The Impact of Aging on Chinese Economic Growth and Reactions in Future 30 Years

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***Abstract*—Recently, as the problem of China's aging population has become more significant in the past two or three decades, a great deal of attention has been focused on the demographic phenomenon of population aging and its impact. This demographic change has resulted in increasing numbers of people who are over 60. According to data from the National Bureau of Statistics, the proportion of China's population aged 60 and over increased by 5.7 percent from 14.3 percent in 2012 to 20 percent in 2022. At the same time, the number of newborns fell from 16.35 million to 9.56 million. People are beginning to be aware that the serious issue of population aging keeps rolling in and cannot be ignored in the future, which stresses the need for research on the aging population. This paper studies the effects of population aging in Chinese society on China's economic growth, predicts the trend of future aging circumstances, and proposes corresponding measures to mitigate the aging of the population, which might increase social security rates, improve the quality of life of the elderly, and promote economic growth. Through the research process, the research synthesis method is used to do the comparative study among different literature.**

***Keywords*—economic growth, demographic change, population aging**

I. Introduction

China's aging problem has attracted worldwide attention over the past ten years. According to data from the National Bureau of Statistics, at the end of 2022, China's national population was 1.41 billion, and the population aged 60 and over was 280.04 million, accounting for 19.8%, of which 209.78 million were aged 65 and over, accounting for 14.9%. Compared with 2021, the population aged 60 and above increased by 12.68 million, an increase of 0.9 percentage points[1]; and the population aged 65 and over increased 0.7 percentage points. During the past 10 years, China has experienced a huge drop in the birth rate. As Culter *et al.* (1990) said, declining fertility is the key cause of demographic change. In fact, with the impact of decreasing birth rate, declining fertility and continuously increasing life expectancy, China is facing an increasingly severe issue of population aging. However, in terms of how serious the future aging issue will be in China, more research needs to be conducted. With a sounder prediction about the future aging issue, the analysis of the impact of the aging issue on Chinese economic growth will be more reliable.

Through long-term analysis, this paper will predict whether the aging of the population in China will become more severe or alleviated in the next 30 years, dividing the next thirty years into two phases, one for the first twenty years and the other for the last ten years. The reason is that in 1999, the Chinese government implemented the expansion of university enrollment, so that people born in the 1980s had a higher level of education and had a stronger ability to adapt when they entered old age, and the impact on economic development would be relatively small, which will be specifically analyzed in the Section III.

While some researchers believe that aging population has a positive effect on economic growth as it may stimulate investment in human capital (Futagami & Nakajima, 2001), others hold a pessimistic attitude towards it as population aging has led to a steady drop in the share of the working-age population (Liu & Hu, 2013), a rise in dependency ratio (Faruqee & Muhleisen, 2003) and social security burdens (MacKellar *et al.*, 2004). All these factors might contribute to a negative effect on economic growth. These studies with completely different results illustrate the complexity and seriousness of population aging. Therefore, a thorough discussion about the possible impacts of the aging issue on Chinese society is needed, especially on its economic growth.

Population aging and the increase in the ratio of old-age support will significantly increase the pressure on social security and public services. Meanwhile, the need for an effective supply of labor, and the weakened demographic dividend will continue to affect the society's innovation power and potential economic growth rate (Wang & Zhou, 2020). In this case, China has built a corresponding pension and social security system. The government has invested a lot of financial expenditure and human resources in medical services and elderly care services, such as the establishment of a pension system, which has a basic guarantee for the pension of the elderly. But the thing is, the seriousness of China's aging problem is unexpected, and although we have established a relative social security system to solve this problem, this does not guarantee that we will have enough infrastructure and funds to face the shock brought by an aging issue in the future. Therefore, more research on aging and the development of a pension system is needed.

This paper provides a thorough discussion of the three most important topics in terms of the future aging issues in China. Firstly, the factors that may affect population aging. Secondly, how the aging issue will be in the future of China? Thirdly, the impact of population aging on Chinese economic growth. Next, how should the government build a pension system to deal with the future aging issue? The research synthesis method is used to analyze the relevant topics. Besides, International comparison is involved in the research. This proposed research can provide an exhaustive review of the Chinese aging issue, which can help people learn about Chinese future aging issues from different perspectives, and can offer inspiration to policy designers.

