

Article

Investigating the Impact of Demographic and Personal Variables on Post-Retirement Migration Intention of Rural Residents: Evidence from Inner Mongolia, China

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Abstract: With the intensification of population aging in rural areas, it becomes increasingly important to analyze the post-retirement migration intention of rural residents and the variables influencing these intentions. However, there is a lack of research on this point. In this study, we focused on rural residents aged 45 to 60 and used the logistic regression model to investigate the demographic and personal variables influencing their post-retirement migration intention. The data used in this study were collected from one hundred sixty-four households in three rural areas of Inner Mongolia in 2011. From the results of this study, we found that gender, part-time employment, savings level, children's residence and occupational stability, and interest in urban living positively affect migration intention. In contrast, the number of rural close friends, relationships with others in rural areas, and evaluation of rural living all have negative effects. In addition, we employed age and the proportion of mobile income as control variables to examine the variables that influence the post-retirement migration intention in different age groups and mobile income groups. The analysis reveals that the variables influencing post-retirement migration intention varied across age groups and mobile income groups, and this variation can be attributed to the differences between groups' characteristics.

Keywords: rural areas; post-retirement migration intention; logistic regression model; demographic and personal variables



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1. Introduction

Population aging is one of the significant features of the global population structure in the 21st century [1]. Although population aging initially began in developed countries, the pace of aging in developing countries is continuously accelerating [2]. In China, population aging is also progressing. China entered the “aging society” in 2001, with more than 7% of the population aged 65 and above. In 2021, this proportion increased to 14.20%, showing that the problem of population aging has significantly intensified during the past 20 years [3]. Population aging is likely to continue unabated in the foreseeable future. In China, rural areas are leading the way in anticipating this trend. By the end of 2020, the total population aged 65 and above in rural areas was approximately 90 million, accounting for 17.72% of the total rural population [4]. In rural areas, in addition to the current aging population, due to the accelerated outflow of younger generations to urban areas [5,6], population aging has become even more severe.

In rural areas, where the population aging is becoming more severe, the demand for medical and long-term care services is anticipated to rise. However, in China, the disparities between urban and rural areas have caused most rural areas to lag significantly behind in economic development and construction of medical facilities [7]. In general, urban residents have easier access to medical resources and services than rural residents [8,9].

Given this situation, it is assumed that many rural residents will migrate to urban areas after retiring. However, suppose many elderly rural residents migrate to urban areas. In that case, there may be an increase in demand for healthcare, welfare, and care services [10], which could significantly burden urban medical institutions, lifestyle support, and care facilities and may have an effect on the sustainable development of urban areas.

On the other hand, rural areas are blessed with abundant natural resources [11], and residents can live a self-sufficient life in areas where agriculture thrives. Moreover, many residents choose to settle in rural areas due to strong connections with relatives and local communities built through social interactions, mutual assistance, and a sense of belonging and attachment to their hometown [12]. Alternatively, if many elderly residents continue to reside in rural areas, this could pose challenges to healthcare in rural areas [13–15] and affect the sustainable development of rural areas.

Therefore, it is essential to conduct an in-depth study on the intention of residents to migrate to urban areas after retirement (referred to hereafter as “post-retirement migration intention”). Although many studies in the existing literature have analyzed the intention of rural residents to migrate to urban areas [16–19], there is a lack of research analyzing the post-retirement migration intention of rural residents. This study fills this gap by conducting a comprehensive investigation into the post-retirement migration intentions of rural residents and the demographic and personal variables influencing them. We hope that the conclusions of this study can provide the necessary knowledge for estimating future rural-urban post-retirement migration and for determining what social capital and environmental conditions are required in urban and rural areas for retirement. We also hope that this study can provide some insights for policymakers. Moreover, the findings gained from this study are expected to be beneficial not only for rural areas in China but also for countries around the world facing the challenges of population aging.

In this study, we focus on the rural areas of Bayan Nur, Inner Mongolia, China, where the economic conditions are moderate, and agriculture is the primary industry. We select three rural areas with different economic and living conditions and conduct an intention survey regarding whether rural residents (the rural residents primarily refer to the potential elderly people between the ages of 45–60 who are on the verge of entering the elderly age group) intend to migrate to urban areas after retirement. Using the logistic regression model, we aim to understand which demographic and personal variables impact post-retirement migration intention and how each variable affects post-retirement migration intention. Additionally, age is significantly correlated with migration, and potential elderly individuals in different age groups may exhibit distinct characteristics, leading to variations in the variables influencing post-retirement migration intention. And except for fixed income derived from agriculture, rural residents also have mobile income from part-time jobs, small-scale family livestock farming (classified as mobile income due to its instability and smaller scale), temporary work, and other sources. The higher the proportion of mobile income, the higher the opportunities outside of agriculture, indicating less reliance on rural areas and fewer restrictions imposed by rural conditions. Rural residents from different mobile income groups may have different variables influencing their migration intention. By focusing on the differences in age and the proportion of mobile income, we aim to determine the variables that influence the residents’ intentions in each group and to clarify how age and the proportion of mobile income affect rural residents’ post-retirement migration intention. The structure of the paper is as follows. In Section 2, we review the existing literature on migration intention. Section 3 introduces the data and methods used in this study. Section 4 analyzes the variables influencing the post-retirement migration intention of potential elderly people in rural areas. In Section 5, we summarize the study and present future research directions.

