

The Impact of Population Aging on Employment

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Abstract. Under the background of the increasingly severe trend of population aging, its impact on China's labor market cannot be ignored. Based on China's population data and employment data from 2013 to 2022, this paper examines the specific impact of population aging on China's labor supply market and demand market through quantitative analysis and horizontal comparison. The results show that: in the labor supply market, population aging will reduce labor supply and increase labor cost, reduce labor participation rate and aging labor structure, and reduce labor quality and innovation ability; In the labor demand market, the trend of industry demand for the elderly is becoming very obvious due to the aging of the population, healthcare, health, leisure and financial services with a focus on pension management are experiencing significant growth, followed by increasing levels of technology and automation, and finally the growth of the service industry. In particular, those related to personal care and home services types of jobs saw growth. Accordingly, the Government should give full play to its macro-control function to ease the pressure of the aging population on the job market and promote the sustainable development of the labor market by encouraging the delay of retirement, increasing the birth rate, strengthening the health infrastructure and services, and the construction of the education system.

Keywords: China's aging population; employment; labor supply and demand.

1. Introduction

With the rapid development of the economy and society and the continuous improvement of medical conditions, the life expectancy of the population is extended, the birth rate is declining, and population aging has become one of the most important social trends in the 21st century. The World Population Prospects 2022 shows that the number of people aged over 65 is growing faster than the number of people aged under 65. The proportion of the global population aged 65 and over is expected to rise to 16% by 2050, from 10% in 2022. By then, there will be twice as many people aged 65 and over as there are children under five and almost as many children under 12.

According to the United Nations, a country or region is considered an aging society when more than 7 percent of its population is 65 years or older. According to statistics, China stepped into an aging society as early as 1999, and the aging trend is increasing, which means that China is facing an increasingly severe challenge of aging. In 2022, the number of people aged 65 and above in China already exceeded 200 million and is expected to reach 330 million by 2050. The accelerating growth of the elderly population not only changes the demographic structure but also has a broad impact on the social economy. First, in the labor market, the increase in the elderly population means a relative decrease in labor supply, which may pose challenges to labor productivity, labor force structure, and job market stability. Secondly, the continuous increase in the elderly population makes the demand for pensions and medical care constantly rise, which puts higher requirements on China's social security system such as pension and medical insurance. In addition, the aging of the population has also led to changes in the consumption structure. The elderly population differs from the young population in consumption habits and needs, which will impact market demand and industrial development. Therefore, the in-depth study of the causes and trends of population aging and its impact on the economy and society is of great significance for formulating scientific and reasonable coping strategies and promoting the sustainable development of the economy and society. Among them, the

influence of the aging population on the job market is particularly prominent, which has become an important topic to be studied urgently.

At present, many scholars have conducted extensive and in-depth research on the issue of population aging, but most of the research focuses on the impact of population aging on economic growth, labor productivity, and other macro levels, while there is no systematic research on how population aging specifically affects the supply and demand of the labor market. Therefore, by processing and analyzing relevant data disclosed through official channels such as the China Statistical Yearbook, this paper intends to reveal the internal relationship between population aging and the job market from the two dimensions of the supply side and demand side and put forward targeted policy suggestions on this basis, to alleviate the negative impact of population aging on China's job market.

Through the research of this paper, we hope to clarify the specific impact mechanism of China's aging population on the labor market, provide a scientific basis for the government to formulate relevant policies, and also provide some references for the academic community to further deepen the research on population aging.

2. The Impact on China's Labor Supply Market

2.1. Decreasing Labor Supply and Raising Labor Costs

Looking at China's labor supply market, China's employment-population in 2022 is 733.51 million, accounting for 51.9% of the total population. Compared with 2013, China's employment-population decreased by 29.5 million, and the total population accounted for a decline of 4%. The decline in the absolute number and relative proportion of the labor force means that the effective supply of the labor force in China is declining, and the rise in the old-age dependency ratio caused by the aging population is one of the important reasons for this phenomenon. Zhu Qing's research found that the increase in the old-age dependency ratio will reduce the supply of labor, reducing China's labor cost advantage, and then reducing the net export of China's products [1]. Maestas empirically obtained through the population data of American states that population aging will lead to the slowdown of labor force growth and the decline of labor productivity, where there is a functional relationship that every 10% increase in the aging speed, the growth rate of per capita GDP will decline by 55% [2].