[1] From the National Bureau of Statistics.

This paper finds out that in the next 20 years, the aging of the population will continue to severely affect economic growth, which is manifested in the decline of productivity, the difficulty of industrial transformation, and the pressure on the medical system and the elderly care system. The aging of the population will ease in the next decade. Therefore, the government should implement the two-child or three-child policy in the first 20 years to adjust the industrial structure and the structure of the pension system.

Section II of this paper covers a literature review of the concept of the aging issue, factors that influence population aging, changes in the age structure of the Chinese population and its impact, and China's existing pension system. The third part of this paper is about the prediction of how serious the aging issue is in the near future, its possible impact on economic growth, and the measures to relieve the aging issue and minimize its impact on the Chinese economy. Section IV is a summary of the paper. Section V is a review of the paper and the research process.

II. The Impact of Aging on Chinese Economic Growth and the Current State of the Chinese Pension System

A. Demographic Change

Demographic change refers to the investigation of how human populations change over time and its correlation with population growth[2]. Such changes may encompass shifts in population size, composition, and distribution according to the National Geographic Society. Factors such as birth rate, death rate, infant mortality rate, life expectancy, and net emigration are key contributors to demographic change. Demographic change is tightly interwoven with the economic growth of countries (Ahmed *et al.*, 2016). Alternations in demographic structure shape a country's population size, influencing the labor force, labor productivity, government spending, and other related factors. As such, it is imperative for governments and businesses to adopt effective measures to address demographic changes to drive sustainable economic development.

Particularly, demographic change in China has been a crucial concern due to its far-reaching implications for the nation's future development across numerous fronts. According to the forecast of the United Nations Population Division, under the medium scenario, China's total population will peak in 2022 at 1.426 billion. This indicates that China's population growth will soon turn into zero growth or a negative growth range. From the perspective of international comparison, China's population size advantage is gradually decreasing. Therefore, in China, demographic change is reflected in the falling birth rate and aging issue which has been one of the major concerns of the government and academia.

B. Population Aging

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1) Definition of population aging

Population aging is a phenomenon of demographic change, manifested in the gradual increase in the number of elderly people (Li & Zhang, 2015). According to the classification criteria established by the United Nations in 1956 known as "Population Aging and Its Socio-economic Consequences", a country or region is considered to have entered the stage of an aging population when the proportion of elderly people aged 60 and above exceeds 10% of the total population, and the proportion of those aged 65 exceeds 7%. In 1999, China's elderly population over 60 years old accounted for 10% of the total population, indicating that China had entered a period of population aging[3].

2) Age structure of the Chinese population

Population age structure refers to the distribution of people across different age groups and provides data on factors such as birth rates and death rates (Crossman & Ashley, 2020). Age structure is commonly depicted by demographic pyramids and age distribution charts (Ritchie & Roser, 2019).

There are basically three types of age pyramid structures: the stationary type, the expansive type, and the constrictive type. A stationary aging structure type, with both moderate birth and death rates gently sloping inward to have a rounded top indicates that the population is not growing. In expansive aging pyramids, the slope dramatically inclines inward and upward from the base, which shows that the population has both high birth and death rates, indicating a young and growing population. Lastly, the constrictive type has low birth and death rates, expanding outward from the base before sloping inward to achieve a rounded peak at the top, describing that the population is shrinking and in an elderly stage. It further categorizes individuals into different groups such as children, working-age individuals, and elderly individuals, enabling scientists to analyze social and economic implications (Crossman & Ashley, 2020).

