaxed access conditions for settlement alongside a rational system for safeguarding urban and rural interests.

Table 3. Ranking of household registration threshold index in sample cities.

City	Region	Geographic Distribution	Total Urban Population (Thousands of people)	Settlement Threshold Index
Beijing	Beijing	North	1865	0.95
Shanghai	Shanghai	East	2428.14	0.776
Shenzhen	Guangdong	South	1343.88	0.626
Guangzhou	Guangdong	South	683.14	0.599
Tianjin	Tianjin	North	1303.84	0.487
Xiamen	Fujian	South	226.01	0.465
Chengdu	Sichuan	Southwest	746.22	0.428
Hangzhou	Zhejiang	East	396.17	0.395
Wuhan	Hubei	Central	623.3	0.369
Dalian	Liaoning	Northeast	404.67	0.277
Nanjing	Jiangsu	East	634.84	0.253
Ningbo	Zhejiang	East	212.55	0.217
Kunming	Yunnan	Southwest	402.35	0.188
Haikou	Hainan	South	120.8	0.155
Chongqing	Chongqing	Southwest	1185.6	0.152
Urumqi	Xinjiang	Northwest	226.82	0.148
Lhasa	Tibet	Southwest	31.95	0.137
Lanzhou	Gansu	Northwest	196.12	0.134
Hefei	Anhui	East	234.48	0.13
Qingdao	Shandong	East	417.87	0.126

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Changsha	Hunan	Central	384.75	0.126
Shenyang	Liaoning	Northeast	445.26	0.119
Yinchuan	Ningxia	Northeast	109.97	0.114
Xining	Qinghai	Northeast	126.89	0.088
Xi'an	Shaanxi	Northeast	624.81	0.087
Changchun	Jilin	Northeast	359.24	0.085
Zhengzhou	Henan	Central	404.25	0.077
Harbin	Heilongjiang	Northeast	415.18	0.058
Taiyuan	Shanxi	North	299.85	0.055
Guiyang	Guizhou	Southwest	216.72	0.049
Shijiazhuang	Hebei	North	332.32	0.026
Nanning	Guangxi	South	241.47	0.026
Hohhot	Inner Mongolia	North	140	0.017
Jinan	Shandong	East	435.59	0.017
Fuzhou	Fujian	South	235.47	0.011
Nanchang	Jiangxi	Central	256.79	0.008

Note: The data is sourced from the 2018 China Urban Statistical Yearbook, and the total urban population is based on data from 2017.

In selecting control variables, a meticulous approach was undertaken to ensure the reliability and precision of research outcomes. Specifically, individual-level variables that exhibit a high degree of correlation with the threshold of the registered residence system were included, as they bolster the robustness of the analysis. Additionally, urban economic development characteristics, which are intimately linked to urban registered residence policies, were aggregated and harmonized with the 2017 CMDS sample, serving as a crucial control variable. This strategy aimed to meticulously control for other confounding factors, thereby facilitating a more precise assessment of influence of the household registration threshold on the migrant population's settlement intentions. Consequently, the credibility and scientific rigor of the research conclusions were enhanced.

It should be noted that in the context of assessing the cost of living, disparities in the perception and preferences of individuals towards housing prices across diverse regions emerge as a salient factor. This heterogeneity, in turn, can significantly influence the residential choices made by migrants, as they navigate the varying impact of regional housing prices. Consequently, when delving into the analysis of housing cost utility, it becomes paramount to account for differential effects of housing price levels across regions, thereby fostering a more nuanced comprehension of the settlement decisions undertaken by the floating population. Previous studies, such as those conducted by Wu Xiaoyu et al. (2014) and Zhang Li et al. (2017), have employed absolute housing prices as a metric to gauge the general affordability challenges faced by urban laborers in acquiring housing. However, it is crucial to recognize that the utilization of urban absolute housing prices alone falls short of comprehensively capturing the intricacies of housing affordability for the sampled

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migrants within urban settings. This limitation underscores the need to address the attendant issues and adopt a more nuanced approach that acknowledges the heterogeneity in housing price impacts across regions.

Departing from extant research, the present study adopts an individual-centric approach to housing affordability and introduces the notion of relative housing prices as a refined metric. This concept endeavors to offer a more precise assessment of challenges associated with house purchasing by taking into account not merely the absolute housing price levels but also the personal income dynamicsof respondents. Specifically, relative housing price is defined as the ratio between the average housing price and respondents' monthly personal income, thereby allowing for a nuanced evaluation of individual affordability with respect to housing acquisition.

The computation of the average housing price relies on comprehensive data encompassing total sales volumes and sales areas of residential properties in prefecture-level cities, sourced from the CEIC China Economic Database. Complementary to this, individual monthly income data is sourced from the 2017 CMDS database. To facilitate statistical analysis, the logarithm of relative housing prices is employed in the regression model. Moreover, in line with the research objectives, the target sample is deliberately constrained to rural-urban migrants. Following rigorous data matching and filtering prodedures, a refined dataset of 66,123 valid samples was attained, ensuring the representativenss and relevance of the findings to the targeted population.

Table 4. Descriptive statistics.

