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Empirical Study on Pension Insurance for Floating Population in Sichuan Province

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Abstract: *The impact of floating population on a region is multifaceted, on the one hand bringing population welfare and promoting economic development to the region, and on the other hand, it also brings many negative impacts. As an important component of the social population, the social welfare and life happiness of the floating population are key issues that we need to pay attention to, among which the participation of pension insurance is an important indicator. This article analyses the impact of personal and family characteristics on the participation of pension insurance, and the results of the impact are multifaceted.*

Keywords: *Endowment insurance, Floating population, Logistic model*

1. Introduction

In the national population census data, one item is the floating population, which is included in the population separated from households. The separated population refers to the population whose residence and registered residence registration are not the same, and the floating population refers to the surplus population in addition to the separated population in the municipal district [1].

According to official data released by the National Bureau of Statistics, the floating population in China reached 37.582 million in 2020, accounting for 26.6% of the national population. In 2010, the floating population was 22.143 million yuan, an increase of 69.72%. The significant increase in mobile population has various reasons, including development and survival needs, war factors, and policy factors, among which the main reason is economic factors. This can be clearly seen from the population flow: the population continues to flow to the eastern coastal areas and internal urban areas. The population proportion in the eastern region continues to rise, increasing by 2.1% compared to 2010; at the same time, there has been a movement from rural to urban areas and from small cities to large cities within various provinces.

Such high population mobility has played an important role in promoting the overall economic development of the country and the socio-economic development of the region. On the one hand, it has increased the vitality of the population inflow areas, reduced the aging of the regional population, and on the other hand, it has also promoted consumption in the inflow areas, driving the economy of the region.

However, there are also many problems with the floating population itself. Firstly, the cultural level of the majority of the migrant population is very low, and only a small portion of the floating population who are introduced through talent or other means have a high level of cultural and professional literacy; secondly, there is a lack of social security. Due to the fact that the household registration is not in the inflow area, the separation of individuals and households has led to a series of problems such as medical insurance and elderly care difficulties, and many local preferential policies cannot be enjoyed; another issue is the high incidence of criminal cases. According to statistics, 80% of cases are committed by foreign populations, most of which are due to economic poverty [2].

Therefore, when we see the advantages and benefits that mobile populations bring to the region, we also need to understand their socio-economic well-being, among which whether the mobile population participates in pension insurance is an important measurement factor. Pension insurance plays an important role, whether at the social or individual level [3]: At the social level, pension insurance is conducive to social harmony and stability, allowing the smooth replacement of new and old labor, ensuring the rationality of employment structure and the renewable nature of labor; at the individual level,

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pension insurance provides retirees with basic economic income, smoothing personal consumption, and makes them dependent on their old age.

Therefore, the factors that affect the participation rate of pension insurance for mobile populations are the focus of our attention.

2. Research Methods

The research model used in this article is the Logistic model, which is a nonlinear regression model. The dependent variable used in this paper is whether to participate in endowment insurance, which is a binary variable. The dependent variable that does not meet the requirements of OLS regression should conform to normal distribution.

The Logistic model has the form of a Logistic function(1):

$$Y_i = \frac{\beta_0}{1+\beta_1 e^{(\beta_2 X_i)}} + \varepsilon_i \quad (1)$$

The logistic function is a monotonically increasing function, showing an overall S-shape, with two horizontal asymptotic lines Y=0 and Y=1 representing class variables of 0-1.

Logistic model has many advantages, for example, it can accept the interpreted variables of nonnormal distribution with lower requirements, and the overall prediction accuracy rate is relatively high, the operation is simple, and the results are clear; but it also has drawbacks such as requiring transformation for nonlinear features and not being able to handle a large amount of multi-class features or variables well [4].

3. Data Sources and Descriptive Analysis

3.1. Data source

The data used in this article is the dynamic monitoring data of mobile population in Sichuan Province in 2016. Due to significant differences in observable characteristics between rural and urban samples, as well as significant differences in economic and social development between rural and urban areas, this study only selected urban samples, that is, samples with statistical data sourced from neighborhood committees.

Due to the fact that there is not a significant difference in education level between those who have not attended school and those who have only attended primary school, the combination of those who have not attended school and those who have not attended primary school or below is necessary.

Merge nonagricultural, agricultural to residents, nonagricultural to residents, and residents in the nature of household registration into nonagricultural.

Unmarried, divorced, widowed, and cohabiting in marriage are considered unmarried, while first and second marriages are considered married.

The current flow time is divided into less than 1 year, 1-4 years, 5-9 years, and more than 10 years.