In 2022, the population aged 0–14 accounted for 16.9 percent of the total population, the population aged 15–64 accounted for 68.2 percent, and the population aged 65 and over accounted for 14.9 percent. In contrast, ten years ago, in 2012, 16.5 percent of the population aged 0–14, 74.1 percent aged 15–64, and only 9.4 percent of the population were over 65[4]. By comparison, the population age structure pyramid has gradually transformed into a constrictive type[5], with the bottom shrinking and the upper part widening. This shows that China's population age structure is undergoing changes as the proportion of the elderly population increases[6]. Although China has been experiencing a significant demographic shift towards an aging population, it still has a considerable working-age population. This demographic proves beneficial to the nation's economic growth because it provides a large amount of labor force. A similar demographic shift has occurred in Japan, where the population is also constrictive type. Although China and Japan have longer life expectancy, they still face a decrease in labor force participation and other economic challenges. However, Africa's demographic structure is quite different,

[2] From National Demographic, https://education.nationalgeographic.org/resource/demography/

[3] From the National Bureau of Statistics

[4] From Statista 2023, https://www.statista.com/statistics/270163/age-distribution-in-china/

[5] From website https://www.populationpyramid.net

[6] From National Bureau of Statistics, https://www.stats.gov.cn/english/pdf/202010/P020201012524687421440.pdf

featuring an expansive population pyramid with the advantage of having more youth and working-age populations.

3) Factors contributing to population aging

Declining fertility and increasing life expectancy are the two main factors that lead to a rise in elder shares throughout the world (Bloom & Luca, 2016). The fertility rate stands out as a crucial indicator influencing whether a country transitions into an aging society (Urbanek *et al.*, 2023). According to the World Health Organization, the fertility rate is a demographic measure that represents the average number of children a woman is expected to have, typically between the ages of 15 and 49, based on birth rates within a specific population. It is calculated and expressed as the number of children per woman. After experiencing the first negative population growth in nearly 60 years in 2022, China's total fertility rate has declined to 1.09 in 2022[7]. However, a fertility rate of 2.1 is commonly considered the replacement level. If a country's fertility rate is below 2.1, it indicates that the country's population will continue to decline for an extended period (Craig, 1994). China is facing a significant challenge in terms of its low fertility rate, leading to fewer new births. The declining number of births in comparison with the growing number of older people contributes to an ageing population structure in China. China's constrictive population pyramid was shaped by child policies. Several decades ago, the Chinese government introduced the One-Child Policy Reforms, which had a sizeable influence on the demographic structure. In the 1980s, China's aging pyramid was expansive. In recent years, the government has replaced it with a two-child and even a three-child policy to deal with a shrinking labor force, low birth rates, and the challenges posed by an aging population.

In addition, increased life expectancy is also a major factor contributing to the aging of the population[8]. Advances in medical treatment, living environments, sanitation conditions, and nutrition have extended people's lifespans. As life expectancy grows, the proportion of the elderly population correspondingly rises.

4) Negative impact of population aging on economic growth

Most of the research studies show a negative correlation between economic growth and population aging. It is estimated that the aging of the workforce will deepen in the next 30 years, with the median age increasing from 39 years in 2018 to 43 years in 2049. It is predicted that from 2018 to 2050, the working population aged 15–24 will decrease from 162 million to 131 million, and the working population aged 25–54 will decrease from 664 million to 463 million (Bai & Lei, 2019). From the perspective of labor productivity, population aging not only leads to a decrease in the total number of the working-age population but also results in an aging age structure of the working-age population. Maestas, Mullen, and Powell (2023) suggest that in the United States, every 10 percent increase in the population proportion aged over 60 years old results in a 5.5 percent decrease in GDP per capita growth. Particularly, 2/3 of the impact on economic growth due to population aging is attributed to a decline in labor productivity growth.

The decline in the birth rate slows down the growth rate of the new labor force and the number of young workers in the labor market, inevitably leading to an increase in the average age of the labor force. These effects affect social labor productivity as elderly individuals may not be able to work as efficiently as they used to. While the elderly bring rich experience to production and can play a guiding role, the negative effects of an aging labor force on productivity cannot be ignored. Since China has an economic structure that is dominated by labor-intensive industries, the physical strength of workers plays a significant role in improving labor productivity. What is worse, it is challenging for the elderly to accept and adapt to new knowledge and technology. With the accelerating and continuous development of social science and technology, the social division of labor becomes more complex, requiring the labor force to have strong adaptability and a relatively new knowledge and technology structure. Therefore, the aging of the population, which leads to an aging labor force, is not conducive to improving labor productivity and hampers economic development.