Variable			N	Mean	Std	Min	Max
Explained variable		settlement intention	66123	0.42	0.49	0	1
Core explanatory variable		Residence Threshold Index	66123	0.71	0.28	0.08	0.95
Control variable	Individual level	Gender	66123	0.51	0.50	0	1
		Age	66123	36.90	10.56	16	97
		Marital	66123	0.16	0.37	0	1
		Education	66123	3.35	1.07	1	7
		Ethnic	66123	0.91	0.28	0	1
		Property	55133	6.16	2.61	1	12
		Income_P	55133	4355.29	3590.35	0	100000
		Range	66123	1.56	0.66	1	3
		Duration	66123	7.08	5.93	1	65
		Reason	66123	2.20	4.45	1	32
		Time	66123	1.94	1.83	1	80
	Family level	Income_F	66119	7212.92	5537.00	0	200000
		Income_E	66121	3747.40	2912.15	50	100000

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	Monthly household expenditure	66123	918.82	1216.83	0	50000
	Families to live with	66123	3.11	1.18	1	10
	housing	23785	0.58	0.49	0	1
City level	Child education	36437	0.35	0.48	0	1
	Medical	66123	0.01	0.11	0	1
	Social security	66123	0.48	0.50	0	1
	GDP	66123	98760.70	30550.96	54808	183544
	Tertiary	66123	59.00	9.42	44.395	80.605
	density	66123	757.69	549.54	18	2276
	Growth	66123	3.01	7.40	-8.76	25.18
	Employees	66123	57.90	11.13	37.46	82.09
	Health centers	66123	294.98	211.28	28	888
	Fixed assets	66123	66100000	44700000	6018121	18200000
	Wage	66123	23500000.	28000000.	1414643	10200000
	Working staff	66123	227.07	202.70	12	754
	Expenditure	66123	22000000	22700000	1983183	75500000
	Revenue	66123	16500000	19000000	791623	66400000
	Price	53340	1.12	0.70	-2.38	5.056
	Education spending	66123	3031476	2874441	315243	9645817
	RD Staff	64540	1116354	106511	219	397281
	College students	66123	543.69	211.46	233	1005
	Average house price	64547	18692.6	16448.3	5223	58064

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3. Results

Benchmark Regression

Table 5 presents the impact of urban household registration thresholds on the settlement intention of rural-urban migrants. In models m1 and m4 of Table 5, no control variables were introduced. At this point, the regression results show that the coefficient of the urban household registration threshold is negative and statistically significant at the 1% level. The regression results without introducing control variables more directly demonstrate the impact of urban household registration threshold on the settlement intention of migrants. On this basis, models m2 and m5 introduce control for individual, household, and urban characteristic variables in the inflow area. At this time, the threshold for urban household registration still has a significant negative impact on the settlement intention of rural-urban migrants.

This result indicates that even considering other variables at the individual, household, and urban levels, the increase in the threshold for urban household registration still significantly reduces the settlement intention of the migrants. In models m3 and m6, while controlling for urban fixed effects, the results still show a negative impact of the urban settlement threshold on the s settlement intention of rural-urban migranta. This conclusion is statistically significant even after excluding potential omitted variables at the individual, household, and urban levels. Based on the regression results of various models, it can be found that as the threshold for urban household registration increases, the settlement intention of migrants shows a gradually decreasing trend, which is consistent with the expected results of hypothesis 1 in this study.

Table 5. The regression results of threshold and intention of settling down.

Variable	Explained variable: the settlement intention of rural-urban migrants					
	ols			probit		
	m1	m2	m3	m4	m5	m6
Residence Threshold Index	-0.466***	-0.409***	-0.409***	-1.217***	-1.150***	-1.150***
	(-70.56)	(-7.18)	(-6.93)	(-66.94)	(-7.02)	(-6.98)
Individual level control variables	No	Yes	Yes	No	Yes	Yes
Control variables at household level	No	Yes	Yes	No	Yes	Yes
City-level control variables	No	Yes	Yes	No	Yes	Yes
City fixed effects	No	No	Yes	No	No	Yes
Constant	0.748***	-2.269***	-2.269***	0.648***	-7.515***	-7.515***
	（-148.79）	(-2.98)	(-2.89)	（-47.1）	(-3.43)	(-3.44)
N	66，123	7，874	7，874	66，123	7，874	7，874

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R2 / Pseudo R2	0.07	0.125	0.125	0.0517	0.0964	0.0964

z-statistics in parentheses *** p<0.01，** p<0.05，* p<0.1.

Endogenous Problems

There is a certain degree of correlation between the household registration threshold represented by the urban household registration threshold index in benchmark regression and the household registration intention of the rural-urban migrants, but this correlation lacks independence and exogeneity. Firstly, there may be a causal relationship between the threshold for urban household registration and the settlement intention of rural-urban migrants. On the one hand, when setting the threshold for household registration, cities need to consider the settlement intention of "township city" floating population, and raising the threshold for household registration in the destination will reduce the settlement intention. On the other hand, the increase in thesettlement intention in the destination will also affect the formulation of household registration policies. There may already be various differences between cities with low and high settlement intentions. There is a correlation between increasing and decreasing the threshold for settling, and it cannot be accurately inferred that lowering the threshold has reduced the settlement intention. This may be due to the natural environment, public services, political status and other resource endowments of the province where the low willingness to settle is located. Cities with high threshold for settling often have strong economic strength, concentrated industrial distribution, and perfect public services, and have a stronger ability to absorb non local populations.

