A Study on the Changes of Population Flow Patterns in China

Comparative Analysis of Data from Two National Dynamic Monitoring Surveys of Floating Population

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ABSTRACT

This article uses dynamic monitoring survey data of floating population in 2009 and 2014, with a total sample size of 51,522 people. Using SPSS 22.0 software analysis and combining Excel mapping tools, the author has drawn a population age pyramid chart and a composite line chart. From the perspective of age specific analysis, this article explores the flow patterns of floating population in China, involving multiple aspects such as gender, urban area, marital status, flow scope, and reasons of flow, especially focusing on the analysis of the age structure changes of the floating population in five representative cities, namely Beijing, Taiyuan, Shanghai, Shenzhen, and Chengdu, so as to understand the characteristics and reasons for the changes in the floating model. It can be found in the research results that the structural characteristics of the shortage of migrant workers are prominent, and the possibility of urbanization in nearby areas is increased. The marriage problem of the floating population reflects intermarriage barriers. Therefore, by analyzing the age structure of the floating population, the researchers can grasp the changing patterns of the flow pattern, which can provide valuable reference materials for the realization of new urbanization.

Keywords: Floating population, Flow pattern, Age-specific structure, Migrant workers shortage, Nearby urbanization.

1. INTRODUCTION: RESEARCH BACKGROUND AND PURPOSE

With the continuous and rapid development of the economy and society, population flow has become increasingly frequent, and the total population and structure of China have also undergone significant changes, which have had a significant impact on China's economy, urbanization, and labor force. On November 11, 2015, according to the "China Floating Population Development Report 2015" released by the National Health and Family Planning Commission, China's floating population showed a continuous growth trend. According to the trend of urbanization, industrialization, and urban-rural population changes, it is predicted that by 2020, China's flow migration population will gradually increase to 291 million, with an annual growth of about 6 million people. According to the latest survey, the stability of residence for floating population has increased, and there is a strong desire to integrate into the city. According to the report, in 2014, 55% of the floating population lived in their current place of residence for an average of more than 3 years, 37% for more than 5 years, and more than half of the floating population had the intention to stay in their current place of residence for a long time. 56% planned to continue living in their current place of residence for more than 5 years. During the 12th Five-Year Plan period, the average annual growth of China's floating population was about 8 million, reaching 252 million by the end of 2015.

The imbalance in regional economic development leads people to be more willing to move to areas with better employment opportunities. Therefore, the flow direction of

floating population is more concentrated in coastal areas, eastern regions, and central and western regions, while areas with aging populations need to absorb young migrant labor to maintain economic growth. Due tothe implementation of the Western Development Strategy, it has to some extent expanded employment opportunities in the central and western regions, and the income level of local residents has also increased. Many laborers are gradually willing to stay in the central and western regions for survival and development. In economically developed regions, living standards and education levels are relatively high, and the low salaries and pressure of grassroots work make local young people or some foreign young people hesitant to work. This can lead to an uneven distribution of labor force or a shortage in some areas, resulting in a shortage of employment. For example, compared with other regions in China, there are significant differences in economic and social development conditions and environmental carrying capacity in the developed eastern coastal areas, resulting in significant differences in population flow and direction.

The majority of the specific floating population are grassroots workers, who lack job skills and are unable to find employment opportunities in many enterprises. They work locally for a long time to understand the local work mode and economic development, and are more willing to go to larger areas to seek more employment opportunities and scope when they cannot meet their job needs. However, migrant workers have a short-term nature, lack of serious requirements for labor security, and high costs of rights protection, which reduces the probability of labor disputes. This also reduces the trouble for enterprises in terms of employees and reduces conflicts for the interests of enterprises. This is also one of the reasons why migrant workers can find more employment opportunities in other places.

Therefore, this study uses the data from the 2009 and 2014 national dynamic monitoring surveys of mobile population by the Floating Population Service Management Department of the National Health and Family Planning Commission, and explores the flow patterns of mobile population in China from the perspective of age analysis. It analyzes the flow direction and flow traffic of floating population from multiple perspectives such as gender, age, population, and destination. This study also attempts to answer which people are actually floating, what changes have occurred in the flow pattern after six years, which regions and age groups are most likely to experience the so-called shortage of migrant workers, , and who are more likely to urbanize nearby. The answers to many questions will help provide factual basis for the realization of the new urbanization path.

2. RESEARCH DATA COLLECTION METHODS AND PROCESSES

2.1 Data Collection Instructions

This study used data from the National Health and Family Planning Commission's Floating Population Service Management Department's 2009 and 2014 national floating population dynamic monitoring surveys. The monitoring survey was conducted in August 2009 and May 2014, respectively. The survey targets the floating population, which refers to the population aged 15-59 who have resided in the inflow area for more than one month and are not registered in this district (county, city).

The sampling method used in the 2014 survey was stratified, multi-stage, and proportional to scale PPS sampling. The sampling was based on the 2013 annual report data of the entire floating population from 31 provinces (regions, cities) and Xinjiang Production and Construction Corps, using a stratified, multi-stage, and proportional PPS method for sampling. The relative error limit of the main survey indicators was controlled within 3% at a 95% confidence level; The relative error limit of relevant indicators in each province was controlled between 5% and 15%. According to this design goal, the sample size of the national floating population health and family planning dynamic monitoring survey is about 200,000 people nationwide. According to a survey of 20 people per sample point, the survey scope covers approximately 10,000 sample points.