2. Literature Review

Secure living and good quality of life are expectations for human society’s survival and sustainable development at any time. Migration is one of the pathways to realizing

these expectations [20]. Migration is regarded as a positive force for reducing regional income disparities and fostering the development of rural areas. The assimilation and reorganization of rural labor by migrants influence local agricultural development and environmental changes [21,22]. The remittances generated by migration increase the purchasing power of households, promote agricultural investment, ensure the food security of households [23], reduce poverty and improve household livelihoods [24], and have a positive impact on the sustainable development of the area of origin [25,26].

Multiple researchers have demonstrated a strong correlation between migration intention and actual migration [27–29]. Migration intention serves as a good predictive indicator for actual migration. In cases where migration flow data is scarce or even absent, migration intention data can be used to estimate migration flows [30,31]. In recent years, many researchers have concentrated on studying migration intention [32–34]. Migration encompasses international migration, primarily from low-income countries to high-income countries [35], and internal migration, mainly from rural to urban areas [36]. The existing literature has extensively analyzed the variables influencing international and internal migration intention.

Regarding international migration, personal variables such as age, marital status, and migration experience have been confirmed to influence migration intention [29]. Additionally, individuals with a higher level of education are more likely to migrate [37]. This is because those with higher education are more likely to adapt to the cultural differences brought about by migration and are more inclined to cross cultural boundaries than those with lower education [38]. Social and economic variables such as income have a significant impact on the intention of international migration [39]. The probability of migration increases considerably with increased personal income [40], and occupation-related changes in the labor market also influence the intention to migrate [41]. Migration decisions are not solely individual choices but are often influenced by other family members [42]. Family variables are also potential influencers of migration intention [43]. Social networks in migration destinations are the most important driving force for international migration intention, whereas the intimate social network in the country of origin decreases the probability of international migration intention [44]. Other potential determinants of migration intention include satisfaction with current life [45]. Life satisfaction negatively correlates with migration intention; individuals dissatisfied with their current living conditions are more inclined to migrate [46], and those with higher life satisfaction tend to have lower migration intention [29].

Moreover, an increasing number of rural residents choose to migrate to urban areas due to urbanization. Societal and economic variables such as employment opportunities, economic capacity, and income play pivotal roles in determining the migration of rural residents [19,47,48]. Personal variables like gender, age, education level, and marital status influence migration intention [49–51]. Similar to international migration, migration decisions are not made exclusively by individuals but are influenced by family members, making family variables influential on migration intention [52]. Those with greater connections with family members remaining in their hometowns are less likely to choose migration [53]. Social networks in their hometown may also influence migration intention, and strong connections with their neighbors may discourage rural residents from migrating to urban areas [53,54]. Preferences for specific areas can shape migration intention, and these preferences are often influenced by regional characteristics. The livability of urban areas influences migration intention positively [55], while environmental pollution in urban areas has a negative impact on rural residents' migration intention [56,57]. Pollution can reduce life and work satisfaction, negatively affecting the desire to migrate to urban areas [58]. Furthermore, individual preference for their hometown negatively correlates with their desire to migrate to urban areas [59–61].

Age is an important variable for migration, as younger individuals are more likely to migrate [62]. A substantial proportion of migrants are rural youths. Even though their values may change over time, it is essential to analyze their migration intention because they

may become potential migrants as time passes [63]. Existing research on rural youth and the variables influencing their migration intention is abundant [64,65]. Personal variables such as gender, marital status, and educational background play a significant role in determining the migration intention of youths [35,66,67]. Migration intention is also influenced by socioeconomic variables such as employment opportunities and employment status [35,68]. In addition, family backgrounds, including parents' occupation, migration experience, and educational level, are considered to influence youths' migration intention [69,70]. Migration intention decreases when importance is placed on being with family [71]. Social networks play an important role in the formulation of migration intention. The social networks of close friends in the hometown are positively correlated with the intentions to remain in the hometown [72]. The internet has progressively emerged in rural areas due to technological development, allowing rural youth to reconcile information gaps, reduce digital divides, and establish connections with other areas [73]. The use of the internet has shown a positive impact on the formation of migration intention among rural youth [74]. However, this influence could also be triggered by negative media coverage. The internet may reduce preference for hometown, especially the desire to remain there [75,76]. Adams et al. (2016) [12] revealed the primary variables for non-migration are high satisfaction and limited mobility potential, and this limited mobility potential is more likely to result from the attachment to rural areas. Rural attachment is a critical variable influencing migration intention [77].

In previous studies, sufficient research has been conducted on the variables that influence international migration and internal migration intention, and many of these studies have focused on youth. The variables influencing migration intention include age, education, gender, and socioeconomic variables such as income and occupational status, family variables, variables related to social networks in hometown, as well as variables related to regional preferences such as satisfaction with the current areas and interest in the destination which all belong to demographic and personal variables. Nonetheless, as the aging society progresses, research on the post-retirement migration intention of rural residents soon to enter old age becomes crucial. Currently, there is a lack of research that specifically targets potential elderly people in rural areas and focuses on studying post-retirement migration intention and influencing variables.

