

The impact of population aging on economic growth —— Based on a case analysis in Beijing

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Abstract. Aging is an urgent and important issue for the long-term development of countries in the world. As China's elderly population continues to increase, China's aging has had many impacts on social production and life. This paper analyzes the development process and current situation of aging in Beijing, presents the severity of aging in Beijing through indicators such as the total number of people over 60 years old, the dependency ratio of aging, and summarizes the three effects of aging on economic development: inhibiting residents' consumption, reducing economic benefits of labor force, and optimization of industrial structure. According to the influencing factors, targeted solutions are given improve the security system for the elderly, optimize the layout of the pension industry, adjust the concept of fertility, and promote the development of education for the elderly. In this way, people can break the restraining effect of aging on economic development and drive new economic growth.

Keywords: aging, economic growth, consumption, industry structure.

1. Introduction

According to a large number of domestic and foreign studies, Mohd Siti Nur Ain found that there is a significant negative correlation between aging population and economic growth of Malaysia [1]. Therefore, the economic development of Malaysi will be hampered by aging. As for the specific influence path and empirical analysis, many scholars have also carried out relevant research. Hu Angang based on provincial data in China, established the expanded Solo model to study the supply of labor force is affected by the aging of the population, and affected economic growth based on this channel [2]. The conclusion indicate that the increased proportion of the working population is conducive to economic development. Wang Wei believes that the increased pension burden caused by the aging population will increase capital investment and have a bad effect on industrial structure and the economy as well [3]. Based on the perspective of financial sustainability, Cao Congling analyzed that population aging is positively correlated with economic development when financial sustainability is the intermediary variable, but with the deepening of the degree of aging, the positive effect is gradually weakened [4]. Similar research include Wang Yingying [5]. After an empirical analysis of the Guangdong-Hong Kong-Macao Greater Bay Area, she found that before moderate aging, the aging population had a restraining effect on the economy, and after moderate aging, it had a positive effect on economic growth. Yang Peng took Henan as the object of analysis to study the influence of aging on economy and calculated the effect on the aging population on industrial structure and labor market through econometrics analysis, so as to get the contribution rate of aging to economic growth and give targeted policy suggestions [6]. From the perspective of action mechanism, Cheng Jin and others analyzed the relationship between aging and economic development from the three aspects of pension system, population structure change and economic resource allocation, and believed that the development of aging would bring some negative effects to economic development [7]. Huang Li focuses on the impact of geographical location changes on aging and economic growth [8]. Through the econometrics analysis of the population and economic data of 31 provinces, the author concluded that aged population and economic expansion go hand in hand. Shen Wei analyzes how aging deeply affects the development of the silver industry with the help of specific regions, and makes path planning for the future development trend according to the demand [9]. The author thinks that the current regional heterogeneity of aging and economic growth

is fully discussed, but there are still insufficient, the existing literature research more attention to a certain index reaction of economic growth, and the lack of practical research for different regions, the influence mechanism of lack of pertinence, policy advice implementation is poor. So in this paper, for example, author using the way of case analysis to explain the impact of an aging population in the Beijing economy, combined with the development path of the pension industry, applied to the actual development strategy, Beijing from theory to practice, causes to the influence of complete case analysis. It is a reference for future scholars.

2. Population background of Beijing

2.1. Development status of population aging

Combined with international standards for population development and the availability of population data in Beijing, this paper selects the population over 65 years old to represent the elderly group to measure the degree of aging in Beijing. According to the United Nations, an area or nation enters an aging society when the proportion of individual over 65 in it exceeds 7% of the overall population. A population is considered to be considerably aging when the percentage of people over 65 exceeds 14%.

As the capital of China, Beijing plays an important role in China's development in the fields of political activities, cultural life and economic construction. The best method to address Beijing's aging issue and advance long-term social stability and steady growth is to define the city's existing aging status, learn how it affects the economy, and propose remedied in line with those findings.