From another perspective, the aging labor population structure, which is a consequence of the population aging, has a negative impact on industrial structure. This is primarily due to the decline in cognitive abilities among the elderly labor force, reduced capacity to embrace novelty, the lack of innovation, and the inability to adjust to technological advancements and shifts in industrial structure. These factors impede the enterprises' reformation and innovation. With the continuous development and progress of social technology, new industries and occupations persistently emerge, contributing to the gradual decline and extinction of traditional industries. The aging labor force has limited adaptability to job transitions and finds it difficult to adapt to shifts in industrial structure. Consequently, the aging age structure of the labor force not only hampers the improvement of labor productivity but is also not conducive to the upward movement of the entire industrial structure, which in turn affects economic growth.

If the retirement age remains unchanged while life expectancy increases, there will be relatively more people claiming pension benefits and a smaller workforce contributing to income taxes. At the same time, as the labor force decreases in size, there is increasing pressure on everyone within the labor force. This is because they have to pay higher taxes to generate more government tax revenue, which is needed to fund higher pension payments. As a result, the dependency ratio increases. In other words, the ratio of retirees who generate savings to working people who save for retirement will be higher, so the total savings rate will be lower. A lower savings rate slows economic growth (Futagami & Nakajima, 2001).

Meanwhile, given that the demand for healthcare increases as the population ages, countries with rapidly aging populations must allocate more money and resources to their healthcare systems. In China, the government spending on healthcare as a percentage of GDP has already been high. With an overall increase in government spending, a smaller proportion of government spending can be allocated to accelerate economic development. Although higher demand

[7] From China Statistical Yearbook 2022, https://www.stats.gov.cn/sj/ndsj/2022/indexeh.htm

[8] From website National Institute on Aging, https://www.nia.nih.gov

for healthcare creates job opportunities and boosts prosperity, its negative impact has dominated. Research has shown that the slowdown in labor productivity growth has not been fully offset by capital deepening or labor-enhancing technological change (Maestas *et al.*, 2023). Börsch-Supan (2003) also noted an example in the context of Germany that capital-deepening was not possibly enough to offset the negative effects of aging on economic growth. Moreover, even though economies may get benefit from the consumption of elderly-related goods and services, they may face challenges in the transition process.

C. Chinese Pension System

The trend of China's aging population is expected to persist in the long term, and the impact of population aging on the pension system will also be enduring. According to statistics, the total dependency ratio will continue to rise significantly in the next 30 years, with the burden of elderly care gradually becoming the primary social responsibility for the working-age population in China. That is, by 2049, the elderly dependency ratio will increase to 49.9, approximately 6 percentage points higher than the average level of 43.9 in OECD countries (Bai & Lei, 2019).

At present, China employs a pension system of unified pension account combinations, which amalgamates overall social planning and personal accounts. In the social pooling account, funds come solely from employers, constituting 20 percent of wages. These funds are used to pay the socially planned part of the pension for retired employees. The other portion is the basic pension insurance paid by individuals, accounting for 8% of personal accounts. This contribution enters the personal account to cover the pension payments after retirement, motivating employees to work diligently and save more for their future. This funding scheme is designed to balance the burden on employers through the implementation of a pay-as-you-go system, reflecting social mutual assistance. A pay-as-you-go pension plan refers to an insurance financial model where the contributions of a working generation during the same period are used to pay for the pension of a retired generation. The beneficiaries of the plan determine the amount they want to pay by regularly deducting a specified amount from their salary or paying the required amount in a lump sum. Finally, government expenditure is also an indispensable part of the pension system. The government bears a portion of the pension to ensure the basic living standards of the elderly.

According to the Statistical Communique of the People's Republic of China on National Economic and Social Development in 2022 released by the National Bureau of Statistics, 503.49 million people participated in the basic pension insurance for urban employees nationwide, at the end of 2022, representing an increase of 22.75 million compared to the previous year. There were 19.54 million individual pension participants, 6.13 million contributors, and a total contribution amount of 14.2 billion yuan.