This study takes the rural areas of Bayan Nur in Inner Mongolia, China, as the research area and targets potential elderly people living in rural areas. The study aims to investigate which demographic and personal variables influence post-retirement migration intention. This study employs age and mobile income as control variables to analyze the variables that influence migration intention in different age groups and mobile income groups. This study also focuses on the characteristic differences between age groups and mobile income groups to investigate the variations in the variables.

3. Research Objectives and Methods

3.1. Study Area

In order to make the research more general, taking into consideration the accessibility of transportation and the differences in local economic level, the following three survey areas were chosen for the field investigation: Xianfeng Town, Xinhua Town, and Bulongnaoer Town, located in Bayan Nur in western Inner Mongolia (See Figure 1). These towns oversee numerous villages, are primarily engaged in agriculture, and belong to rural areas. Among these, Xianfeng Town is in the eastern portion of Bayan Nur's Urad South County. It borders Baotou on the east, Ordos on the south, and Wulashan Town on the west and is intersected by the Jingzang Expressway and National Highway 110 to the north, covering a total area of 488 km². Notably, Xianfeng Town has a thriving goji berry cultivation industry, resulting in relatively higher incomes for rural residents and a prosperous rural area. Xinhua Town is in the northern part of Linhe District, the central district of Bayan Nur. Compared to the other survey areas, it is closer to the city center and is known for cultivating vegetables. It covers a total area of 167.43 km². Bulongnaoer Town (referred to

as Bulong Town) is situated in the southwest of Dengkou County, Bayan Nur. It is adjacent to the desert and covers a total area of 70.7 km². Xianfeng Town has the most favorable economic and living conditions among the three survey areas. In contrast, Xinhua Town has moderate economic and living conditions, while Bulongnaoer Town has relatively low economic and living conditions. In recent years, all three areas have experienced a decrease in the agricultural population, and most farmers are in the 45–60 age group.

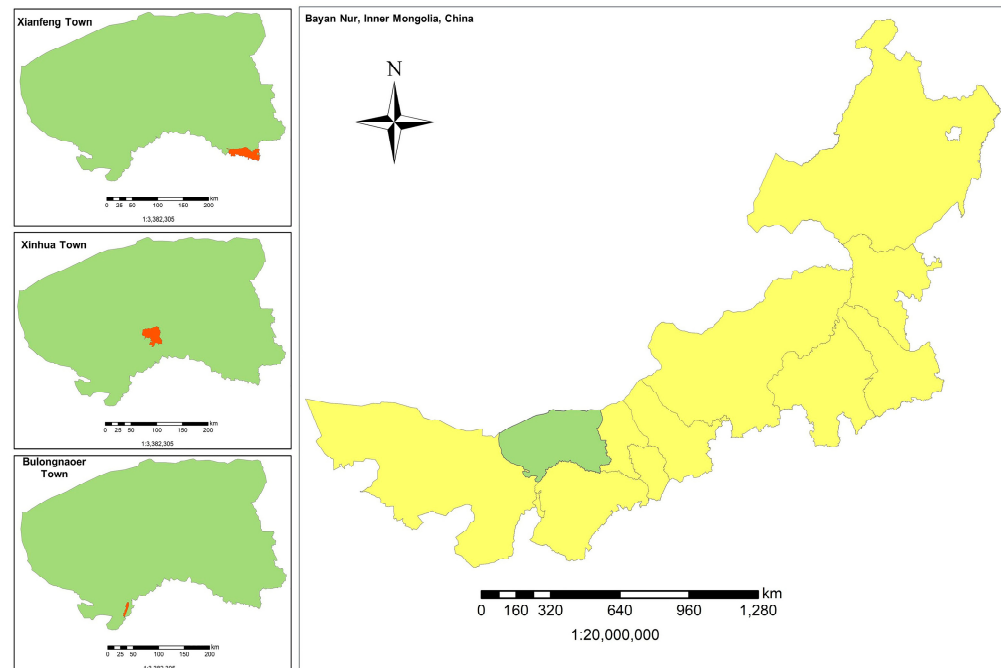


Figure 1. Location of Xianfeng Town (red polygon), Xinhua Town (red polygon), and Bulongnaoer Town (red polygon) in Bayan Nur (green polygon), Inner Mongolia (yellow polygon), China.

3.2. Data

In this study, we examine the primary variables influencing post-retirement migration intention rather than examining actual rural residents who have already decided to migrate. The post-retirement migration intention can partially reflect their preferences for future retirement areas. In order to acquire more authentic and reliable information, our data is mainly obtained through field investigations conducted via face-to-face interviews. The data collection was conducted in August 2011 for one month.

In the study areas, respondents were randomly selected based on the following criteria: (1) 45–60 years old; (2) willing to respond to the questionnaire. A total of 164 householders (in their absence, interviews were conducted with the spouse who fulfills the above criteria) were interviewed, including 54 from Xianfeng Town, 56 from Xinhua Town, and 54 from Bulongnaoer Town. Before conducting the interviews, they were informed that they would receive no monetary compensation and that their privacy would not be compromised. All interview and survey information were collected for research purposes only. The survey was conducted with the respondents' verbal consent and cooperation.