In 2009, it was the first survey of the dynamic monitoring of floating population in China, which was a trial survey. Five cities including Beijing, Taiyuan, Shanghai, Shenzhen, and Chengdu were selected for a survey of 47,000 people.

2.2 Basic Information Explanation of Data

Using two-year data, the sample size of dynamic monitoring data for floating population in 2009 was 30,900 people, of which 13,794 were males, accounting for 44.6%; There were 17,106 women, accounting for 55.4%. The sample size of the 2014 National Dynamic Monitoring Survey on

Floating Population was 188,379, of which 110,298 were males, accounting for 58.6%; There were 78,081 women, accounting for 41.4%. The 2014 survey involved 32 provinces (districts, cities, and corps), with a total sample size of 20,622 in five cities: Beijing, Taiyuan, Shanghai, Shenzhen, and Chengdu, of which 11,380 were males, accounting for 55.2%; There were 9,242 women, accounting for 44.8%.

3. DATA CAUSAL ANALYSIS

3.1 The Age Structure of Floating Population Changing from Concentration to Dispersion

Comparing "Figure 1" and "Figure 2", it is found that in 2009, the floating population was mainly concentrated in the age group of 25-40, with more females than males. In 2014, the age distribution was relatively scattered, with fewer women than men, and an increase in the floating population aged 40 and above. "Figure 1" shows that the floating population of women is higher than that of men from 15 to 40 years old, while the floating population of men from 45 to 55 years old is higher than that of women. However, the turnover of women aged 55 is much lower than that of those aged 15. The age at which women have the highest flow is 25 years old, while men are in their 35 years old.

"Figure 2" shows that the population mobility of males is higher than that of females from the age of 14 to 55. Men aged 25 make up the largest proportion of the entire floating population, while women aged 55 have the smallest proportion. As the retirement age in 2014 was 60 years for men and 50 years for women, the mobility of men and women decreases as they age. This also reflects that as the floating population ages, the labor force of young adults decreases.
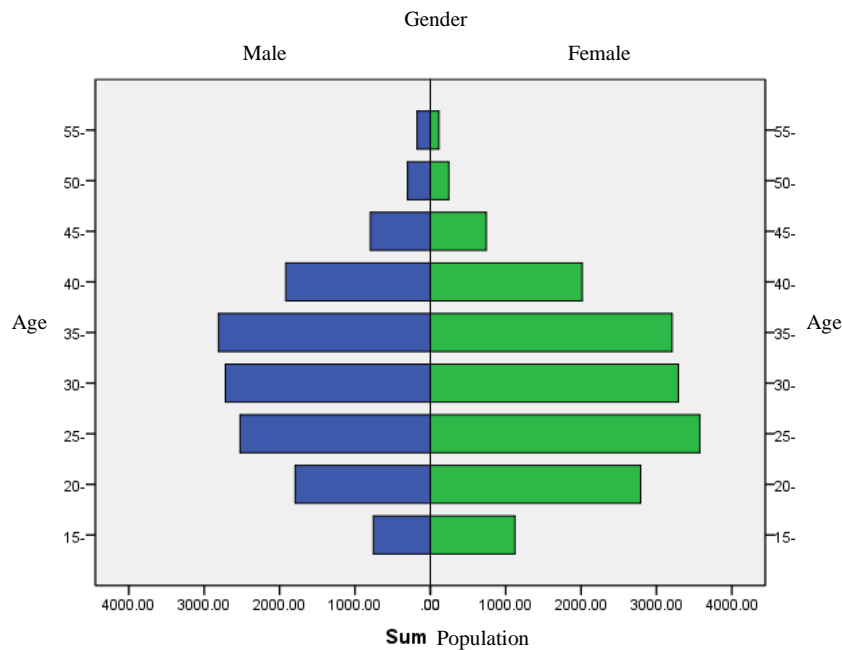

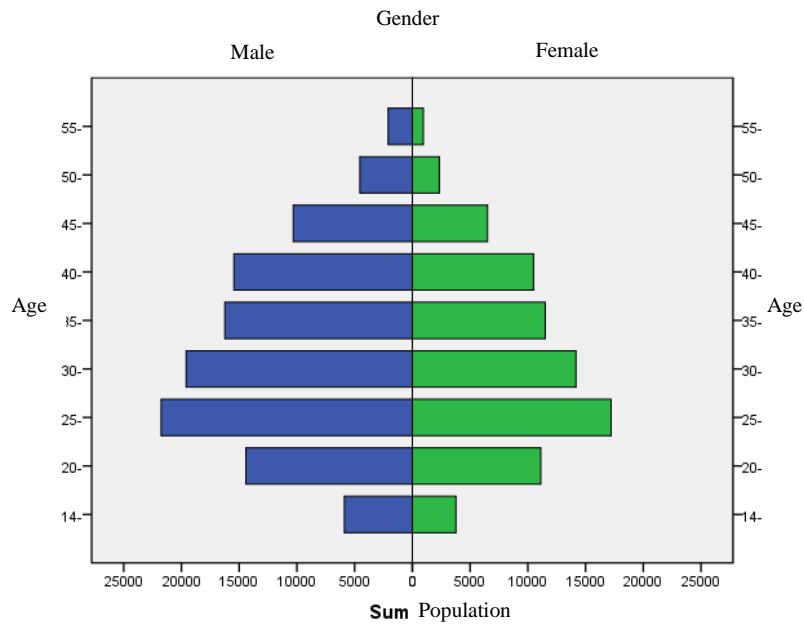Figure 1 Age pyramid of floating population in 2009.