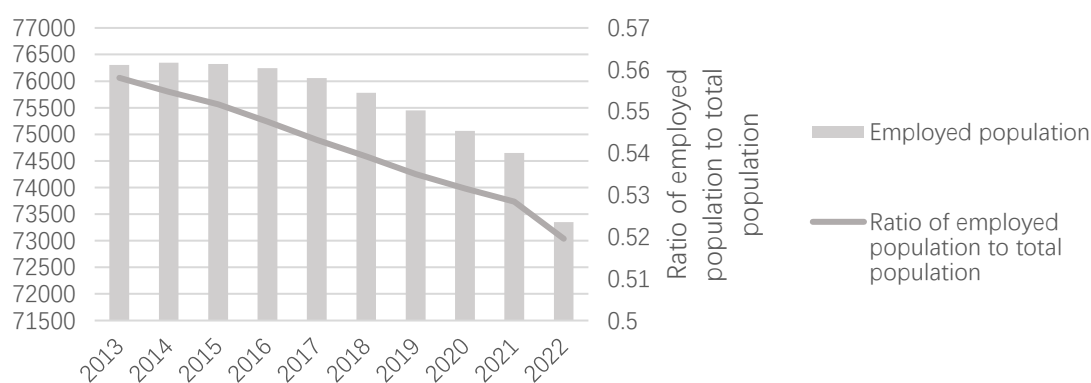


Fig. 1 The number of employed people in China and its ratio to the total population in the past ten years

The decline in labor supply will cause labor costs to rise. Shen Yongjian et al. believe that the aging population has enhanced the contagion effect of rising labor costs and will play a role at both the employee level and the enterprise level [3]. On the one hand, China's labor shortage caused by the aging population has made China's labor market develop from a buyer's market to a seller's market, and the bargaining power of employees has been continuously enhanced. On the other hand, the tightening of the talent market makes enterprises have to attract and retain high-quality employees by

increasing the wage level and welfare security, to increase their human cost. Figure 1 shows the number of employed people in China and its ratio to the total population in the past ten years.

2.2. Declining the Labor Force Participation Rate and Aging the Workforce Structure

By definition, the labor force participation rate is the percentage of the adult population in the labor force (both employed and unemployed). As shown in figure 2, China's labor force participation rate has shown a clear downward trend, which has fallen from 70 percent in 2013 to below 67 percent in 2022. At present, it is generally believed that the negative withdrawal effect and crowding-out effect brought by population aging will exceed the positive longevity effect, thus reducing the labor participation rate. For example, Tong Yufen et al. used the combination of population standardization and multiple linear regression to conclude that population aging, especially the aging of the working-age population hurts the labor participation rate [4]. Zhou Zhuping et al. further proved that there is a significant negative correlation between population aging and labor force participation rate through the domestic panel model and the international panel model [5]. Wang Huan et al. analyzed the degree of labor participation at each age from the perspective of the individual life cycle, and found that under the age of 25, the individual labor participation rate is relatively low, and between the ages of 25 and 44, with the continuous improvement of individual physical strength, it will continue to increase and reach the maximum; after that, the individual labor participation rate began to decline year by year due to the decline of individual physical strength and labor skills [6].

Population aging will cause the aging of the labor force population and further have a significant negative impact on total factor productivity. According to Harper and Hamblin, the aging of the population makes the government have to increase the expenditure for pension security, which will crowd out the expenditure originally used for technological innovation and scientific and technological development, which is detrimental to improving social labor productivity [7].