According to the China County Statistical Yearbook (2014) [78], the populations of the three areas are as follows: Xinhua Town has 39,457 people, Xianfeng Town has 32,076 people, and the smallest is Bulong Town with 6973 people; these places generally have a smaller population. This study considers that the responses of members from the same household are often highly similar. We have chosen to take households as the unit of analysis. Therefore, the actual number of rural residents meeting the criteria is not very high. Furthermore, the advantage of our data is that it was obtained through face-to-face interviews, which allows us to capture the interviewees' actual thoughts and ensures the

quality and accuracy of the data. We believe that our dataset is sufficient to reflect the actual situation and support the conclusions of this study.

In addition to the desired post-retirement living area as an indicator of rural residents' post-retirement migration intention, there are several demographic and personal variables believed to influence post-retirement migration intention. These variables include gender, healthy status, part-time employment and savings level (socioeconomic variables), children's residence and occupational stability (family variables), the number of close friends in rural areas, relationships with others in rural areas (variables related to rural social networks), evaluation of rural living, and interest in urban living (variables related to preference for urban or rural areas). These associated variables were surveyed using specific question items, shown in Table 1. The interviewees' responses to these question items were self-evaluations.

Table 1. Specific question items.

Variable	Abbreviation	Name	Description	Codes/Values
1	GENDER	Gender	Gender	1 = Men 0 = Women
2	HEALTHY	Healthy status	Current healthy status	3 = Healthy 2 = Somewhat not healthy 1 = Not healthy
3	PTEM	Part-time employment	Do you have any part-time employment besides agriculture?	1 = Yes 0 = No
4	SAVING	Savings level	What level of savings do you have to maintain your post-retirement life?	5 = Sufficient 4 = Average 3 = To some extent 2 = A little 1 = None
5	CRO	Children's residence and occupational stability	Do your children live in urban areas and engage in stable occupations?	1 = Yes 0 = No
6	NCR	The number of close friends in rural areas	How many close friends do you have within the rural area?	5 = ≥ 40 4 = ≥ 20 and < 40 3 = ≥ 10 and < 20 2 = ≥ 5 and < 10 1 = < 5
7	ROR	Relationships with others in rural areas	How are your relationships with others in rural areas?	5 = Very good 4 = Good 3 = Average 2 = Not very good 1 = Not good
8	EVARL	Evaluation of current rural living	How content are you with your current rural living?	5 = Very satisfied 4 = Somewhat satisfied 3 = Neutral 2 = Somewhat dissatisfied 1 = Very dissatisfied
9	INTUL	Interest in urban living	How interested are you in urban living?	3 = Very interested 2 = Somewhat interested 1 = Not very or not at all interested
10	PRL	Desired post-retirement living areas	After retirement, do you intend to migrate to urban areas or reside in rural areas?	1 = Urban 0 = Rural

3.3. Statistical Description of the Data and Research Method

Table 2 presents the statistical description of the sample population, which consists of 164 surveyed residents. The respondents were separated according to whether they intend to remain in rural areas or migrate to urban areas. From the statistical description of population characteristics, those who intend to migrate to urban areas are more likely to be men, have a higher level of savings, and have part-time employment experience. Rural residents with children in stable urban employment are more likely to migrate to the urban area. Moreover, those more interested in urban areas are more likely to migrate. On the other hand, residents who remain in rural areas can rely more on their friends and the social networks they built within the rural community. Consequently, residents with more close friends who have established high-quality and intimate relationships with other rural residents are more likely to remain in rural areas. In addition, those who intend to remain in rural areas tend to have a relatively positive evaluation of rural living.

Table 2. Aggregated results of survey items.

Survey Items	Migration Intention	
	Continue Living in Rural Areas	Urban Areas
GENDER	0.736 (0.443)	0.822 (0.385)
HEALTHY	2.505 (0.736)	2.589 (0.642)
PTEM	0.308 (0.464)	0.397 (0.493)
SAVING	1.934 (1.298)	2.644 (1.610)
CRO	0.275 (0.449)	0.397 (0.493)
NCR	3.341 (1.157)	2.479 (1.015)
ROR	4.451 (0.637)	3.753 (0.662)
EVARL	4.176 (0.838)	3.425 (0.762)
INTUL	1.857 (0.824)	2.726 (0.534)

Note: Standard deviations in parentheses. The number of people willing to migrate to urban areas is 73.

This study employs the logistic regression model to objectively analyze the variables affecting migration intention to reveal the relationship between post-retirement migration intention and the potential influencing variables. The logistic regression equations are shown as Equations (1) and (2).

$$Pr(y = 1|X) = \frac{1}{1 + \exp(-f(X))} \quad (1)$$

$$f(X) = \alpha_0 + \sum_{j=1}^9 \alpha_j x_j \quad (2)$$

where the objective variable y is a binary variable with the value 1 when the resident intends to migrate to urban areas after post-retirement and 0 when the resident intends to continue living in rural areas. X represents the vector of explanatory variables that influence the migration intention of rural residents. Specifically, x_1 – x_9 represent the variables of gender, healthy status, part-time employment, savings level, children's residence and occupational stability, the number of close friends in rural areas, relationships with others in rural areas, evaluation of rural living, and interest in urban living. α_0 – α_9 are parameters.