Figure 2 Age pyramid of floating population in 2014.

3.2 Various Age Peak Performance in Different Regions

"Figure 3" shows that in 2009, the curves of the floating population aged 15-20 in Shanghai (first-tier city) and Chengdu (second-tier city) were similar, while the curves of the floating population in Beijing (first-tier city) and Taiyuan (second-tier city) were similar; The structure curve of Chengdu's floating population fluctuates greatly, with the lowest point being nearly 2.00% at the age of 25 and the highest point being nearly 5.00% at the age of 38. The floating population in Taiyuan reached its peak at the age of 27 and gradually decreased thereafter; The floating population in Beijing reached its peak at the age of 31, and then gradually decreased after reaching a small peak; The floating population in Shanghai reached its peak at the age of 36 and gradually decreased thereafter; The floating population in Shenzhen reached its peak at the age of 30, and gradually decreased after reaching a small peak; The floating population in Chengdu reached its peak at the age of 38, and gradually decreased after reaching its peak. The age group of floating population is mainly concentrated between 27 and 38 years old. It is worth pointing out that there is a significant difference in Chengdu's performance, with a lower proportion of the population before the age of 33 compared to other cities, and a higher proportion of people after that.

"Figure 4" shows that in 2014, the proportion of 15-year-old floating population in Taiyuan was higher than that in Beijing, Shanghai, Shenzhen, and Chengdu; The proportion of floating population in Beijing, Shanghai, Shenzhen, and Taiyuan, aged 26 to 32, is increasing, while Chengdu is actually decreasing in this age group; The floating population in Chengdu fluctuates greatly, with the highest point at the age of 23. The floating population in Beijing and Shanghai reached their peak at the age of 26 and 29, respectively, and then decreased and reached another peak. The floating population in Shenzhen reached its peak at the ages of 26, 29, and 32, and then gradually decreased and reached three peaks; The floating population in Chengdu reached its peak at the age of 24, while the floating population at the age of 30 decreased, followed by several peaks; The floating population in Taiyuan gradually decreases after reaching its peak at the age of 29, but there were also peak phenomena. The proportion of floating population in the five cities aged 53 to 59 was almost the same. The age group of floating population in 2014 was mainly concentrated between 26 and 32 years old.
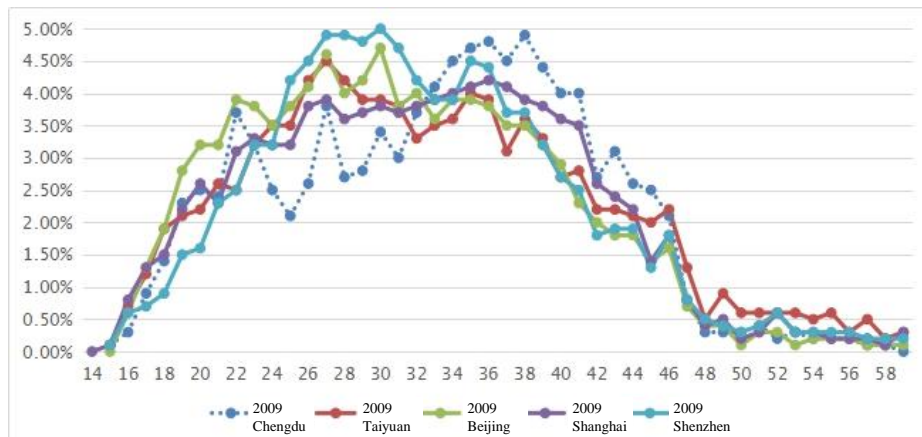
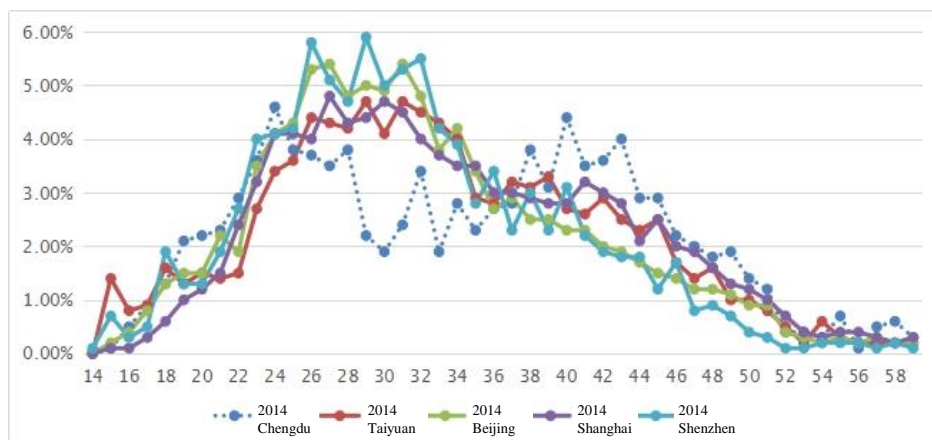Figure 3 Age-specific structure analysis of floating population in 5 cities in 2009.

Figure 4 Age-specific structure analysis of floating population in 5 cities in 2014.