China's basic pension operation is currently under significant financial stress. Firstly, there is an over-reliance on basic pension insurance. Of the approximately 6 trillion yuan pensions, the basic pension insurance fund accounts for about 5.09 trillion yuan, or 77%, while the enterprise annuity scale is about 1.48 trillion yuan, accounting for 22% (Xu, 2020). Local governments withdraw funds from these accounts to cover the pension deficit in the social pooling account, resulting in the problem of "empty accounts" (Li & Lin, 2016). Additionally, the construction of the personal account pension system lags. On another front, with a rapidly aging population and a low minimum payment period for receiving pensions, this combination has created overwhelming pressure on China's pension system. Over the next 30 years, as a large number of baby boomers approach or reach old age, the number of people claiming pensions will sharply increase. Meanwhile, the number of contributors will begin to decrease, expanding the potential long-term funding gap (Bai & Lei, 2019). Therefore, the pay-as-you-go system will also be affected as the proportion of the working population gradually decreases, creating a pension gap. The Chinese Academy of Social Sciences reported that in 2023, the funds for basic pension funds will not be able to cover pension expenses and the accumulated balance of pension funds will be depleted by 2029[9].

The contribution rate stipulated by the basic old-age insurance system is too high, while the actual contribution is low. The high contribution rate leads to an inaccurate contribution base, thereby posing a greater risk to the sustainability of pension income and expenditures. According to the statistical bulletin date of the Ministry of Human Resources and Social Security, the growth rate of China's basic pension collection revenue has been lower than the growth rate of expenditure in recent years. The growth rate of pension fund income has gradually decelerated, while the growth rate of fund expenditure has gradually accelerated. Thus, maintaining a steady rate of contributions would create significant pressure on the balance between pension income and expenditure. As shown in the statistical bulletin data on the development of human resources and social security, the growth rate of China's basic pension levy income has shown a trend lower than the growth rate of fund expenditure in recent years. The growth rate of fund income has gradually slowed down, while the growth rate of fund expenditure has gradually accelerated. Consequently, the basic pension system may face a significant payment gap in the future, posing challenges for pension insurance operations.

At the same time, China's individual pension system lags in terms of construction. Over the years, it has primarily relied on commercial insurance companies and financial institutions to sporadically introduce personal pension products, resulting in a small scale. People have not been aware that the individual pension system is a way to save for themselves. In developed countries, the average premium payment per capita is as high as $3,000 or more, while in China it is only $27 (Xu, 2020).

D. Research Methodologies

In recent years, with the rapid development of the aging process of the Chinese population, research on population aging has made valuable achievements in documenting the aging process. Most of the studies used quantitative analysis or case analysis research methods. Quantitative analysis is the use of mathematical and statistical techniques to analyze and interpret data. For example, Liu and Hu (2013)

[9] From Chinese Academy of Social Science 2014 http://casseng.cssn.cn/about/about_cass/

developed a quantitative model to discuss to what degree birth rates and population aging affect populations, age institutions, and national economic development. They assume that only the working-age population has bank savings and that the dependent population (the elderly and children) only consumes but does not save. They derived a formula that extrapolated a positive correlation between birth rates and economic growth. The quantitative analysis method helps the researchers to provide precise and objective results, and the relationship between birth rates and the aging population in large datasets can be easily identified by using mathematical models and statistical tools.

Case analysis involves the study of a particular situation or problem, the identification of key problems, and the development of potential solutions. Faruqee and Mühleisen (2003) have discussed the impact of population aging on economic development in the Japanese context. Their study estimated output losses due to demographic change and assessed the impact of aging on Japanese government finances. In addition, they compared the impact on economic growth and welfare of key fiscal policy choices made to address the economic impacts of aging. By studying Japanese real-world cases, researchers can gain a deeper understanding of the complexities of the impact brought by the aging population in Japan. Moreover, case studies can help scholars analyze the fiscal challenges that the Japanese government may face in aging situations and how the government might apply the theoretical knowledge to real-world scenarios.