2.2. Overview of the elderly population

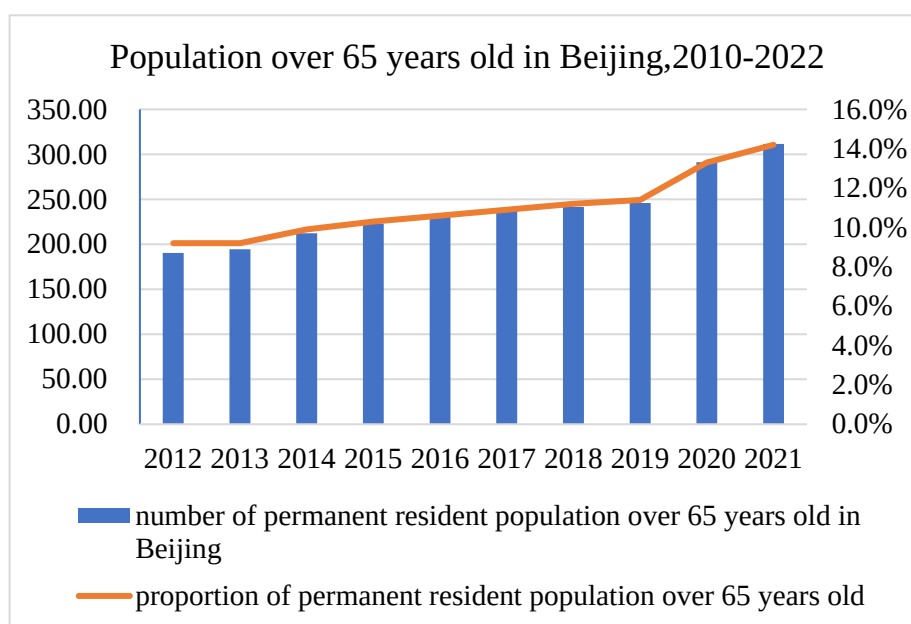


Figure.1. Population over 65 years old in Beijing,2010-2022

Due to time constraints, 2022 data is temporarily unavailable. So this paper selects the population data from 2012 to 2021 for analysis. The above figure shows the development of the population aged 65 and above in Beijing in the past 10 years. The figure present that the aging population is increasing year by year, and the growth rate is gradually accelerating. In 2012, the proportion of the elderly was only 9.2%, while in 2021, it was as high as 14.2%. In 2021, the share of the elderly in the total population in Beijing more than 14% for the first time, marking that Beijing has officially entered a moderately aging society.

Another characteristic of the aging problem in Beijing is that the gender ratio is not balanced, and the proportion of female elderly is higher than that of male elderly. By the end of 2021, among the registered residence population over 60 years old, there will be 2047000 women and 1836000 men, with a sex ratio of 89.7. In addition, the sex ratio even dropped to 77.4 among the elderly over 80 years old, and women's life expectancy was far greater than that of men. It fully shows that the aging age difference in Beijing is obvious.

According to the Beijing Statistical Yearbook and Development Report on the cause of aging, Beijing's birth rate has declined continuously for many years, and the number of births has reached a new low in nearly 10 years in 2020. With the continuous progress of science and technology and the change of people's lifestyle, the mortality rate in Beijing is decreasing and the life expectancy is increasing. Against the background of a large population base, the double-low phenomenon of low birth and low death and high life expectancy accelerate the change of Beijing's population structure. This exacerbate the problem of population aging.

2.3. Old-age dependency ratio

Table.1. Beijing elderly dependency ratio, 2012-2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Dependency ratio of elderly population	19.1%	19.8%	20.2%	21.4%	22.5%	23.2%	24.8%	26.8%	28.3%	30%

The dependency ratio of the elderly is calculated based on the population aged 15-64 working age supporting the population aged 65 and above. Table 1 clearly shows that the dependency rate of the elderly in Beijing has risen rapidly over the past 10 years, which means for the working population from 19 per 100 to 30 per 100 now. Many young people are very stressed out to raise their children. The aging problem in Beijing has becomes an urgent problem.

2.4. Regional differentiation

The regional distribution of the elderly in Beijing is significantly different. Statistics Bureau data show that the proportion of the elderly in central urban areas is large, while that in remote areas is relatively small. In 2021, the resident elderly in the central urban area will increase by 84000, or 3.5%, compared with 2021; The resident elderly population in the suburbs increased by 33000, or 1.7%.