3.3 Age Peak Changing from Single-headed to Double-headed

From "Figure 5", it can be seen that the floating population in the age range of 14 to 28 years old showed a continuous upward trend in 2014 and 2009, and a decreasing trend after 28 years old. At the age of 36 years old, the floating population in 2009 was 1.5 percentage points higher than in 2014. In 2009, the proportion of floating population aged 33 to 43 was higher than in 2014, while the proportion of floating population aged 42 to 46 was lower than in 2014.
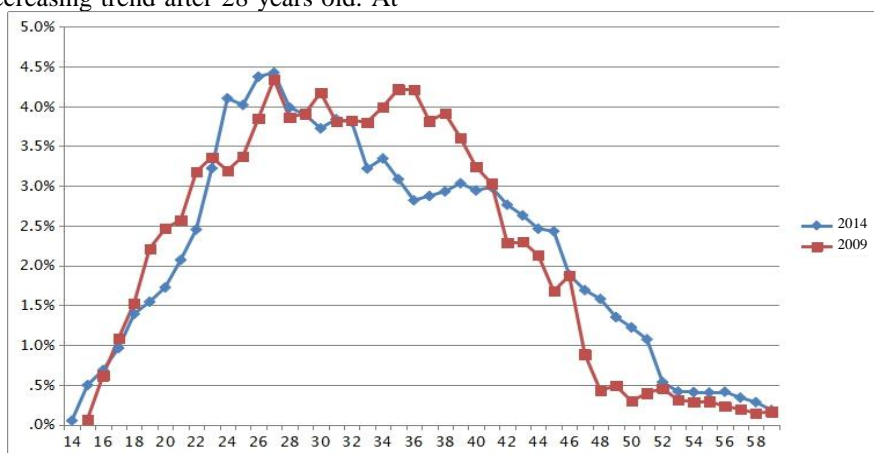

Figure 5 Age-specific structure analysis of floating population.

3.4 The Widening Age Distribution Gap Between Different Genders

From "Figure 6", it can be seen that the floating proportion of females was higher than that of males. From a detailed perspective, there are two peaks in age, 24 to 30 years old and 32 to 38 years old. The floating population has been continuously decreasing since the age of 42. The overlap between the ratio of male to female floating population in 2009 and the curve of floating population in 2014 indicates that the male to female floating population is similar in a certain age group.
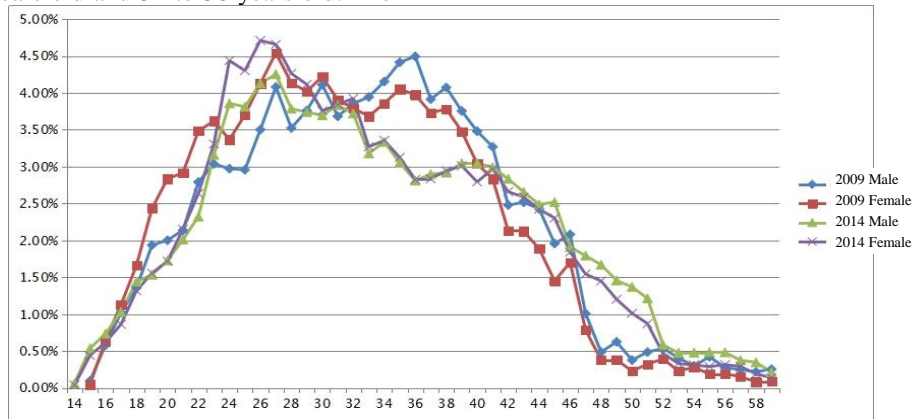

Figure 6 Comparative analysis of age groups by gender in 2009 and 2014.

3.5 The Widening Age Structure Difference Between the Inflow and Outflow of Migrant Population in Major Provinces

From "Figure 7" and "Figure 8", it can be seen that the trend of the proportion of floating population in Taiyuan and Chengdu in 2014 and 2009 was similar. However, the proportion of floating population in Chengdu between the ages of 32 and 39 in 2009 was much higher than that in 2014. In the age range of 46 and 58, the proportion of floating population in 2009 was actually lower than that in 2014.

For central regions (Shanxi, Anhui, Jiangxi, Henan, Hubei, Hunan), in recent years, with the implementation of the central and western development strategy, China's central and western regions are entering a track of rapid economic development. The gradual inclination of national investment policies towards the central and western regions, coupled with the utilization of their resource advantages to attract foreign investment, has to some extent expanded employment opportunities in the central and western regions. The income level of local residents has also increased, and many laborers are gradually willing to stay in the central and western regions for survival and development, which reduces the quantity and speed of labor outflow from the central and western regions. The outflow of population has decreased.
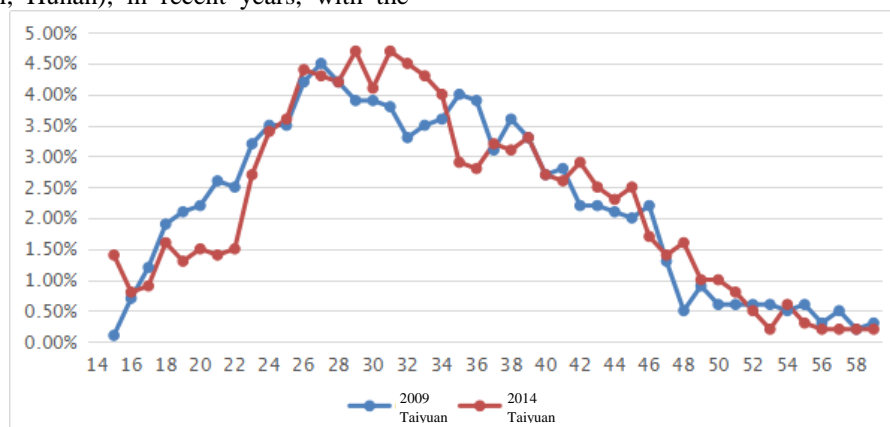