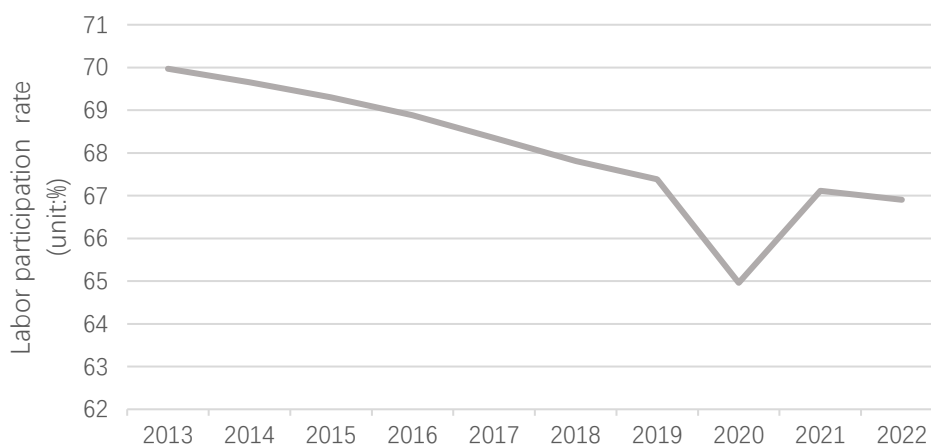


Fig. 2 China's labor participation rate in recent ten years

2.3. Reducing the Quality of the Labor Force and the Innovation Capacity

With economic development and technological progress, new industries continue to emerge, traditional industries are gradually declining, and the demand for talent in the labor market changes with each passing day. Cepar and Troha argue that an aging population will worsen labor quality as older workers become less productive, less flexible, and less skilled [8]. Under the market economy system, the scale of China's digital economy will reach 50.2 trillion yuan in 2022, accounting for 41.5% of GDP, and the digital economy has become a pillar of China's economic development. Therefore, the demand for digital skills of laborers in China's labor market is constantly increasing. However, most of the elderly employed population is generally digitally barren due to reduced learning ability and subjective emotional exclusion, which will not be conducive to the labor market to adapt to the changes in the economic situation, which will reduce the quality of China's labor force.

At the same time, Feyrer found that compared with workers aged 40 to 49, older people are significantly less innovative. Therefore, due to population aging, the shortage of young workers will hurt the country's innovation level [9]. For example, Michael found that the increase in the old-age dependency ratio would reduce the number of people who could be invested in research and development in economic production, which would be detrimental to the progress of social technology [10]. Guo Xibao et al. pointed out that the continuous development of an aging population will reduce the speed of labor productivity improvement and may lead to a decline in innovation momentum and hinder the process of scientific and technological progress [11].

3. The Impact on China's Labor Demand Market

The demographic shift towards an increasingly aged society is unprecedented, and China is matching the changing employment landscape, especially from the demand side. This section will discuss the shaping up of the employment demand by the aging population in China, the challenges before them, and strategies that could help in mitigating the impacts. Demographic change is another significant social effect: an aging population will create economic challenges for China. Population aging in China has been incurred through the four decades of the one-child policy and against its backdrop of vastly increased life expectancy and plummeting fertility rates. The National Bureau of Statistics of China records show, however, that the proportion of people who are 60 and above has surged over recent years, proving to present challenges not just to the pension system but to labor market dynamics. The workforce is declining, increasing due to retirement in the aging workforce. As the population ages, the number of people of working age shrinks, leading to a decline in labor availability and a rise in labor expenses due to increased demand [12].

And while they retire, the number to replace them with young workers that contribute to demand in the labor market is generally reducing due to past policies on birth control. This is, in turn, leading to a mismatch of supply and demand in the labor market. Those industries with labor-intensive work that traditionally characterize a young workforce will be most affected. For example, an aging population is bound to affect a myriad of key areas from an employment demand perspective. First, the trend in industry demand is becoming very clear towards those sectors that are meant for the elderly. Research on China, facing challenges similar to Netherlands with an aging population, reveals that as the old-age dependency ratio climbs, pension and healthcare costs will outpace tax revenue growth. This imbalance threatens to disrupt the equilibrium between future public spending and tax income [13]. Healthcare, wellness, leisure, and financial services with a focus on pension management are the ones experiencing growth. Of course, in line with this trend, it means that there are increasing job opportunities within gerontology, health, finance, and personal care for professionals. Second is technology and automation: Now that the number of working ages is decreasing, automation and harnessing technology are pushing to fill the labor gaps. This will, therefore, demand that IT experts and engineers be hired in order to create and retain these automated systems. This change will help fill up the labor gap, but at the same time, it needs high technology and robotic-skilled professionals from these sectors who are not within the present aging working populations. Third, service sector growth: Growth in the service sector, especially those relating to personal care and home service type jobs, will also further grow out of current labor force participation. This is because this sector generally employs many of the older workers who want to be employed in jobs that are not very physical.