III. Trends of Population Aging in the Future 30 Years and Corresponding Reactions

A. Prediction of Future Aging Issue

1) How the future aging issue will be

In general, persistent factors affecting the birth rate are expected to intensify the severity of population aging in the future. The main reason for the changes in the birth rate and the growth rate of the Chinese population is the one-child policy implemented by the Chinese government decades ago. Currently, China's population has an age structure resembling a shrinking pyramid, characterized by a shrinking base and an expanded to. This shape illustrates that China has an aging society marked by declining birth rates and a rising proportion of elderly individuals. In view of the above factors leading to population aging, we can predict that China's population aging will become more and more serious in the next 20 years. According to the National Bureau of Statistics, the birth rate in 2022 was 6.77%, a decrease of 0.75 thousandths from 2021's 7.52%, and down 1.00 thousandths from 2020. In the seventh national census conducted in 2021, 264,018,766 people aged 60 and over accounted for 18.70% of the population. In addition, 190,635,280 individuals were aged 65 or above, representing 13.50%. Compared with the sixth national population census in 2010, the proportion of people aged over 60 increased by 5.44 percentage points, and the proportion of people aged over 65 increased by 4.63 percentage points. These statistics indicate that the birth rate is likely to continue decreasing and the proportion of the aging population will persistently increase as well. However, we predict a slowdown in the degree of population aging in the 2050s. This is attributed to the one-child policy of 1978, implemented to control the rapid growth of the population. As a result, the total population born in the 1980s was significantly smaller than in previous decades. Consequently, when individuals born in the 1980s reach old age in the 2050s, the proportion of the elderly population in the total demographic is expected to decrease, thereby alleviating the extent of population aging.

2) How will the future aging issue affect economic growth?

In general, an aging population in the future will lead to a decline in productivity, bring challenges to economic transformation, increase the working hours of the labor force, and put great pressure on the pension system and healthcare system. These factors will have a negative impact on China's future economic development.

It is predicted that between 2030 and 2050, population aging will become an increasingly serious issue in China. The aging labor force will increase the proportion of the elderly labor force, leading to a decline in productivity and challenging the transformation of the economic structure. The labor force in China needs to adapt to relatively new knowledge and technological structures. Therefore, a higher proportion of the elderly labor force, which may be less adaptable and innovative, could hinder labor productivity. However, productivity is a key determinant of economic development, and a workforce with lower adaptability and innovation capacity can stagnate economic activity. On the other hand, factors such as the decline in the ability to accept new things the elderly labor force, and the inability to adapt to technological progress and changes in the industrial structure hinder the reform and innovation of enterprises because of their limited adaptability to job transitions, which further has a negative impact on economic growth. For China, the economic transition brought about by the progress of science and technology determines China's economic development. Although both negative effects are due to the weak adaptability and innovation capacity of the older workforce, the effects are from different economic perspectives.

At the same time, as the size of the workforce shrinks, the pressure on every labor force is increasing, which reflects the increase in the dependency ratio. For each workforce, they may need to work longer hours to pay the government's taxes, which are used for pension benefits. The increase in individual working hours will reduce employee efficiency and productivity, leading to a negative impact on China's economic development. Meanwhile, the increase in the dependency ratio may also add pressure on families to care for the elderly.

On the other hand, both the pension system and the health care system will be affected because of the aging population. With the increase in the dependency ratio, the pension burden has become a major social issue for China's working-age population, creating substantial financial pressure on the basic pension system. The decline in the proportion of the working population, due to aging, has created a certain gap in pension funding. In recent years, the growth rate of China's basic pension income has significantly lagged the growth rate of expenditure. If the pension fund becomes insufficient, it could lead to reduced living standards, negatively impacting the economy. Moreover, the elderly's demand for medical

services is increasing with the development of China's aging society, raising concerns about the sustainability of China's elderly welfare system (Wang & Chen, 2014).