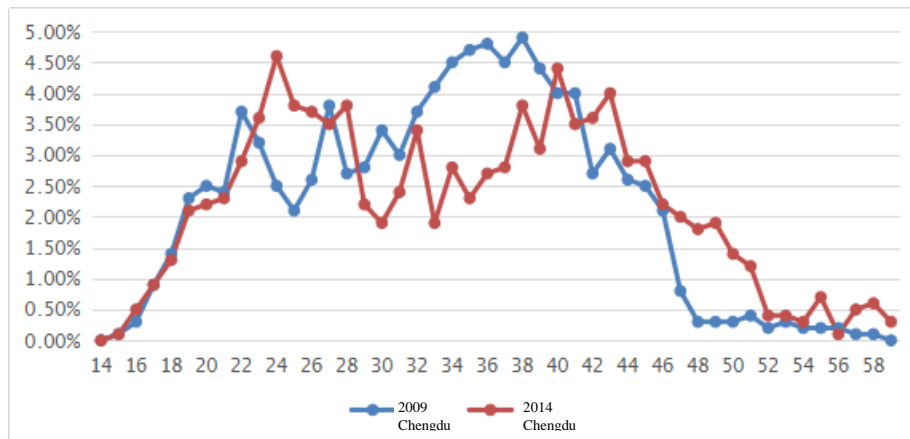Figure 7 Age-specific structure analysis the floating population in Taiyuan over the past two years.

Figure 8 Age-specific structure analysi of the floating population in Chengdu over the past two years.

From "Figure 9" and "Figure 10", it can be seen that the proportion curve of floating population in Shenzhen and Beijing is similar. From 23 to 32 years old, it first rises to a peak and then fluctuates repeatedly, until it stabilizes and decreases after the age of 48. Moreover, the population inflow in these two regions for 14 years at this age stage is higher than in 2009. This indicates that most of the young people in the two regions are emigrating, and they are more willing to work in economically developed areas, with greater opportunities, development space, and a higher likelihood of career success. Between the ages of 34 and 42, the proportion of floating population in Beijing and Shenzhen showed a decreasing trend in 2014, which was lower than the proportion of floating population in 2009. This indicates that older people are less willing to go around and are more willing to settle down and stabilize their lives without running around.

Comparing the proportion of floating population in Shenzhen and Shanghai, it can be seen that the trend of floating population proportion in Shenzhen and Shanghai was similar, especially in the age range of 22-32. The proportion of floating population in Shenzhen and Shanghai in 2014 was higher than that in 2009, while in the age range of 34-40, the proportion of floating population in Shenzhen and Shanghai in 2009 was higher than that in 2014. The difference was that in the age range of 14-22 and the age range of 41-59, the proportion of floating population in Shenzhen in 2009 tended to be balanced with that in 2014, while in Shanghai, the proportion of floating population in the age range of 14-22 in 2009 was slightly higher than that in 2014. In the age range of 41-59, the proportion of floating population in 2009 was lower than that in 2014.
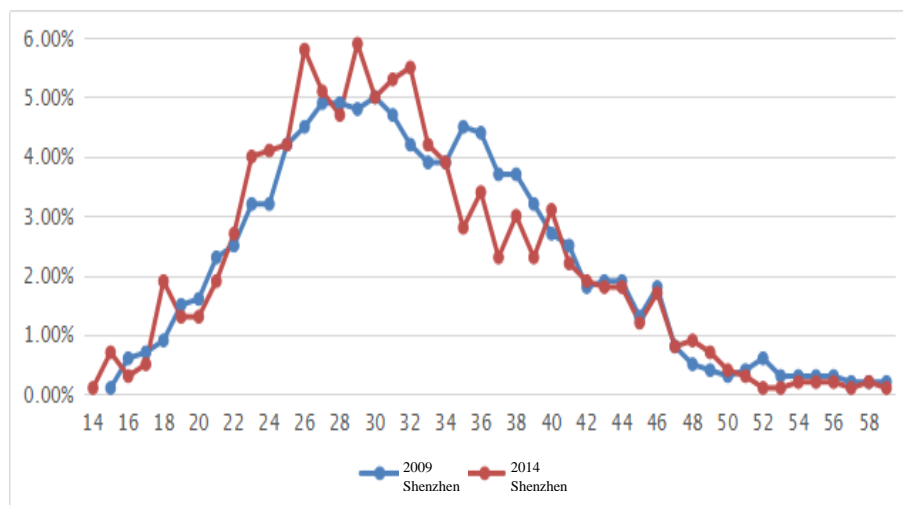