Therefore, the threshold for urban household registration may be influenced by various internal factors during the formulation and adjustment process, making the relationship between the threshold index and the settlement intention of rural-urban migrants complex and ambiguous. This endogeneity issue makes it difficult to simply consider the urban household registration threshold index as a single factor to explain the household registration choices of the migrants. Secondly, there may be omitted variables that affect the threshold index for urban household registration and the willingness of rural-urban migrants, which may potentially impact the formulation and implementation of urban household registration policies, and thus affect the choice behavior of migrant population. In addition, the threshold index for urban household registration is quantified based on the provisions of urban documents, and there are problems such as missing original policy documents (Zhang Jipeng, 2020).

In response to potential endogeneity issues, this study utilized the instrumental variable method to address them. Following the research approach of Acemoglu et al. (2001), the 1997 grain production was selected as the instrumental variable for the urban settlement threshold index. The rationality of using 1997 grain production as an instrumental variable for urban household registration threshold needs to meet two important conditions.

Firstly, the instrumental variable must be related to the dependent variable (urban household registration threshold). In this case, the 1997 grain production must be able to influence changes in the threshold for urban household registration, ensuring that the instrumental variables are correlated with the causal relationship of the research focus. If there is a direct or indirect correlation between grain production and the threshold for urban settlement, then this instrumental variable can be considered a reasonable tool.

Secondly, instrumental variables must be independent of other influencing factors beyond the dependent variable. That is to say, the impact of grain production in 1997 on the threshold for urban household registration cannot be related to factors outside the threshold through other means. This independence ensures that the instrumental variables satisfy the exogeneity assumption of the instrumental variables, which can be used to alleviate endogeneity issues.

When using the 1997 grain production as an instrumental variable for urban household registration threshold, it is necessary to ensure that it meets the above two conditions to ensure the effectiveness and rationality of the instrumental variable. Only in this way can we effectively use

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instrumental variable methods to study the impact of urban settlement thresholds on the willingness of rural-urban migrants, and thus draw accurate and reliable conclusions.

On the one hand, the argument for the correlation between historical grain production and household registration thresholds can be understood by analyzing the impact of historical grain production on urban development, population migration, and government policies. Cai Fang et al. (2001) found that there was a significant correlation between the planned migration population of each city from 1952 to 1998 and the per capita grain production of the previous year.

This means that a city's food production largely determines its population carrying capacity. The grain output of the city not only reflects the level of local agricultural production, but also directly affects the threshold of registered residence of the city. Although its influence will weaken with the increase of time span, part of the influence will continue. The abundance of grain production may directly affect the growth and distribution patterns of urban population, thereby influencing the government's policy-making in urban planning and management. These policies may include the establishment of urban residency thresholds, which are government requirements and restrictions on the settlement of migrants in cities. Abundant grain production usually attracts more population into cities, as they provide more employment opportunities and living conditions. This population mobility may lead to population growth and structural changes in cities, thereby affecting the government's thinking and implementation of urban household registration policies. The government may adjust the threshold for urban household registration based on changes in urban population and demand, in order to maintain social order and economic stability in the city.

On the other hand, the exogeneity of instrumental variables requires that historical grain production has no direct correlation with the settlement intention of rural-urban migrants. The per capita grain production in 1997 contained some exogenous natural factors, such as geographical conditions, which would not directly affect the household registration decisions of the rural-urban migrants in recent years. It could only affect the household registration threshold and thus affect the willingness to settle, resulting in strong exogeneity.

The regression results of the instrumental variables of household registration threshold and household registration intention are shown in Table 6. Models m1 to m4 are the regression results of 2SLS and IV Probit using 1997 grain production as the instrumental variable. In the first stage regression, the dependent variable is the urban household registration threshold. At this time, the 1997 grain production in the city is positively correlated with the current household registration threshold, and the F-value of the first stage regression is much greater than 10, with Prob>F=0.0000, which satisfies the correlation hypothesis of instrumental variables and indicates that there is no weak instrumental variable problem.

The p-values in both Durbin test and Wu Hausman test are greater than 0.1. In the second stage regression, the dependent variable is the settlement intention of migrants. At this point, the estimated results indicate that after using the 1997 grain production as an instrumental variable, the impact of the household registration threshold on the willingness of the rural-urban migrants is still statistically significant at the 1% level.

After using instrumental variables to alleviate endogeneity issues, the marginal effect of household registration threshold on household registration intention was -1.983, slightly higher than the basic regression results. Compared with the regression results of the OLS and Probit models that include individual, household, and city level control variables, the impact of the estimated urban household registration threshold index using IV Probit on individual household registration intention is still significant, indicating that the increase in household registration threshold has a crowding out effect on the household registration intention of the rural-urban migrants. Hypothesis 1 still holds true.

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Table 6. Estimation results of instrumental variables of threshold and willingness to settle.