4. Results and Discussion

4.1. Analysis of Variables Influencing Post-Retirement Migration Intention

Using the collected data from 164 respondents, this study analyzes the demographic and personal variables affecting rural residents' post-retirement migration intention through the logistic regression model. Table 3 shows the results using logistic regression models. Model 1 examined the impact of gender, health status, socioeconomic and family variables, and variables related to rural social networks on rural residents' migration intention. Model 2 incorporated variables related to the preference for the area, specifically the evalua-

tion of rural living and interest in urban living, to examine the effect on migration intention. The Pseudo R-square values for Model 1 and Model 2 are 0.303 and 0.479, and the AIC values are 173.090 and 137.37, respectively. Regardless of Pseudo R-square or AIC values, Model 2 is significantly better than Model 1. Consequently, the conclusions derived from Model 2 are utilized in this study. Furthermore, a multicollinearity analysis was conducted to assess multicollinearity among the model's influencing variables, and Table 3 presents the maximal VIF value. All VIF values for influencing variables were less than 10.

Table 3. Analysis of the variables influencing post-retirement migration intention.

Variable	Model 1	Model 2
GENDER	1.261 (0.528) **	1.404 (0.635) **
HEALTHY	0.201 (0.298)	0.137 (0.337)
PTEM	0.594 (0.427)	0.944 (0.521) *
SAVING	0.457 (0.143) ***	0.589 (0.183) ***
CRO	0.859 (0.428) **	1.311 (0.537) **
ROR	−1.340 (0.321) ***	−0.848 (0.356) **
NCR	−0.690 (0.0.210) ***	−0.808 (0.251) ***
EVARL		−1.019 (0.323) ***
INTUL		1.346 (0.370) ***
Sample size	164	164
VIF (maximum value)	1.250	1.310
Pseudo R-square	0.303	0.479
AIC	173.090	137.37

Note *: p -value ≤ 0.1 ; **: p -value ≤ 0.05 ; ***: p -value ≤ 0.01 . Standard errors in parentheses.

Model 2 confirmed that gender [45], part-time employment [54], savings level [44], and children's residence and occupational stability influence the migration intention, which has a positive effect on the intention to migrate to urban areas after post-retirement, whereas the number of close friends in rural areas and the relationships with others in rural areas [43,46] have a negative effect on the migration intention, which is consistent with previous studies. Those who are men, have part-time employment experience, have a relatively high level of savings, have children with stable occupations in urban areas, have few close friends in rural areas, and have weak relationships with others in rural areas are more likely to migrate to urban areas. In contrast, they are more willing to continue living in rural areas. Model 2 also revealed that the evaluation of rural living and interest in urban living influence migration intention. The evaluation of rural living has a negative effect on migration intention, whereas their interest in urban living has a positive effect. The evidence for this result can be found in [33,61], where it is shown that the greater their interest in urban living and the lower their evaluation of rural living, the more likely they are to migrate. Further examination of these variables is conducted in the following analysis.

- Gender: There are significant differences in migration intentions due to gender [34,35]. Men are more likely to migrate compared to women [43]. This might be related to men who actively engage in agricultural work and social activities having more opportunities for social engagement and connections with urban areas than women, and the caring responsibilities also attributed to women, which might make migration less easy. Family and social constraints often limit the possibility of moving for women [67]. On the other hand, people who embrace risks are more mobile [38]; women tend to avoid risks, which may explain why they prefer to remain in rural areas.
- Part-time employment: The agricultural experiences of rural residents have a significant negative impact on their migration intentions. The more extensive their agricultural production experience, the less likely they are to migrate to urban areas [54]. Part-time employment can mitigate this effect. Rural residents with part-time employment in other industries tend to have more connections with urban areas and acquire more information than those solely engaged in agriculture. As a result, these

people with part-time employment are more likely to leave rural areas and have a stronger intention to migrate to urban areas.

- Savings level: Savings level has an important impact on migration intentions [44]. The expense of living in urban areas is greater than in rural areas. It is challenging for rural residents without sufficient savings to migrate to the urban area. Therefore, the greater the savings, the more likely they are to migrate to urban areas [40]. Those with no savings can only continue to live in rural areas due to financial constraints.
- Children's residence and occupational stability: Family variables have a positive influence on migration intentions [69], and having urban family ties offers increasingly favorable migration opportunities [33,43]. If the children of rural residents work in urban areas and have stable employment, it is reasonable to assume that the rural residents would prefer to migrate to the urban areas and live near their children, which would provide a more secure and comfortable retirement.
- The number of close friends in rural areas and relationships with others in the rural area: Frequent contact between rural residents and their close friends can hinder the intention of rural residents to migrate to urban areas [54]. In rural areas, broader social networks, especially close social networks, reduce the likelihood of migration intentions [44,65]. Close friends in rural areas are frequently closer and more amiable with each other than with their relatives, and they can provide emotional and instrumental support [76]. Therefore, residents with a greater number of close friends within the rural area are more likely to continue residing in rural areas after retirement. If the relationship with others in the rural area is positive, there is a tendency to remain in the rural area. Conversely, if negative, there is a tendency to migrate to the urban area.
- Evaluation of rural living and interest in urban living: The importance of evaluation of rural living for migration intentions has been widely confirmed in different research [12,39,46,53]. This evaluation of rural living is measured by the degree of deviation between rural areas with urban areas [76]. If a place cannot meet people's needs or they are dissatisfied with life in that place, they tend to seek another better place to migrate [67,76]. Urban areas generate interest in urban life through convenient infrastructure and healthcare services [58,74], and the interest in urban life significantly influences migration intentions [56]. Therefore, rural residents who appreciate rural living are more likely to continue to reside in rural areas. Those with a significant interest in urban living are more likely to migrate to urban areas after retirement. Individuals with little or no interest in urban living are more committed to remaining in rural areas.