Figure 9 Age-specific structure analysis of Shenzhen's floating population in two years.
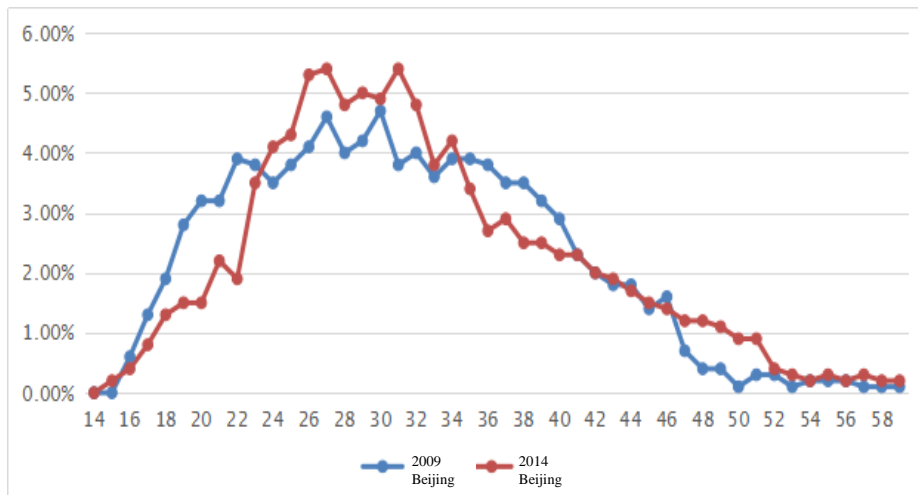
Figure 10   Age-specific structure analysis of Beijing's floating population in two years.

From "Figure 11", it can be observed that the proportion of floating population in Shanghai in 2009 showed a secondary fluctuation trend of first increasing and then decreasing, and then increasing and then decreasing.
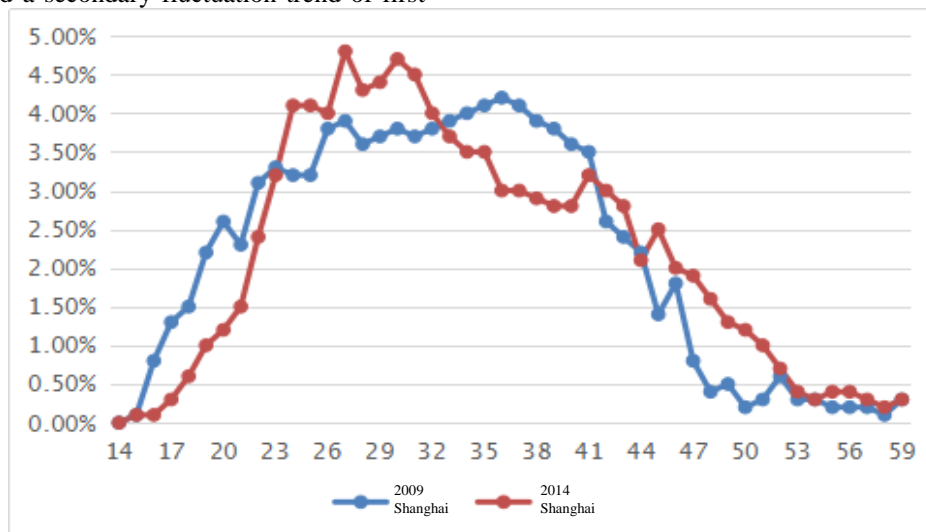

Figure 11   Age-specific structure analysis of the floating population in Shanghai over the past two years.

Shanghai is one of the first coastal open cities in China, and Shenzhen is the first economic special zone established by China's reform and opening up. It is a window for China's reform and opening up, and has developed into an international city with a certain influence. It has created a world-renowned "Shenzhen speed" and is also known as the "City of Design", "City of Piano", and "City of Maker". From the perspective of labor resources within coastal cities, the economic development of coastal cities is fast, and people's living standards are high. Most of them have reached the "well-off" level. The economic development level of the Pearl River Delta and southeast Fujian (43 counties under the jurisdiction of five cities, Fuzhou, Xiamen, Zhangzhou, Quanzhou, and Putao) is among the best in the country. At this standard of living, food and clothing are no longer the most important issue. People pursue improving their quality of life, and they pay more attention to self-development. Therefore, the low wages brought by engaging in frontline (grassroots) work are no longer very attractive to the younger generation in coastal cities, and the labor pressure and working environment faced by frontline work make the younger generation hesitate.

Although coastal cities do not have much appeal to local young people, they have a relatively high appeal to young people in other economically

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underdeveloped areas. When the local economy can no longer meet the survival needs of young people, they will flow to cities with faster economic development

In recent years, China's education has developed rapidly, with high school enrollment rates and college entrance examination admission rates continuing to rise. The younger generation in coastal areas tended to study and work in large and medium-sized cities. This not only greatly delays the employment time of many young people, but also leads to a lack of willingness among the younger generation after receiving university education to choose frontline (grassroots) jobs. Therefore, the increase in labor force within coastal areas has greatly decreased. So, most of the labor force in developed coastal areas comes from the central and western regions. From 2009 to 2014, after several years of experience and financial accumulation, many laborers in the central and western regions, who have worked in coastal areas for a long time, have accumulated some capital after more than a decade of work. They are unwilling to engage in the simplest and most difficult low-level jobs anymore, but instead return to their hometowns to independently invest in industry and commerce.

Most of the incoming population, especially those from the central and western regions who have worked in coastal areas for a long time, have accumulated some capital after more than a decade of working or shorter working life. They are unwilling to engage in the simplest and most difficult low-level jobs anymore, and instead return to their hometowns to independently invest in industry and commerce.

It is also possible for some of the incoming population to settle in coastal areas, relying on their savings for over a decade for small-scale investment and independent business operations. The floating population the age of over 40 in 2014 was higher than that in 2009.