	2SLS		IV-Probit	
Variable	m1	m2	m3	m4
First stage regression	Explained variable: Hukou threshold			
IV(Per capita food production in 1997)	0.0687***		0.0687***	
	0.00064		0.00064	
F Value	135.67		146.83	
Second stage regression	Explained variable: the settlement intention of rural-urban migrants			
Settlement threshold		（0.07379**		-1.983***
		0.0534		0.1479
Constant		2.6225***		5.6703***
		0.57910		1.5951
Urban control variable	Yes	Yes	Yes	Yes
Household control variable	Yes	Yes	Yes	Yes
Individual control variable	Yes	Yes	Yes	Yes
Urban fixed effect	Yes	Yes	Yes	Yes
AR		179.56***		189.42 ***
Wald		179.63***		190.42***
Durbin		34.57		41.30
Wu-Hausman		34.58		41.40
N	40，854	40，855	40，856	40，857
R-squared	0.9155		0.9155	

z-statistics in parentheses *** p<0.01，** p<0.05，* p<0.1.

Robustness test

In Table 6, the second stage regression of instrumental variables shows a negative relationship between the threshold for household registration and household registration intention. However, the model has certain difficulties in simulating the process of generating household registration intention among the rural-urban migrants, and the regression results may still be unstable. To verify the robustness of the regression results, this study distinguished the range of migration and changed the sample size. The results still confirmed the conclusion of the benchmark regression, that is, the increase in the threshold for urban household registration has a significant negative impact on the willingness of rural-urban migrant population to settle.

Firstly, the robustness test for distinguishing the flow range. The CMDS 2017 data covers the mobility range of the sample individuals. This study subdivided the sample based on whether the mobility range is inter provincial mobility, which better reflects the trade-off between benefits and risks in the choice of settlement for rural urban migrant population. The regression results of the sub

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samples given in table 7 indicate that the core dependent variable still maintains a high level of significance, consistent with the baseline regression results.

Table 7. Robustness test results to distinguish flow ranges.

Variable	Explained variable: the settlement intention of rural-urban migrants			
	2SLS		IV-Probit	
	Cross-province	Non-trans-provincial	Cross-province	Non-trans-provincial
	m1	m2	m3	m4
Settlement threshold	-0.4867***	-0.8894***	-1.319***	-2.393***
	0.0674	0.1065	0.1901	0.2942
Urban control variable	Yes	Yes	Yes	Yes
Household control variable	Yes	Yes	Yes	Yes
Individual control variable	Yes	Yes	Yes	Yes
Urban fixed effect	Yes	Yes	Yes	Yes
Constant	-0.142***	4.225***	-1.776***	9.9420***
	0.7312	0.9879	2.0508	2.7184
N	21974	18880	21974	18880

z-statistics in parentheses *** p<0.01，** p<0.05，* p<0.1.

Secondly, replace the sample size test. Specifically, three methods of data extraction are used: deleting samples that have not been clearly selected, selecting samples of working age, and selecting samples of the new generation. Firstly, delete samples that have not made clear choices. In the previous benchmark regression, the selection method for whether the dependent variable is willing to move into the household registration was to assign a value of 1 for willingness and 0 for both unwillingness and uncertainty. After data cleaning, the total sample size was 66123, of which 16758 were selected as "not well thought out", accounting for 25.34% of the total sample size. This indicates that about a quarter of the floating population is still hesitating about whether to stay or leave their destination, and has not made a clear decision.

Considering that the settlement intention of the migrants may have a certain impact on the regression results, in order to ensure the reliability of the results, samples that were selected as "not well thought out" were excluded, and regression analysis was only conducted on the "rural-urban" floating population who chose "willing" and "unwilling", in order to more accurately evaluate the impact of urban settlement thresholds on the settlement intention of the migrants and improve the credibility of the research results. Secondly, the rural-urban migrants aged 55 and below are the main force in the household based migrant population. Therefore, the migrants aged 16-55 were selected as the sample for regression analysis. Thirdly, as a representative group of the new generation of rural-urban migrants, the post-80s and post-90s generations are selected for regression analysis. The regression results of both 2SLS and IV Probit models show that increasing the threshold for household registration will reduce settlement intention, indicating that the conclusions obtained from the benchmark model in the previous section are robust.

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Table 8. Robustness test results of replacement sample size.

Variable	Explained variable: the settlement intention of rural-urban migrants					
	Remove samples without a clear decision		Sample of working age 16-55 years		Age group samples from 80 to 90	
	2SLS	IV-Probit	2SLS	IV-Probit	2SLS	IV-Probit
	m1	m2	m3	m4	m5	m6
Settlement threshold	-0.123***	-1.431**	-0.4793***	-0.438***	-0.7597**	-2.643**
	（0.9472）	（0.1894）	（0.0949）	（0.593）	（0.9091）	（0.4052）
Urban characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Family characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Constant	5.6965***	6.1202***	9.725***	1.776***	3.4701**	2.756***
	（0.8126）	（0.1335）	（0.5358）	（2.051）	（0.9224）	（0.8924）
N	5855	5855	5669	5669	2500	2500

z-statistics in parentheses *** p<0.01，** p<0.05，* p<0.1.