3. The impact of aging on the economy

3.1. Inhibit residents' consumption

From the demand side, consumption, investment and export are the "troika" driving economic growth. The contribution rate of China's final consumption expenditure to economic growth will reach 65.4% in 2021. Affected by the epidemic, consumption contributed 32.8% to the economy in 2022. It can be seen that consumption is one of the main ways to drive the rapid development of the economy, regardless of the environment.

Liu Shenglong concluded through the analysis of China's provincial data that the national life expectancy is positively correlated with the household savings rate [10]. With China's continuous attention to the improvement of national health quality, life expectancy has been effectively improved. On the basis of the statistics released by the China Health Commission, from 2015 to 2022, the life expectancy in China increased from 76.3 to 78.2 years.

There are two types of savings. The first is passive savings. The epidemic era has led to a reduction in consumption of education, entertainment, catering, tourism and other services. Even if the income remains unchanged, the reduction in clearing fees means an increase in savings. The second is active saving. Various uncertainties caused by the impact of the epidemic have increased, and people are

more worried about the future. Therefore, residents' precautionary savings motivation is strengthened, and they can prevent various risks by increasing savings.

With the growth in the older population in Beijing, consumption structure of Beijing has changed. The elderly group has weak demand for material consumption, entertainment culture, food experience and other aspects. Affected by the epidemic and the continuous improvement of health concept. The demand of the elderly for medical services and health facilities is increasing. This has led to the majority of elderly families not spending in time after receiving pension, but to increase preventive savings. The high savings rate means that residents' consumption intention is low, which undoubtedly is a big blow to the economic expansion of Beijing.

3.2. Reduced economic benefits of labor force

On January 17, 2023, the China Bureau of Statistics released data that the total population of China in 2022 is 1.411 billion, 850000 fewer than that in 2021. China has become the first negative population growth in 61 years. According to China Human Capital Report 2022, from 2001 to 2020, the mean age of work force rose from 35.3 to 39. China's labor market is in a state of lack of supply.

Previous studies have shown that there is a significant negative correlation between population aging and labor force participation rate, and the size of the labor force continues to decline [11]. According to the relevant data of the Beijing Municipal Government, the number of new urban employment in Beijing has continued to decline since 2018, from 423000 to 261000 in 2022. The aggravation of aging and fewer children have led to a permanent reduction in Beijing's labor supply. Behind the shortage of work force is the slowdown of economic growth in Beijing.

Existing literature studies have found that the increase of labor participation rate has a positive impact on economic growth [12]. The rapid aging of the population's age structure will first lead to the weakening of the labor force's receptivity; Secondly, it makes the enterprise lack of innovation, the staff structure of the enterprise is aging, and the lack of young employees is easy to cause conservative thinking. Without technological innovation, enterprises will not have the power to develop and will not drive the rapid economic development. Finally, the aging has made the original population dividend of Beijing disappear, and then turned into a population burden, which inhibits economic growth.

3.3. Optimize the industrial structure

Relevant literature research shows that the formation of social aging has a good influence on employment in the tertiary industry [13]. In recent years, China's economic growth has slowed down and entered the new economic normal. The upgrading of industrial structure is the main challenge facing China. The phenomenon of population aging in Beijing is becoming increasingly obvious, and the huge market space released by it has also made the pension industry become a "sunrise industry". Rural pension, residential pension, community pension and other ways have led to the restructuring of the tertiary industry, and the number of pension service industries has increased, which further promotes the transformation and development of the tertiary industry. The rapid development of the pension industry has become a new economic growth point of the tertiary industry in Beijing. Take the silver industry of the nursing home as an example: a sound nursing home needs various social resources such as supporting medical teams, high-quality nursing services, professional nursing institutions, advanced information management systems, etc. The perfect integration of these resources can make the best use of the nursing home. According to relevant estimates, the scale of China's pension industry will reach 21.95 trillion yuan by 2050.