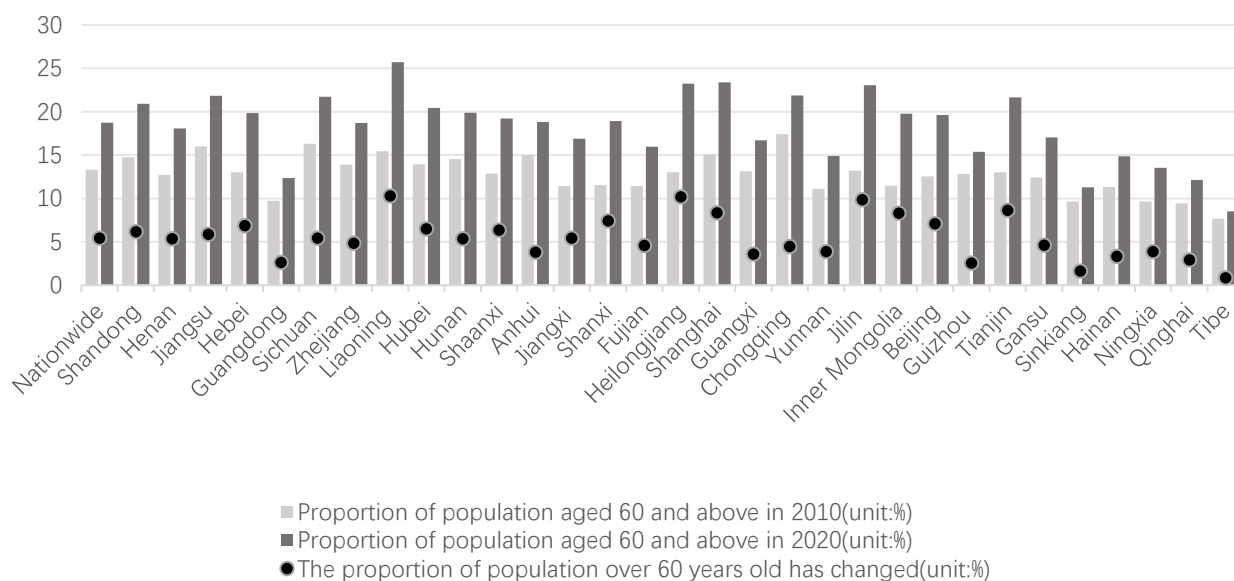


Fig. 3 Changes in the proportion of the population aged 60 and over nationwide and in major provinces (Compare 2010 and 2020)

Figure 3 shows the changes in the proportion of the population aged 60 and over nationwide and in major provinces. Therefore, employment in these areas might see less of an impact from the aging population. Finally, retraining and education to the workforce: the changed industrial landscape would require retraining and continuing education of the workforce. In an older workforce, the relevance of the job means the worker has to practice lifelong learning. On the other hand, business and governments may be set to put in much investment in adult education and skill development programs. The Chinese government should respond, of course, in a strategic way matching the real conditions, so the impact is lessened.

4. Conclusion

In conclusion, as China confronts the complexities of an aging population, the implications for its employment landscape are multifaceted and significant. This demographic shift, characterized by an increasing proportion of elderly citizens, presents both challenges and opportunities for the Chinese economy. To effectively navigate these changes, it is essential to implement a blend of adaptive strategies and proactive policies. Firstly, addressing the shrinking labor force requires innovative approaches to extend the working lives of older individuals. Raising the retirement age, where feasible, would help maintain a larger workforce and reduce the pressure on pension systems. Such a measure should be complemented by policies that ensure workplace environments are adapted to the needs of older workers, including flexible working hours and ergonomic interventions. Secondly, the education and training systems need a thorough revamp to support lifelong learning. By promoting continuous professional development and skills upgrading, older workers can remain competitive in the job market. This approach not only helps in retaining experienced individuals but also prepares them to handle new technologies and working methods that are becoming prevalent due to increased automation and digital transformation. Thirdly, there is a significant opportunity in the expansion of the healthcare and social services sectors. As the demand for healthcare services grows with an aging population, so does the need for healthcare professionals, caregivers, and support staff. Investing in healthcare infrastructure not only creates jobs but also improves the quality of life for the elderly, ensuring they can lead active and engaged lives. Furthermore, fostering a supportive environment for young families can help to gradually reverse the trend of low birth rates. Policies aimed at reducing the financial burden of childrearing, such as subsidies for education and childcare, can incentivize younger couples to have more children. Additionally, encouraging a culture that supports work-life

balance is crucial in making parenthood more appealing. Lastly, embracing technological innovation can provide solutions to labor shortages. Automation and AI can take over repetitive and physically demanding tasks, making jobs more accessible to older workers and increasing productivity. However, it is vital to ensure that the workforce is equipped with the skills needed to thrive in a more automated economy through targeted training programs. In a word, China's aging population requires a strategic and multifaceted response to mitigate its impact on employment. By leveraging policies that extend working life, enhance skill development, expand healthcare services, support young families, and harness technological advancements, China can transform demographic challenges into a springboard for sustainable economic growth and social stability.

Authors Contribution

All the authors contributed equally, and their names were listed in alphabetical order.

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