4. Discussion

Mechanism analysis

The impact mechanism of urban household registration threshold on the settlement intention of rural-urban migrants is relatively complex, and this study believes that one important impact mechanism is employment discrimination. The increase in the threshold for urban household registration may lead to intensified discrimination against migrant populations in cities, thereby affecting their willingness to settle down. Due to the existence of household registration thresholds, migrant populations may face higher employment difficulties and lower social status, which may lead to discrimination and exclusion against them by urban residents. This discrimination not only affects the quality of life of migrant populations, but also their sense of identity and belonging to the city, which in turn affects whether they choose to settle in the city. In addition, the threshold for urban household registration may also affect the employment opportunities of migrant workers in the city. Due to the existence of barriers, migrant workers may face more employment restrictions and uncertainties, and can only engage in low skilled, low paying jobs, unable to fully unleash their potential and abilities. This employment discrimination will affect the retention rate of migrant population in the city.

On the basis of Zhang Li et al. (2016), this study measures employment discrimination by using the ownership type of employment units for rural-urban migrants, mainly reflecting the

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opportunities for the migrants to enter units within the system. Among them, the units within the system include party and government organs, state-owned enterprises and institutions, and collective units, while the units outside the system include individual private enterprises, foreign-funded joint ventures, etc. Specifically, if the rural-urban migrants are currently employed within the system, it is assigned a value of 1; otherwise, it is assigned a value of 0.

As evident from Table 9, upon adjusting for confounding variables, rural-urban migrant households experiencing higher levels of employment discrimination exhibit a heightened tendency to relocate both out of and into their originating cities, in contrast to those facing lower levels of such discrimination. Furthermore, the negative interaction between the threshold for household registration and the degree of employment discrimination underscore that an escalation in employment discrimination within the residential locale of the rural-urban migrants amplifies the suppressive influence of the household registration threshold on their settlement intentions. This finding lends credence to hypothesis 2, which posits that employment discrimination exacerbates the crowding-out effect of urban household registration threshold on settlement willingness of rural-urban migrants

Table 9. Hukou threshold and hukou intention: Mechanism analysis of employment discrimination.

Variable	Explained variable: the settlement intention of rural-urban migrants			
	OLS	Probit	2SLS	IV-Probit
	m1	m2	m3	m4
Settlement threshold	-0.4808***	-1.3004***	-0.7871***	-2.0956***
	（0.0285）	（0.0792）	（0.0594）	（0.1632）
Settlement threshold # Employment discrimination	-0.0237*	-0.0079*	-0.0493*	-0.0585***
	（0.0348）	（0.1067）	（0.0351）	（0.1076）
Employment discrimination（Within the system =1）	0.0089*	0.0739	0.0085*	0.0283**
	（0.02516）	（0.0802）	（0.0254）	（0 .0807）
Urban control variable	Yes	Yes	Yes	Yes
Household control variable	Yes	Yes	Yes	Yes
Individual control variable	Yes	Yes	Yes	Yes
Urban fixed effect	Yes	Yes	Yes	Yes
Constant	0.3631	-1.0758***	3.4385***	6.9154***
	（0.3722）	（1.0246）	（0 .6421	（1.7632）
N	30362	30362	30362	30362
Pseudo/R-squared	0.1067	0.0837	0.1033	0.9205

z-statistics in parentheses *** p<0.01，** p<0.05，* p<0.1.

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Heterogeneity Analysis

Real estate, as a significant household capital, also has a significant impact on the settlement decisions of rural-urban migrants. Table 10 reports the heterogeneous effects of settlement thresholds on the settlement decisions of the migrants with and without housing in the local area. The regression analysis of housing heterogeneity in Table 10 shows a significant heterogeneity in the impact of household registration thresholds on both households with and without housing among the migrants.

For families with houses, it is easier to meet the urban household registration requirements, and the purchased housing has a certain locking effect on labor families, while also increasing their willingness to settle in the destination. Therefore, the migrant population from rural to urban areas who have houses locally have a higher willingness to settle down. This phenomenon to some extent reflects the impact of housing on individual decision-making and behavior. Purchased housing means that the family has already solved the housing problem in the destination and has stable living conditions. This stability will make them more inclined to stay in the current city, avoiding frequent moves and housing adjustments, thereby reducing their mobility. In addition, purchasing housing also means that they have established social relationships and living circles in the local area, making it easier for them to integrate into the local society, enjoy various services and resources provided by the city, and further reduce their mobility. The purchased housing also provides them with opportunities for asset preservation and appreciation, making them more willing to stay in the local area, participate in urban development, and achieve long-term personal and family development goals (Foote, 2016).

For families without a house, the increase in the threshold for household registration increases the monetization cost of labor families, reduces disposable income, and puts certain pressure on the family economy. The expanding effect of employment discrimination is more pronounced for the migrant population without housing. In contrast, families without homes may encounter greater difficulties when facing the increased household registration threshold. Due to the lack of stable housing conditions, these families may face higher thresholds and restrictions when settling down locally, such as financial proof, rental requirements, etc. Combined with the catalysis of employment discrimination, they face more economic pressure and life uncertainty, making it difficult to meet the residency requirements in the city, which in turn affects their quality of life and developmental opportunities in the city.