3.6 Young and Middle-aged Labor Force Tending to Move Across Provinces and Cities, with the Largest Age Range of Cross-county Flow Within the City

As shown in "Figure 12", the proportion of cross provincial floating population before the age of 30 was gradually increasing, and it begins to decrease after the age of 30; The sharp upward trend in the age range of 22 to 27 indicated that people in this age group are mentally mature, have more independent opinions and views on employment, and may also have just entered society. Being too young and lacking employment experience makes it difficult to find employment in local enterprises, leading to a greater willingness to seek employment in other places. The proportion aged younger than 22 of cross city floating population was much higher than that of cross-province floating population. Being too young, having the necessary conditions to leave the province, and insufficient preparation will lead people in this age group to choose a more secure approach, which is cross-city flow; The proportion of inter provincial and inter city floating population aged 22 to 24 was close; The proportion of cross city mobile population aged 25 to 36 is much lower than that of cross-provincial floating population; The proportion of people aged 37 to 47 who cross cities to the east was higher than that of those who cross provinces. People in capital letters tended to follow the principle of proximity and seek to work in areas close to their local area. They were less willing to develop in areas too far from home and prefer to stay close to their home and keep abreast of their current situation; The proportion of cross provincial and cross city mobile population after the age of 47 was close, and people's lives in this age group have stabilized and settled. The nature of work and the economic impact it brought were also not as significant, which was one of the reasons why there was not much fluctuation in this age group.

The proportion of cross-county floating population in the city fluctuated several times before the age of 26, and then rapidly increased from the age of 22 until the age of 24. The upward trend of population at the age of over 25 fluctuated and decreased significantly, until it reached a stable state after the age of 49.
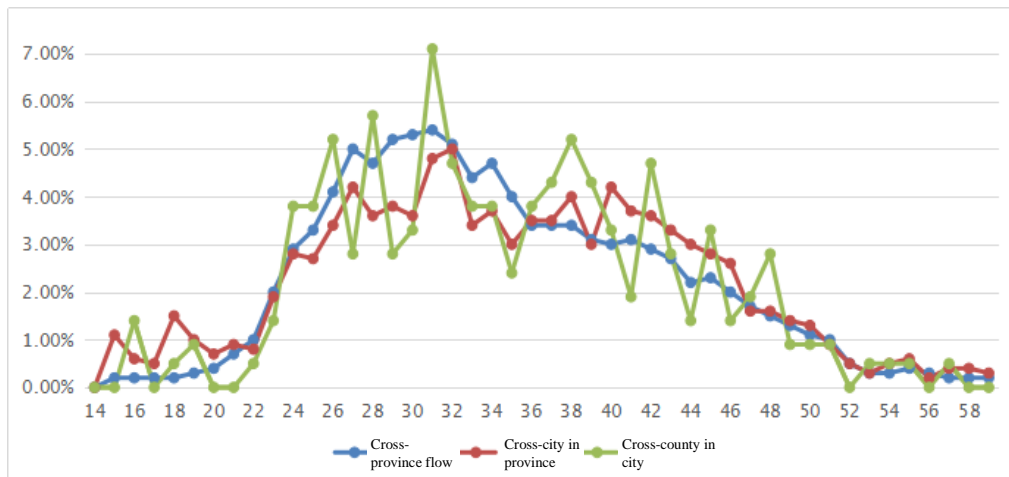
Figure 12   Comparative analysis of the mobility range of floating population in 2014.

3.7 The Increasing Average Age of Unmarried Individuals, and the Decreasing Average Age of Widows

From "Figure 13", it can be seen that the average age of unmarried individuals has significantly increased, from around 22 years in 2009 to around 37 years in 2014, with a span of about 10 years. In 2014, the number of unmarried elderly individuals was relatively high, while their first marriage and remarriage were almost identical in the past two years. The average age of divorced individuals has decreased significantly, from around 37 years to around 24 years in 2014. The average age of widowed individuals has also decreased significantly, from around 45 years to around 27 years old. The national policy of late marriage and late childbirth is one of the reasons for the significant increase in the age of unmarried individuals, and it is also related to the shift in the concept of marriage among migrant populations towards starting a family first and then starting a career, with a greater emphasis on pursuing a family and marital status based on material living conditions. The significant decrease in the average age of divorced individuals was also related to economic and social development. The degree of openness in society has changed traditional concepts of marital relationships, and there is more freedom in marriage.
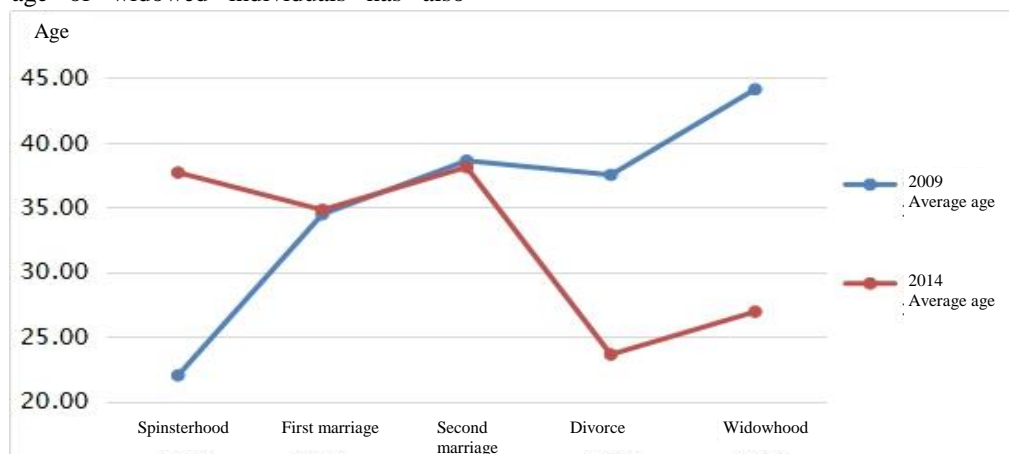

Figure 13   Comparative analysis of average age of various marital conditions.