Divide occupational types into four categories, namely blue collar, white-collar, business, and others. Blue collar workers include catering, housekeeping, cleaning, security, decoration, express delivery, other commercial and service industry personnel, agricultural, forestry, animal husbandry and fishing, water conservancy production personnel, production, transportation, construction, and other personnel; white collar workers include leaders of state organs and mass organizations, enterprises and institutions, professional and technical personnel, civil servants, administrative personnel, and related personnel; doing business includes peddling and doing business, while other professions include nonfixed professions and others.[5]

Divide the nature of units into 5 categories: the first category is individual industrial and commercial households and others, the second category is private enterprises, the third category is government agencies, public institutions, state-owned and state-owned holding enterprises, collective enterprises, joint-stock, joint ventures, associations/private organizations, the fourth category is Hong Kong, Macao and Taiwan sole proprietorship enterprises, foreign-owned enterprises, Sino foreign joint ventures, and the fifth category is unincorporated.[6]

ISSN 2616-5902 Vol. 5, Issue 11: 73-78, DOI: 10.25236/AJBM.2023.051112

Divide housing types into four categories, the first being self-owned housing, including self-purchased housing and self-built housing; the second type is rental housing, including rental units/employers' houses and private houses; the third category is informal housing, including housing, employment venues, and other informal housing. The fourth category is free housing provided by units/employers, government provided affordable housing, and public rental housing.

The age classification ranges from 15 to 59 years old, with a group of 5 years old.

Divide the family size into 4 groups, with 1, 2, and 3 people each forming a group, and 4 or more people forming the fourth group.

Divide income into 5 groups, with 1500 and below being the first group, 1501-3000 being the second group, 3001-5000 being the third group, and 5001 yuan and above being the fourth group.

3.2. Descriptive statistics

Table 1: Descriptive statistics.

		Whether to participate in pension insurance					
		YES	Proportion	NO	Proportion	Total	Proportion
Gender	Male	1,012	52.06%	932	47.94%	1,944	54.55%
	Female	886	54.69%	734	45.31%	1,620	45.45%
Education	Primary school & below	274	50.83%	265	49.17%	539	15.12%
	Middle school	738	46.71%	842	53.29%	1,580	44.33%
	High school/technical secondary school	464	52.91%	413	47.09%	877	24.61%
	Junior college students	244	69.12%	109	30.88%	353	9.90%
	Undergraduate students	168	82.35%	36	17.65%	204	5.72%
	Postgraduate	10	90.91%	1	9.09%	11	0.31%
Nature of household registration	Agriculture	1,437	49.48%	1,467	50.52%	2,904	81.48%
	Non-agriculture	461	69.85%	199	30.15%	660	18.52%
Marital status	Single	390	48.03%	422	51.97%	812	22.78%
	Married	1,508	54.80%	1,244	45.20%	2,752	77.22%
Flow range	Trans-provincial	283	47.48%	313	52.52%	596	16.72%
	Cross city within province	1,079	53.71%	930	46.29%	2,009	56.37%
	Cross county within the city	536	55.89%	423	44.11%	959	26.91%
Flow time	Less than 1 year	153	51.34%	145	48.66%	298	8.36%
	1-4 years	648	51.14%	619	48.86%	1,267	35.55%
	5-9 years	527	52.28%	481	47.72%	1,008	28.28%
	Over 10 years	570	57.52%	421	42.48%	991	27.81%
Occupation type	Blue collar	995	51.13%	951	48.87%	1,946	54.60%
	White collar	308	73.51%	111	26.49%	419	11.76%
	Be in business	499	49.26%	514	50.74%	1,013	28.42%
	Other	96	51.61%	90	48.39%	186	5.22%
Nature of Work Unit	Individual businesses and others	761	44.79%	938	55.21%	1,699	47.67%
	Private enterprise	537	57.62%	395	42.38%	932	26.15%
	Collective units of state-owned organs	377	80.73%	90	19.27%	467	13.10%
	Foreign joint venture	32	78.05%	9	21.95%	41	1.15%
	Unitless	191	44.94%	234	55.06%	425	11.92%
Housing type	Own Housing	599	61.18%	380	38.82%	979	27.47%
	Renting	1,071	49.91%	1,075	50.09%	2,146	60.21%
	Informal residence	79	47.31%	88	52.69%	167	4.69%
	Provided by unit/employer/government	149	54.78%	123	45.22%	272	7.63%
Family size	1 person	221	47.63%	243	52.37%	464	13.02%
	2 people	309	54.88%	254	45.12%	563	15.80%
	3 people	855	56.40%	661	43.60%	1,516	42.54%
	4 or more people	513	50.24%	508	49.76%	1,021	28.65%
Personal income	1500 yuan and below	207	44.71%	256	55.29%	463	12.99%
	1501-3000	924	53.01%	819	46.99%	1,743	48.91%
	3001-5000	552	58.17%	397	41.83%	949	26.63%
	5001 and above	215	52.57%	194	47.43%	409	11.48%

After excluding invalid data, the total sample size of mobile population in Sichuan Province is 3564.