At the same time, due to the certain correlation between the conditions for household registration and the conditions for purchasing a house, raising the threshold for household registration will also reduce the possibility of families purchasing a house and settling down locally. The lower willingness of families without houses to settle down due to higher levels of employment discrimination in their place of residence compared to families without houses with lower levels of employment discrimination in their place of residence once again indicates that employment discrimination has a significant catalytic effect on the crowding out of the settlement threshold. When employment discrimination is more severe in a certain region, it will directly affect the settlement intention of families without houses, leading to a relative increase in the threshold for settling in that region. This crowding-out effect not only affects population mobility and talent aggregation in cities, but also has adverse effects on the long-term development of cities.

Table 10. Housing heterogeneity.

Variable	Explained variable: the settlement intention of rural-urban migrants			
	2SLS		IV-Probit	
	Have a house	Houselessness	Have a house	Houselessness
	m1	m2	m3	m4
Settlement threshold	-0.607	-0.2302	-4.623***	-1.7706***

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	（0.2047）	（0.4685）	（0.6023）	（1.2613）
Hukou threshold # Employment discrimination	-0.2391***	-0.4001***	-0.5172	-1.348***
	（0.1057）	（0.1198）	（0.385）	（0.3880）
Employment discrimination（Within the system =1）	0.0951	0.2423****	0.151	0.881***
	（0.0829）	（0.0891）	（0.315）	（0.3001）
Urban control variable	Yes	Yes	Yes	Yes
Household control variable	Yes	Yes	Yes	Yes
Individual control variable	Yes	Yes	Yes	Yes
Urban fixed effect	Yes	Yes	Yes	Yes
Constant	11.6095***	-7.3690	24.3969***	-21.153
	（2.1125	（4.7962）	（6.2926）	（12.924）
N	4467	1282	4467	1282
Pseudo/R-squared	0.8833	0.9476	0.8833	0.9476

z-statistics in parentheses *** p<0.01，** p<0.05，* p<0.1.

Furthermore, the rural-urban migrants without housing in the destination city was divided into two sub samples, high-skilled and low-skilled, for heterogeneity testing. The results are shown in Table 11. It can be seen that the increase in the household registration thresholds has had a significant crowding-out effect on the migrants without housing with different skill levels. Both high-skilled and low-skilled populations are more likely to be influenced and choose to leave the current city when facing higher household registration thresholds. Compared to others, the high skilled rural urban migrant population without housing is more sensitive to the household registration threshold. When the threshold increases, the high-skilled rural-urban migrants without housing are more likely to be affected and choose to leave the current city. For the high-skilled rural-urban migrants without housing, the catalytic effect of employment discrimination is more significant, which is consistent with hypothesis 3. The increase in the threshold has a greater negative impact on the willingness of high-skilled labor without housing to settle down, and the catalytic effect of employment discrimination is more pronounced for the high-skilled rural-urban migrants without housing. The possible reason for this phenomenon is that the high-skilled migrants without housing has stronger bargaining power when choosing to settle in a city based on their professional skills and knowledge advantages. Especially in the context of increasingly fierce competition for talent among cities, this advantage has become more significant. High-skilled rural-urban migrants often possess certain professional skills and knowledge backgrounds, and they have relatively high competitiveness in the urban job market. Therefore, when cities raise the household registration threshold and exacerbate employment discrimination, the high-skilled migrants are more likely to choose to leave their current cities and transfer to other cities with similar economic development levels but lower household registration thresholds compared to low skilled labor.

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Table 11. 流入地无购房的"乡-城"流动人口技能水平异质性.

Variable	Explained variable: the settlement intention of rural-urban migrants			
	2SLS		IV-Probit	
	Low skill	high skill	Low skill	high skill
	m1	m2	m3	m4
Settlement threshold	-0.1052	1.5282	-0.2572	（0.4123*
	（0.5066）	（0.0992）	（1.3581）	（0.8068）
Settlement threshold # Employment discrimination	-0.4256***	-0.1676*	-1.375***	-1.4735*
	（0.1374）	（0.2812）	（0.4381）	（1.2538）
Employment discrimination（Within the system =1）	0.2362**	0.0991	0.8231**	0.7126
	（0.1051）	（0.1788）	（0.3428）	（0.7905）
Urban control variable	Yes	Yes	Yes	Yes
Household control variable	Yes	Yes	Yes	Yes
Individual control variable	Yes	Yes	Yes	Yes
Urban fixed effect	Yes	Yes	Yes	Yes
N	1104	178	1104	178
Constant	-3.7873	-16.8356	-11.7882	-81.8741
	（5.2724）	（14.0081）	（14.1470）	（61.8114）
Pseudo/R-squared	0.9436	0.1812	0.9436	0.9752

z-statistics in parentheses *** p<0.01，** p<0.05，* p<0.1.

Further Discussion

In China, the presence of abundant job opportunities and heightened economic dynamism serves as a megnet, drawing significant numbers of rural-urban migrant population. Conversely, urban areas often impose higher costs of living, particularly in domains such as housing, education, and healthcare. For small and medium-sized cities, employment landscape is comparatively constrained, potentially exacerbating employment pressure on migrants and diminishing their tendency to establish permanent residence. Nevertheless, these cities offer relatively affordable living expenses, which may cater to the settlement preferences of a subset of the migrant population (Wu et al., 2020). Consequently, the scale of cities likely exerts differential influence on the settlement intentions of rural-urban migrants.