4.2. Impact of Age Group on Post-Retirement Migration Intention

Although previous research has confirmed the significant influence of age on migration intentions [27,34,67], there has been a lack of research specifically focusing on the impact of age on post-retirement migration intentions. In order to investigate this, this section focuses on the differences between age groups and analyzes the variables that influence post-retirement migration intention at various age groups. The potential elderly people (45–60 years old) are divided into three age groups: the early potential elderly (45–49 years old), the middle potential elderly (50–54 years old), and the late potential elderly (55–60 years old). The number of people in each group (the proportion of people willing to migrate to urban areas) is 58 (47%), 59 (54%), and 47 (30%), respectively.

Based on the above data, the logistic regression model is used to analyze the variables influencing post-retirement migration intention at various age groups. The results are shown in Table 4. The range of Pseudo R-square values for the models is 0.53–0.63, and the AIC values are 50.295, 50.784, and 46.793, respectively. VIF values of all variables are less than 10.

Table 4. The impact of age group differences on post-retirement migration intention.

Variable	Early Potential Elderly Group (45–49 Years Old)	Middle Potential Elderly Group (50–54 Years Old)	Late Potential Elderly Group (55–60 Years Old)
GENDER	4.210 (1.471) ***	−0.328 (1.594)	0.317 (1.222)
HEALTHY	−0.704 (1.313)	−1.313 (0.858)	0.796 (0.770)
PTEM	0.169 (1.249)	1.134 (1.230)	2.123 (1.279) *
SAVING	1.009 (0.471) **	0.951 (0.395) **	1.033 (0.583) *
CRO	4.696 (3.000)	2.178 (1.076) **	0.452 (1.260)
NCR	−1.884 (0.754) **	0.369 (0.596)	−1.192 (0.681) *
ROR	−0.870 (0.793)	−2.521 (1.029) **	−0.952 (1.017)
EVARL	−1.536 (0.858) *	−1.335 (0.950)	−1.429 (0.753) *
INTUL	1.493 (0.859) *	1.332 (1.162)	1.586 (0.761) **
Sample size	58	59	47
VIF (maximum value)	2.141	2.064	2.176
Pseudo R-square	0.622	0.622	0.532
AIC	50.295	50.784	46.793

Note *: p -value ≤ 0.1 ; **: p -value ≤ 0.05 ; ***: p -value ≤ 0.01 . Standard errors in parentheses.

From Table 4, it is evident that for rural residents in the early potential elderly group, variables such as gender, savings level, the number of close friends in rural areas, evaluation of rural living, and interest in urban living impact their post-retirement migration intention. Post-retirement migration intentions of rural residents in the middle potential elderly group are influenced by variables such as savings level, children's residence and occupational stability, and relationships with others in rural areas. For rural residents in the late potential elderly group, post-retirement migration intention is influenced by savings level, the number of close friends in rural areas, evaluation of current rural living, and interest in urban living. These variables have the same signs as shown in Model 2 (Table 3).

From the above, it can be observed that regardless of the age group of rural residents, savings level is an important variable affecting their post-retirement migration intention. However, besides the savings level, there are age-related differences in the variables that influence the post-retirement migration intention. These differences can be attributed to the disparities in characteristics between age groups. The following analysis further examines this aspect.

- Gender: Those in the early potential elderly group have superior physical health and fitness than those in the middle and late potential elderly groups and tend to possess a more adventurous temperament, making them more capable of engaging in agricultural work and social activities. These contribute to the greater influence of gender on the post-retirement migration intention of rural residents in the early potential elderly group.
- Part-time employment: Compared to rural residents in the early and middle potential elderly groups, rural residents in the late potential elderly group have spent more time within their rural social circles, relying more on these networks. Part-time employment might increase their connection to urban areas, decrease their dependence on rural social circles, and make them more inclined to migrate to urban areas. Hence, the post-retirement migration intention of rural residents in the late potential elderly group is influenced by part-time employment.
- Children's residence and occupational stability: As mentioned above, rural residents in the early potential elderly group have superior physical health and fitness, allowing them to prefer living independently rather than relying on their children. On the other hand, rural residents in the late potential elderly group have developed a sense of autonomy and independence after adapting to the situation of their children leaving the household. They are more likely to maintain their independence and self-sufficiency than to rely on their children for support in their retirement. However, rural residents in the middle potential elderly group maintain strong emotional connections

with their children. In retirement, they expect to maintain a close relationship with their children and rely on their children's support and care to meet their emotional and daily requirements. As a result, the variables of children's residence and occupation stability only affect the post-retirement migration intention of rural residents in the middle potential elderly group.