In Table 1, it can be seen that male samples account for 54.55%, while female samples account for 45.45%. There is little difference in the response of men and women to whether to participate in pension insurance, and regardless of gender, the number of people participating in pension insurance is always slightly higher than the number of people not participating in pension insurance.

In terms of education level, there is no significant difference in the response to whether to participate

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in pension insurance between high school/junior college education and below, with a proportion of around 50%; for those with a college degree or above, as their education level increases, the number of people participating in pension insurance significantly increases. 69.12% of those with a college degree participate in pension insurance, which has risen to 82.35% at the undergraduate level.

In the sample, the majority are agricultural household registration, accounting for 81.48%, and the proportion of people with agricultural household registration participating in pension insurance is 49.48%; the sample with non-agricultural household registration is more willing to participate in pension insurance, with a proportion of 69.85%.

The majority of the population in the sample is married, and the impact of whether to get married on whether to participate in pension insurance is not particularly significant, with only a 6.77 percentage point change.

For the scope of mobility, the number of insured individuals who cross counties within the city is greater than those who cross cities within the province, and the number of insured individuals who cross cities within the province is slightly greater than those who cross provinces, but the difference is not particularly significant.

From the perspective of mobility time, there is not much difference in whether-or-not they participate in pension insurance, with the largest difference occurring between 10 years or more and less, with a gap of about 5 points.

The proportion of blue collar, business, and other professions participating in insurance is not significantly different, both around 50%; for white-collar workers, the number of people participating in pension insurance has significantly increased, with 73.51% of the sample participating in pension insurance.

For the nature of the unit, the proportion of state-owned and collective units participating in pension insurance is the highest, followed by foreign-funded joint ventures, with 80.73% and 78.05% respectively; the proportion of individual businesses and others without units is relatively low, at 44.79% and 44.94%, respectively.

The sample with own housing has the highest proportion of participating in pension insurance, reaching 61.18%; the lowest is 47.31% of informal residences.

The difference in the proportion of different family sizes participating in pension insurance is not particularly large, all within 10%.

Personal income shows an inverted U-shaped characteristic for whether to participate in pension insurance, increasing from 44.71% in the lowest income bracket to 58.17% in the middle-income bracket, and finally decreasing to 52.57% in the highest income bracket.

4. Empirical Analysis Results

In the logistic regression results in Table 2, the probability ratio of the male variable is 0.7209, which is significant at the 0.01 level, indicating that men are less willing to participate in pension insurance compared to women. This may due to the fact that men's average salary is higher than women's and their work is more stable.

The probability ratio for middle school is 1.1072, but it is not significant; the probability ratios of junior high school, high school/technical secondary school, college, undergraduate, and graduate students are all greater than 1, and are significant at levels of 0.01 or 0.1. This fact indicates that education has a positive promoting effect on individuals' awareness of related pension insurance. The higher the education, the more they can recognize the importance of insurance for life, and the more people will participate in pension insurance.

The probability ratio of household registration being agricultural is 0.7440, which is significant at the level of 0.01. This data indicates that people with non agricultural household registration have a greater advantage in participating in pension insurance, and society may have some preferential treatment for non agricultural household registration.

The probability ratio of getting married is 1.0134, indicating that the influence of whether to get married on whether to participate in pension insurance is not significant. However, it is not significant at the level of 0.1.

ISSN 2616-5902 Vol. 5, Issue 11: 73-78, DOI: 10.25236/AJBM.2023.051112

Table 2: Regression result analysis.