Acknowledging the disparities in developmental paths between large cities and small urban centers, the effect of elevating household registration thresholds in cities of varying sizes on migrants' settlement willingness may vary substantially. In order to delve into the heterogeneous impact of these thresholds on the settlement willingness of rural-urban migrants across different city sizes, this study adopts a nuanced approach. Guided by the "Notice of the State Council on Adjusting the Classification Standards for Urban Size" and the "2017 Urban Construction Statistical Yearbook" issued by the Ministry of Housing and Urban-Rural Development, the sampled cities have been categorized and analyzed according to their respective sizes. Table 12 presents the classification of

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the sampled cities based on their respectie sizes, facilitating a nuanced understanding of the complex interplay between city size, household registration policies, and migrants' settlement decisions.

Table 12. Size division of sample cities.

Classification	Size	Cities (according to the characteristics of the sample data, the time is limited to 2017)
super city	More than 10 million	Beijing, Tianjin, Shanghai, Shenzhen, Chongqing
super-large city	5 to 10 million	Nanjing, Guangzhou, Wuhan, Xi 'an, Chengdu
Type I	3 to 5 million	Dalian, Shenyang, Changchun, Harbin, Shijiazhuang, Hangzhou, Qingdao, Jinan, Changsha, Zhengzhou, Kunming
Type II	1 to 3 million	Taiyuan, Hohhot, Ningbo, Hefei, Xiamen, Haikou, Nanning, Fuzhou, Nanchang, Urumqi, Yinchuan, Lanzhou, Xining, Guiyang
Small city	Under 1 million	Lhasa

Table 13 presents the regression analysis outcomes elucidating the effect of various household registration thresholds on the settlement intention of rural-urban migrants across varying city sizes. In type II large cities and metropolitan regions, the coefficient of impact pertaining to the urban settlement threshold exhibits a negative association with the settlement intention of rural-urban migrants. While the household registration threshold imposes a certain negative influence on the migrants' settlement intentions, its statistical significance may be obscured by the preponderance of other influential factors. Conversely, in Type I large cities, mega cities, and supercities, a heightened household registration threshold significantly curtails the settlement intentions of rural-urban migrant population. This phenomenon is likely intertwined with city-specific attributes such as population density, employment opportunities, and the cost of living. Furthermore, it underscores the existence of disparities in the ability of cities at different tiers to attract and influence migrant populations, highlighting the varied impacts of household registration thresholds on the settlement preferences and willingness of rural-urban migrants.

It should be noted that the elevation in the household registration threshold exerts a particularly significant crowding-out effect on the rural-urban migrant population within megacities. This phenomenon can be attributed to a multifaceted interplay of factors, includingthe substantial population density characteristic of megacities, the heightened competition within their job market, and the elevated cost of living. These factors collectively contribute to the abserved crowding-out effect, thereby influencing the settlement intentions and opportunities of the rural-urban migrant populace.

The threshold for settlement in megacities, as the pivotal center of population and resource congregation, exerts an important influence on the floating population dynamics. While elevating the household registration threshold may partially alleviate population pressures within these metropolises, it concurrently presents greater difficulties and challenges for individuals seeking developmental opportunities, thereby exacerbating the uncertainty experienced by the floating population and potentially impacting economic growth trajectory and labor market supply of these cities. Therefore, the formulation of household registration policies for megacities necessitates a holistic consideration of factors encompassing population mobility, economic development, and social stability, to ensure the policy's fairness and sustainability. Furthermore, to foster the sustainable development of megacities, it is imperative for government to strike an optimal balance

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between population mobility and urban development, in order to achieve long-term prosperity and stability within these urban agglomerations. This necessitates the exploration and implementation of stratagies that effectively navigate the intricate interplay between these dimensions.

Table 13. Heterogeneity of city size.

Variable	Explained variable: the settlement intention of rural-urban migrants				
	super city	super-large city	Type I	Type II	Small city
	m1	m2	m3	m4	m5
Settlement threshold	-5.8056**	-0.2316**	-4.6429*	-2.3448	-1.5184
	（3.7203）	（0.2652）	（1.1125）	（0.1590）	（0.0417）
Settlement threshold # Employment discrimination	-0.4077	-0.3802	-1.5090**	-0.9363*	-0.0139
	（0.3960）	（0.5126）	（0.8559）	（0.4999）	（0.2291）
Employment discrimination	0.0779	0.0062	1.3945**	0.9399**	0.0120
	（0.1252）	（0.3541）	（0.7424）	（0.4456）	（0.1978）
Urban control variable	Yes	Yes	Yes	Yes	Yes
Household control variable	Yes	Yes	Yes	Yes	Yes
Individual control variable	Yes	Yes	Yes	Yes	Yes
Urban fixed effect	Yes	Yes	Yes	Yes	Yes
Constant	51.0576	-7.7322***	15.4081***	4.9327***	0.0364
	（42.3675）	（2.3297）	（3.4879）	（0.5130）	（0.8048）
Regression method	IV-Probit	IV-Probit	IV-Probit	IV-Probit	IV-Probit
N	9，590	4，224	7526	10，066	912
Pseudo/R-squared	0.9247	0.9997	0.4769	0.6257	0.1137

z-statistics in parentheses *** p<0.01，** p<0.05，* p<0.1.