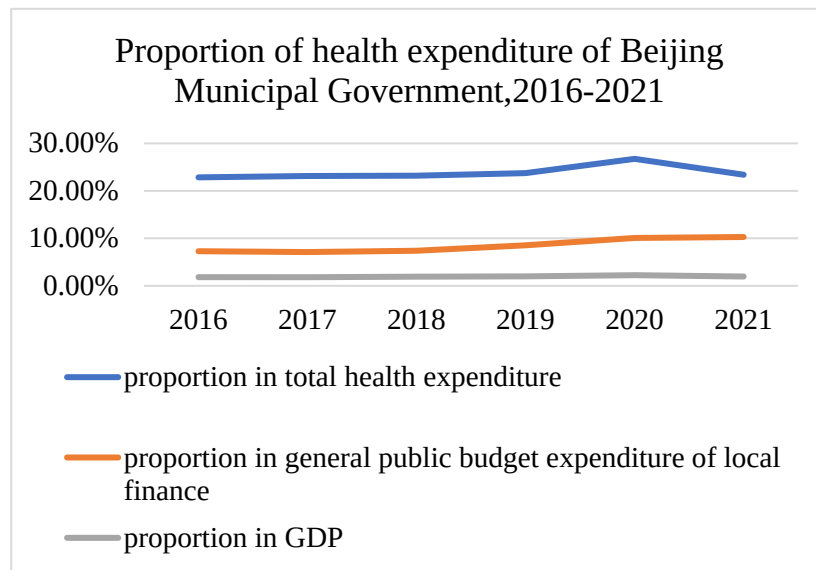


Figure.2. Proportion of health expenditure of Beijing Municipal Government, 2016-2021

The health of our population is an important symbol of our nation's prosperity, and medical and health care is an important livelihood cause to ensure people's health. Figure 2 shows the relevant situation of Beijing Municipal Government's health expenditure. Affected by Beijing's aging population, the government is also strengthening its guiding role and adjusting the direction of social and economic development in a timely manner. The government's expenditure on medical care, old-age care and public health will help promote more social capital inflow and accelerate the adjustment of industrial structure. On the whole, the government's expenditure on health shows an increasing trend.

4. Solutions to the impact of aging on the economy

4.1. Improve the security system for the elderly

We will fully integrate national management, personal insurance and social and commercial insurance, give full play to Beijing's unique geographical information advantages, improve the medical management system, and accurately analyze the needs of the elderly with the help of cloud computing, big data and other advanced technologies, so as to make the government's financial support for medical public utilities more targeted. Pension helps to prosper the capital market. In the context of aging, a sound pension system can not only stabilize consumption expectations, but also promote technological innovation and develop long-term investment.

4.2. Deeply tap the effective market demand and optimize the layout of pension industry

Beijing has a wide area of masks, large geographical differences, and uneven age distribution of the elderly, so it is very important to develop personalized elderly needs. The division of the multi-level pension industry can stimulate the vitality of the market for the pension industry, promote the development of the tertiary industry, and drive the high-quality development of the economy.

4.3. Strengthen social education and optimize the concept of fertility

The government should strengthen people's education through social channels and constantly improve people's views on fertility. Only by improving people's fertility will we be able to alleviate the shortage of labor force brought by aging and promote the accumulation of human capital. In this way, the economic growth potential brought by China's population dividend can be exploited again.

4.4. Promote the development of education for the elderly

The elderly tend to have a narrow social range and weak ability to accept things. Therefore, it is very important to promote the re-education of the elderly. Relevant literature points out that strengthening higher education can enhance the positive impact of population aging on consumption upgrading [14]. Re-education can not only help the elderly improve their understanding ability and better integrate into the rapidly developing society, but also improve the quality of human resources of the elderly.

As a result, promote the development of education for the elderly can not only reduce the burden of social pension, but also stimulate consumption potential. Finally, indirectly promote economic development.

5. Conclusion

This paper takes Beijing as an example to analyze the influence of aging on the economy. It is clear that Beijing's aging population will have a negative impact on residents' consumption and labor efficiency, and finally affect the economic development of Beijing. At the same time, aging will improve the industrial layout and optimize the economic development model. The research in this paper will help Beijing to formulate the direction of future economic development and optimize policies. The data in this paper are mainly concentrated in Beijing, and the future research direction can be used to discuss other cities. In addition, empirical analysis is a good choice. By establishing an economic model, the contribution rate of Beijing's aging to the economy can be analyzed.

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