Variables	Odds Ratio	Std. Err.	P>z
Male	0.7209	0.0552	0.0000
Middle school	1.1072	0.1214	0.3530
High school/technical secondary school	1.6796	0.2216	0.0000
Junior college students	2.7617	0.4888	0.0000
Undergraduate	4.3143	1.0418	0.0000
Postgraduate	7.7709	8.5138	0.0610
Agriculture	0.7440	0.0797	0.0060
Married	1.0134	0.1400	0.9230
Cross city within province	1.3127	0.1361	0.0090
Cross county within the city	1.5034	0.1761	0.0010
1-4 years	0.8305	0.1185	0.1930
5-9 years	0.8485	0.1261	0.2690
Over 10 years	1.0143	0.1554	0.9260
White collar	1.3239	0.1850	0.0450
Be in business	1.2613	0.1195	0.0140
Others	0.8994	0.1508	0.5270
Private enterprise	1.6279	0.1587	0.0000
Collective units of state-owned organs	4.0605	0.5991	0.0000
Foreign joint venture	4.0251	1.5897	0.0000
Unitless	0.9961	0.1157	0.9730
1501-3000	1.3343	0.1536	0.0120
3001-5000	1.5072	0.1913	0.0010
5001 and above	1.3137	0.1986	0.0710
Renting a house	0.8629	0.0760	0.0940
Informal residence	0.6367	0.1198	0.0160
Provided by unit/employer/government	1.2750	0.2063	0.1330
age1grp5	1.2835	0.0311	0.0000
2 people	1.0826	0.1848	0.6420
3 people	1.2846	0.2178	0.1400
4 or more people	1.1090	0.1966	0.5600
_cons	0.0723	0.0239	0.0000

The probability ratio of cross city within a province is 1.3127, and the probability ratio of cross county within a city is 1.5034, both of which are significant at the 0.01 level. This indicates that for individuals, the larger the mobility range, the fewer people participate in pension insurance. The probability of participating in pension insurance across provinces is greater than that across provinces, and the probability of participating in pension insurance across counties within cities is greater than that across cities. The larger the scope of mobility, the greater the change in socio-economic conditions, and the more unable the sample to integrate into the local collective, resulting in a lower probability of participating in pension insurance.

For flow time, the probability ratios of all three variables are not significant.

For professional nature, white-collar workers have the highest probability of participating in pension insurance, with a probability ratio of 1.3239, followed by business with a probability ratio of 1.2613, followed by blue collar workers and others; at the same time, except for other professions, the other two variables are significant at the 0.05 level. Because white-collar workers include leaders of government agencies and mass organizations, this group is higher than other occupational groups in terms of work formality, stability, and personal educational and ideological level. Therefore, the population participating in pension insurance is the largest. Blue collar workers include catering, housekeeping, cleaning and other personnel, and their job nature is sometimes unstable, resulting in a much lower probability of participating in pension insurance.

The probability ratio of collective units in state-owned institutions is 4.0605, the probability ratio of foreign-funded joint ventures is 4.0251, and the probability ratio of private enterprises is 1.6279, both of which are significant at the 0.01 level. This indicates that formal units such as state-owned and foreign-funded enterprises will have a higher proportion of employees participating in pension insurance, and the probability is much higher than that of individual businesses.

The inverted U-shaped characteristics can be clearly seen in different income stages, with a probability ratio of 1.3343 for 1501-3000, rising to 1.5072 for 3001-5000, and then decreasing to 1.3137 for 5001 and above, all of which are significant. When income is low, it may limit the willingness to purchase pension insurance. As income increases, the probability of purchasing pension insurance will increase. However, when income reaches a certain level, the smoothing effect of pension insurance on consumption is not very strong, and the probability of purchasing will decrease.

The probability ratio provided by the unit/employer/government is 1.2750, but it is not significant; the probability ratio of informal residence is the lowest, at 0.6367, followed by 0.8629 for renting a house.

ISSN 2616-5902 Vol. 5, Issue 11: 73-78, DOI: 10.25236/AJBM.2023.051112

The probability of self owned housing participating in pension insurance is higher than the first two. The type of housing reflects an individual's economic conditions, and the better the housing, the higher the probability of participating in pension insurance.

The age classification ranges from 15 to 59 years old. As the age increases by 5 years, the probability ratio of pension insurance increases, with a probability ratio of 0.0311, which is significant at the 0.01 level. This indicates that as the floating population approaches retirement age, their probability of purchasing pension insurance will gradually increase.

The impact of family size on the probability of purchasing pension insurance is not significant and is not statistically significant.

5. Conclusion

Through the above regression analysis, it can be concluded that men are less likely to participate in pension insurance. With the improvement of knowledge level and ability, individuals' willingness to participate in endowment insurance has increased. Non agricultural registered residence registration has certain implicit advantages in participating in endowment insurance. Marriage, mobility time and family size have little influence on whether to participate in endowment insurance, and there is no correlation between them. The larger the span of mobility, the harder it is for the floating population to integrate into local society, and the lower the likelihood of participating in pension insurance. The more formal the occupation and workplace, the greater the likelihood of the sample participating in pension insurance, The impact of income on pension insurance participation shows a trend of increasing first and then decreasing. The better housing, to some extent, reflects a better personal economic condition and social integration, and the higher the likelihood of participating in insurance. As age increases, the urgency of retiring will encourage more people to purchase pension insurance to ensure that the quality of life after retirement does not significantly decrease.[7]

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