3.8 The Floating Population with the Reason of Working and Doing Business Having the Largest Age Range, While the Population with the Reason of Seeking Family Showing a Three Peak Trend

It can be seen from "Figure 14" that the proportion of migrant population aged younger than 27 leaving registered residence for the first time was mainly concentrated in accompanying migration, followed by family defection, which is significantly higher than that of agricultural economy and commerce. The main reason for the moving of the floating population aged 20 to 23 and 25 to 26 was due to seeking relatives, followed by accompanying the movement to engage in agriculture and business. This indicated that the majority of the floating population move around in a family style with their families and children, and seek development and employment opportunities by seeking relatives. The main reason for the mobility of the floating population aged from 27 to 48 years old was agriculture and business, and the proportion of the floating population is significantly different from that of accompanying mobility and joining relatives. Among them, the proportion of the floating population joining relatives fluctuated the most, with a sharp and repeated decline and increase. At this age, the marriage status of the floating population was initially beginning to stabilize, and the main purpose of agriculture and business was to stabilize the family's stable life. After the age of 48, the proportion of migrant workers engaged in agriculture and commerce was close to that of those who move with them, while the proportion of migrant workers who seek relatives still fluctuated up and down, showing an overall upward trend, and the proportion of migrant workers was much larger than that of those engaged in agriculture and commerce and those who move with them. This indicated that the economic motivation for working and doing business is still the main reason for mobility.
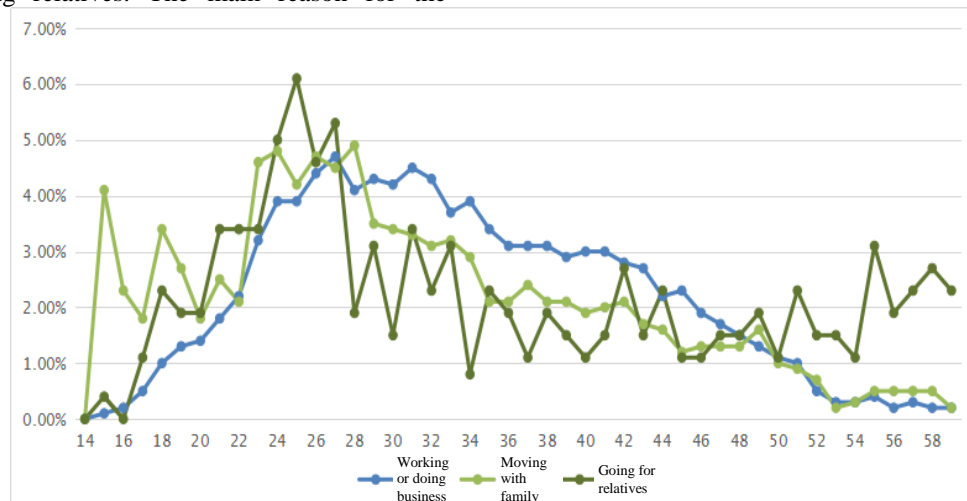

Figure 14　　　　Age-specific analysis of reasons for the first time of migrant population leaving registered residence in 2014.

4. CONCLUSION

First, the structural characteristics of the shortage of migrant workers have been highlighted. Due to the age dispersion of the floating population, there has been a significant decrease in the floating population aged 30-40. The floating population is no longer younger, but also shows the characteristics of an aging population. More and more older migrant workers are flowing into cities, mostly male. This also indicates that left-behind women are increasing. The young and middle-aged floating population is highly concentrated in developed coastal cities, and as a major province and city that attracts floating population for a long time, it still has strong attraction. As a long-term outflow of floating population from major provinces and cities, it attracts more elderly floating population.

Secondly, the possibility of urbanization nearby has increased. The distance between young and middle-aged migrant populations is the largest, and they mainly move between provinces and cities within the province. For nearby cities, there is a higher likelihood of cross county flow among

different ages, and older individuals tend to move closer. Therefore, it can be expected that as the floating population ages, nearby urbanization is more likely. As people age, as their knowledge and resume reach a certain level, they often settle down. As the saying goes, a good newborn calf is not afraid of tigers, and young people hope to explore more when they are young. The proportion of mobile population moving across provinces before the age of 30 is gradually increasing, and it begins to decrease after the age of 30. Economic motivation remains the main reason for mobility, however, the age characteristics of the floating population who seek family leave reflect that the floating population aged 15-20 and above 48 has become the main group for seeking family leave. Their education and elderly care needs in the city will inevitably become an area that needs attention.

Thirdly, the issue of marriage among floating population has reflected intermarriage barriers. The significant increase in the average age of unmarried individuals indicates that the result of flow behavior may lead to a large number of leftover men and women. Previous studies have shown that there are many obstacles to intermarriage between floating population and those from the destination. So how to solve their marriage is an important issue in the new urbanization path.

ACKNOWLEDGMENTS

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