In the 2050s, as population aging is expected to slow down over the decade, the impact of population aging will also change. Such predictions are based on the alleviated pension funds pressure and the higher adaptability of people born in the 1980s. As mentioned earlier, due to the one-child policy, the 1980s generation is smaller in number than the 1960s and 1970s generations. An expected fall in the elderly population will lead to a drop in the dependency ratio, and thus the pressure on the pension system will be alleviated. Furthermore, since 1978, the Chinese government has formulated a series of higher education policies. In 1999, to solve the economic and unemployment issues, the Chinese government implemented an educational reform policy to expand the number of students enrolled in ordinary colleges and universities. As a result, people born in the 80s benefited from the expanded university enrollment policy. Therefore, they can work in more technical jobs and adapt to innovations and advances in technology when they are 60 years old.

3) What should we do to face the aging period?

In response to the future challenges of population aging and its negative impact on economic development, the following solutions are proposed:

Firstly, in the next 20 years, the government needs to adjust the birth policy and implement the policy to allow couples to have three children, accompanied by supportive measures. By effectively implementing the three-child policy, the birth rate will increase, and the decline in the total fertility rate will be smoothed. Therefore, the age structure of the population will be improved, so that the proportion of the elderly population will decrease, and consequently reduce the degree of population aging. More importantly, the birth policy needs to reduce the cost of raising children and enhance confidence in childbirth. Specifically, this could involve the establishment of non-profit hospitals for women and children to reduce childbirth costs. Besides, reducing the cost of education and adjusting the allocation of educational resources will also be helpful in cultivating the next generation's innovation ability. To sum up, systematical policies need to be implemented to support families and enhance their willingness to have children.

Secondly, the government may need to adjust the industrial structure. China's economic structure is dominated by labor-intensive industries, where physical strength is crucial for productivity. Labor-intensive industries mainly rely on large numbers of young workers in the process of production and have a low degree of dependence on technology and equipment. Therefore, the government needs to cooperate with the rapid development of China's economy and industrialization process, improve technological capabilities and innovation capabilities, reduce the proportion of labor in the production process, and let China's capital-intensive industries and medium-high technology industries continue to develop. As a result, the impact of the aging of the working population on the industrial structure will be reduced.

For China's pension system, the government needs to appropriately adjust the structure of the pension system. In the three-pillar pension system, the second pillar occupational pension is an important source of income for the insured after retirement, and it is an important guarantee for improving the quality of life of the elderly. Thus, the government should expand the coverage of the second pillar occupational pension and increase the participation rate of the second pillar occupational pension. Secondly, the government needs to speed up the construction of the personal pension system, taking necessary incentives, such as increasing fiscal and tax incentives to increase the participation rate of personal pensions, encourage financial institutions to vigorously develop personal pension products, and publicize the importance of personal pensions to the masses. Meanwhile, as the issue of population aging may not be so serious in the future, the government should recover part of the investment in advance to build a better-functioning pension system after 2050.

B. Counterarguments and Respond

Although the aging of the population has a great negative impact on economic development, it is undeniable that to some extent, the aging of the population may also bring some help to economic growth. Empirical results from some scholars show that the birth rate is declining, and the percentage of working years is decreasing. These two demographic changes contributed to the increase in the proportion of the population aged 19.7%, which led to the aging of the population, and the average annual growth rate of China's per capita GDP increased by 1.21 and 0.73 percent, respectively (Liu & Hu, 2013). This may be because population aging may spur more investment in human capital, with a positive impact on economic growth (Futagami & Nakajima, 2001). The reason why more investment in human capital can be stimulated is that the decrease in labor supply due to the aging population will increase the level of wages and reduce the return on investment in physical capital, but the return on investment in human capital will increase, which is conducive to promoting investment in human capital. From the perspective of labor productivity, since the aging of the population may lead to an aging of the working age structure, the older labor force that remains in the industry can often bring a wealth of experience and skills, and their proficiency level also maintains a high level of productivity. They may have more resources and time to devote research to innovation and development activities. At the same time, they can pass on their experience to younger workers, which will increase labor productivity and thus economic growth. As the population ages, labor costs will continue to rise, and companies seeking to maximize profits may use capital and technology to replace labor with increased investment in technological innovation, which will promote technological progress.