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5. Conclusions

This study used macro and micro data analysis to examine the impact of household registration thresholds on the settlement intentions of "rural-urban" migrants, with a particular focus on whether household registration thresholds have a crowding-out effect on this group's acquisition of urban resident status and a catalytic effect on employment discrimination. The regression results show that the higher the threshold level for household registration in the inflow area, the more restrictions and uncertainties it may mean, which reduces the confidence of the floating population in settling in the city for a long time and makes it easier for them to choose to leave the current city. The study also found that employment discrimination may exacerbate the crowding-out effect of place of residence, especially for high-skilled migrants without housing. In cities with high housing prices, the migrant population lacking housing faces greater economic pressure and living difficulties, making it more difficult for them to integrate into the local society and job market, which further exacerbates their tendency to choose to leave the current city. This indicates that high housing prices have become one of the important considerations for “rural-to-urban” migrant populations when choosing cities to settle in. It is worth noting that the research results remain robust after controlling for measurement errors in relative housing prices, sample selection bias, and sample heterogeneity. This means that the research results have high reliability and stability, providing important empirical support for understanding the impact of household registration thresholds on the settlement intentions of rural-urban migrants.

These findings have certain policy implications for guiding the formulation and optimization of urban household registration policies. The high threshold for household registration means the unaffordability of obtaining urban identity for the rural-urban migrants who are important participants in the process of urbanization, while high-skilled talents are the core objects of competition among cities. Therefore, the government has the responsibility to formulate reasonable household registration policies, ensure that the threshold for household registration is within a reasonable range, and improve the level of public services to attract more rural-urban migrants to settle down. To provide more stable housing for the rural-urban migrants without houses through price subsidies, tax reductions, and other means, and weaken the crowding-ut effect of the household registration threshold.

The reform of the registered residence system is a key move to promote new urbanization, the citizenization of the "township city" floating population, and Chinese path to modernization. It is also an important link in the reform of China's public service supply. The analysis results of this study found that the middle-income rural-urban migrants is more willing to reside in cities where the residence permit system is implemented. A high threshold for household registration means that the urban identity cannot be afforded, which has a significant crowding-out effect on the willingness to reside. Moreover, the high-skilled rural-urban migrants without housing is more sensitive to the high threshold for household registration. This shows that the policy path of adjusting the registered residence system to promote the floating population to obtain legal identity is effective. With the deepening of economic system reform, promoting the "township city" floating population to realize citizenization requires a broader and deeper reform of the registered residence system.

On the one hand, there has been a deeper breakthrough in addressing the key issue of providing housing for new city residents. For example, we can consider the linkage reform of rural homestead and urban registered residence, and use rural homestead to replace real estate, so as to further release household consumption capacity. Conditional areas can explore monetary subsidy policies such as rental consumption vouchers, which can be used for both renting and selling, reducing the proportion of housing expenditure for the rural-urban migrants in consumption expenditure, and revitalizing existing housing. At the same time, establish a long-term "township city" floating population naturalization system to provide a more stable and sustainable urban living environment for the floating population, which is conducive to their better integration into urban areas and the realization of their own potential. In addition, corresponding arrangements for the progress of open household registration should be formulated based on the differences in the size and level of different cities, in order to better meet the actual needs and development stages of various regions and promote

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balanced development between cities. Exploring the establishment of housing finance mutual aid institutions, the formation of housing security banks, and the acquisition of developer inventory in metropolitan areas to achieve optimal allocation of human resources and promote coordinated development of regional economy.

On the other hand, the distribution function of public goods and social welfare carried by the current registered residence system is constantly stripped. Gradually eliminate discriminatory policies and treatment differences between urban and rural registered residence, and establish a unified civil rights and social welfare system. This includes abolishing the discriminatory restrictions imposed by the registered residence system on public goods and services such as education, medical care and employment, and ensuring that all citizens enjoy equal rights and opportunities. We will promote the reform of the registered residence registration system and gradually eliminate the restrictive role of registered residence registration in the distribution of public goods and social welfare. Establish a more inclusive and flexible population management system, allowing people to freely choose their place of residence and employment, and enjoy corresponding public services and benefits. Simultaneously establish a unified social security system. Including unified systems for pension insurance, medical insurance, unemployment insurance, etc. Ensure that all residents can enjoy the basic social security treatment without being affected by registered residence. In addition, we will strengthen the integrated development of urban and rural areas. Promote coordinated economic and social development between urban and rural areas, and narrow the urban-rural gap. By fostering the development of the rural economy, enhancing rural infrastructure, and augmenting farmers' income levels, it is feasible to incentivize a larger proportion of the rural population to either remain in their local communities or opt for employment and residency in urban certers. This approach addresses the fundamental chllenges of rural-urban disparities and contributes to a more balanced and sustainable development trajectory.

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