- The number of close friends in rural areas and relationships with others in rural areas: Rural residents in the early potential elderly group are still in the career development phase. They need to establish a wide social network to expand their social circle, diversify their connections, and seize opportunities. In contrast, rural residents in the late potential elderly group may experience increased loneliness due to changes in their family dynamics, such as the departure of their children. As a result, they are more likely to seek out close friends to establish relationships and alleviate loneliness. As for rural residents in the middle potential elderly group, they typically must assume parental care responsibilities and deal with work-related pressures. Due to energy and time limitations, they are more likely to establish high-quality and stable intimate relationships to satisfy their emotional requirements. Therefore, rural residents in the early and late potential elderly groups prioritize the number of close friends, while those in the middle potential elderly group prioritize the quality of their relationships with others in rural areas.
- Evaluation of rural living and interest in urban living: The early potential elderly group is frequently in the career development stage and places greater emphasis on urban opportunities and growth potential. The late potential elderly group may begin to face retirement problems, and compared to rural areas, urban areas may offer greater retirement convenience. On the other hand, those in the middle potential elderly group have stable careers and act as family supporters, making it difficult for them to give up their current stable rural occupations and lifestyle even if they are interested in urban living or dissatisfied with rural living. Thus, variables such as interest in urban living and evaluation of rural living can influence the migration intention of rural residents in the early and late potential elderly groups but do not affect rural residents in the middle potential elderly group.

4.3. Impact of the Proportion of Mobile Income on Post-Retirement Migration Intention

Many studies have demonstrated the positive impact of income on migration intentions [40,46], but there has been limited research analyzing the effect of mobile income on post-retirement migration intentions. This section examines the impact of the proportion of mobile income on migration intention after retirement. We investigate the variables that influence the post-retirement migration intention of various groups with varying levels of mobile income. The average proportion of mobile income, in addition to the fixed income from agriculture, is 28%, according to the survey data. Based on this indicator, the 164 sample data are divided into two groups: the low mobile income group (proportion of mobile income less than 28%) and the high mobile income group (proportion of mobile income above 28%). The number of rural residents in each group (the proportion of people willing to migrate to urban areas) is 91 (46%) and 73 (42%), respectively. Using this data, the logistic regression model is applied to investigate the variables influencing the post-retirement migration intention of rural residents in various mobile income groups. The analysis results are presented in Table 5.

In Table 5, the Pseudo R-square values (AIC) for each model are 0.399 (95.464) and 0.665 (53.310), respectively. All the variables' VIF values are below 10. Based on the results in Table 5, we can analyze that for rural residents with low mobile income, gender, savings level, children's residence and occupation stability, the number of close friends in the rural area, relationships with others in rural areas, evaluation of rural living, and interest in urban living have an impact on their migration intention. On the other hand, for rural residents with high mobile income, variables such as savings level, the number of close friends in rural areas, evaluation of rural living, and interest in urban living influence their

post-retirement migration intention. These influential variables show the same signs as shown in Model 2 (Table 3).

Table 5. The impact of differences in mobile income proportion on migration intention.

Variable	Low Mobile Income Group	High Mobile Income Group
GENDER	2.268 (0.873) ***	−0.116 (1.280)
HEALTHY	0.284 (0.419)	0.586 (0.856)
PTEM	0.304 (0.766)	1.798 (1.172)
SAVING	0.716 (0.260) ***	0.573 (0.348) *
CRO	1.377 (0.709) *	1.299 (1.036)
NCR	−0.674 (0.308) **	−1.491 (0.574) ***
ROR	−1.132 (0.463) **	−0.562 (0.820)
EVARL	−1.063 (0.426) **	−1.080 (0.636) **
INTUL	0.924 (0.483) *	2.524 (0.996) **
Sample size	91	73
VIF (maximum value)	1.420	1.934
Pseudo R-square	0.399	0.665
AIC	95.464	53.310

Note *: p -value ≤ 0.1 ; **: p -value ≤ 0.05 ; ***: p -value ≤ 0.01 . Standard errors in parentheses.

Regardless of whether rural residents belong to the group with low mobile income or the group with high mobile income, savings level, the number of close friends in the rural area, evaluation of rural living, and interest in urban living influence their post-retirement migration intention. However, compared to the group with high mobile income, the migration intention of rural residents with low mobile income is influenced by gender, children's residence and occupational stability, and relationships with others in rural areas. There are distinctions in the variables influencing the post-retirement migration intention of rural residents belonging to various mobile income groups. These differences are most likely attributable to the unique characteristics of the various mobile income groups. This is investigated further in the subsequent analysis.

- **Gender:** In the group with low mobile income, women are more likely to assume primary household and caregiving responsibilities, limiting their opportunities for social engagement. In contrast, in the group with high mobile income, women often have the chance to balance career and family responsibilities, possess better economic foundations, and enjoy equal access to social engagement as men. As a result, gender has no impact on residents' migration intention in the high mobile income group, whereas it does influence rural residents in the low mobile income group.
- **Children's residence and occupational stability:** Rural residents with high mobile income earn from agriculture and other part-time employment outside of agriculture. They can rely on themselves for retirement without depending on their children. On the other hand, rural residents in the low mobile income group depend primarily on agriculture, making it more difficult to save enough for retirement. The difficulty in obtaining retirement money could make the low mobile income group more inclined to rely on their children for retirement. Hence, children's residence and occupational stability become an important variable influencing the post-retirement migration intention of rural residents with low mobile income, whereas it has no effect on the migration intention of rural residents with high mobile income.
- **Relationships with others in rural areas:** Compared to rural residents with low mobile income, rural residents with high mobile income have higher income, more economic resources, and the ability to establish broader social networks and relationships with more people from other areas and urban areas, enabling them to rely on themselves for retirement and receive support from people from other areas and urban areas. In contrast, rural residents with low mobile income, constrained by their own income, resources, and limited social networks, rely more on the support of other rural residents. The relationships with others in rural areas are crucial in determining whether they

can access support and resources. Thus, the migration intention of rural residents with low mobile income is influenced by relationships with others in rural areas, whereas the migration intention of rural residents with high mobile income is not affected by relationships with others in rural areas.

5. Conclusions

This study aimed to provide references and actionable suggestions for optimizing the future development of an aging society and contributing to sustainable social development. The investigation targeted potential elderly people (45–60 years old) and used the logistic regression model to investigate the demographic and personal variables that influence post-retirement migration intention. Through the analysis of rural areas in Inner Mongolia, China, we can understand the demographic and personal variables that influence the post-retirement migration intention of rural residents. The findings indicate that gender, part-time employment, savings level, children's residence and occupation stability, and interest in urban living positively affect migration intention, whereas the number of rural close friends, relationships with others in rural areas, and evaluation of rural living have a negative effect.

Furthermore, this study employed age and the proportion of mobile income as control variables and examined their individual effects on post-retirement migration intention. Specifically, rural residents of all age groups are significantly influenced by their level of savings. Regarding mobile income, it can be concluded that both low and high mobile income groups are influenced by the number of close friends in rural areas, savings level, evaluation of rural living, and interest in urban living in their migration intention. However, besides those, the variables influencing the post-retirement migration intention vary across age groups and mobile income groups, and this variation can be attributed to the differences between age groups' characteristics and the unique characteristics of the various mobile income groups.

This study fills the gap in research on the post-retirement migration intentions of rural residents. The results of this study not only provide insights for analyzing the post-retirement migration intentions of rural residents in China but also serve as a reference for studying the post-retirement migration intentions of rural residents in other countries. However, this study also has the following limitations. This study used data from 2011, which is the only source we could find that reflects the intention to migrate after retirement and can provide detailed insights into the demographic and personal variables influencing the migration intention of rural residents after retirement (such as gender and savings levels). Changes in these variables are typically incremental and long-lasting. Our research findings continue to have significant theoretical and practical reference value for understanding the current post-retirement migration intentions and influencing variables of rural retirees. Furthermore, based on these data, the logistic regression model was employed to quantify the demographic and personal variables and observe the underlying mechanisms of these effects. This research approach provides a foundation for future studies. However, we also acknowledge the limitation of using relatively old data in this study. To further enhance the analysis of migration intentions, we will collect the most recent data to update and improve upon the results obtained from our 2011-based data.

In addition, this study only analyzed the variables influencing the migration intention of residents in three rural areas of Bayan Nur, Inner Mongolia, China. Future research will evaluate the generalizability of the conclusions obtained in this study by incorporating more rural areas. Regional characteristics could potentially influence migration intention, and the impact of regional variations on migration intention also needs to be taken into consideration. Furthermore, due to the limited data, the interaction effects of age and the proportion of mobile income on migration intention are not accounted for in this study. Future research will collect more data to examine the interaction effects between age and the proportion of mobile income on migration intention.

Meanwhile, we hope that through this study, more researchers interested in studying the post-retirement migration intentions of rural residents can engage in our study and encourage researchers in various countries and regions to analyze the post-retirement migration intentions, exploring the differences and commonalities in these intentions and influencing variables across different cultural backgrounds. We also hope that through this study, scholars from various disciplines can develop an interest in post-retirement migration intentions and analyze rural residents' post-retirement migration intentions from multiple perspectives and viewpoints, ultimately providing policymakers with research outcomes that have greater practical value.

This study contributes to understanding the intentions of rural residents regarding settling in rural areas or migrating to urban areas after retirement. Based on the results of this study, we offer the following policy recommendations to policymakers. Firstly, savings level has a significant impact on rural residents' migration intention, and therefore, improvements can be made to the social security system for rural residents, including pension, medical insurance, and welfare systems, to ensure that the elderly can receive appropriate benefits and enjoy their retirement. Secondly, improve rural infrastructure and elderly care services, including enhancing the construction of public transportation networks and providing comfortable living environments. At the same time, offer personalized housing and lifestyle services for rural residents who desire to migrate to urban areas, enabling them to better integrate into urban life after retirement. In addition, government departments should respect the needs and choices of rural residents when formulating retirement and pension policies and actively support and guide these intentions to improve the quality of life of rural residents, meet their needs, and simultaneously promote the optimal allocation of urban and rural social resources and the sustainable development of both urban and rural areas.

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