However, we cannot predict the decisions of firms and determine whether the older workforce has experience and skills, so we cannot accurately judge whether an aging population will improve labor productivity. To put it in a nutshell, although the aging of the population has a positive impact on economic development, the overwhelming negative impression is dominant.

On the other hand, the implementation of the two-child or even three-child policy may not be effective in increasing the fertility rate. First, if a woman has three children, it will take

them at least six years to prepare for pregnancy and childbirth. This means that during these six years, they may not be able to devote themselves to their work. As women have more sense and independence of mind, most women are unwilling to sacrifice their employment rights even if their families give them a lot of support. According to China's National Bureau of Statistics, the average number of ideal children in a woman's mind is only 1.8. In addition, the financial pressure of having three children is very high as raising a child often comes with a range of high costs to pay. The fertility rate is closely related to the level of family income, and if the family is not well-off, raising children can be a heavy burden for a family (Li, 2023). Therefore, the two-child or even three-child policy not only puts pressure on women's health but also puts great pressure on men's work and careers. If the Chinese government is unable to provide supporting financial help and psychological encouragement to have children, the two-child and three-child policies will be very difficult to implement. Therefore, I suggest the government implement more policies to alleviate the burden of raising children, which will be crucial for the effectiveness of the birth policy.

IV. Conclusion

The paper predicts that the Chinese aging issue will continue to be a serious issue in the next two decades. Nevertheless, in the 2050s, the severity of population aging will be eased. Summarizing previous research, this study predicts that aging issue will lead to a negative impact on the Chinese economy. Finally, this paper proposes several possible ways for the Chinese government to reduce the aging issue and its impact on the Chinese economy.

Due to the decreasing birth rate and fertility rate and increasing life expectancy, the aging issue in China will sustain bring negative effect on Chinese economic growth in the next 20 years, while the severity of population aging will slow down in the 2050s due to the one-child policy carried out in the 1980s. The future aging structure will influence the growth of the Chinese economy by affecting productivity, bringing difficulties in industrial transformation, and putting pressure on the healthcare system and pension system. In the 2050s, a fall in the elderly population will lead to a drop in the dependency ratio, and thus the pressure on the pension system will be alleviated because of the university's policy of enrollment expansion in 1999. To reduce the impact of the aging issue on the Chinese economy, the Chinese government should implement the two-child or even three-child policy, adjust the industrial structure, the structure of the pension system, and appropriately reduce investment in order to guarantee the construction of the pension system in the 2050s.

Conflict of Interest

The author has claimed that no conflict of interest exists.

References

Ahmed, S., Cruz, M., Quillin, B., & Schellekens, P. 2016. Demographic change and development: A global typology. ***World Bank Policy Research Working Paper,*** 7893.

Bai, C., & Lei, X. 2019. New trends in population aging and challenges for China's sustainable development. ***China Economic Journal,*** 13(1): 3–23.

Bloom, D. E., & Luca, D. L. 2016. The global demography of aging: facts, explanations, future. In North-Holland. (Ed.), ***Handbook of the economics of population aging,*** 1: 3–56.

Borsch-Supan, A. 2003. Labor Market Effects of Population Aging. ***Labour,*** 17(SpecialIssue): 5–44.

Craig, J. 1994. Replacement level fertility and future population growth. ***Population trends,*** (78): 20–22.

Crossman, Ashley. 2020. Age Structure and Age Pyramids. Available: https://www.thoughtco.com/age-structure-definition-3026043

Cutler, D. M., Poterba, J. M., Sheiner, L. M., Summers, L. H., & Akerlof, G. A. 1990. An Aging Society: Opportunity or Challenge? ***Brookings Papers on Economic Activity,*** 1990(1): 1.

Faruqee, H., & Mühleisen, M. 2003. Population aging in Japan: demographic shock and fiscal sustainability. ***Japan and the world economy,*** 15(2): 185–210.

Futagami, K., & Nakajima, T. 2001. Population aging and economic growth. ***Journal of Macroeconomics,*** 23(1): 31–31.

Li, H., & Zhang, X. 2015. Population aging and economic growth: The Chinese experience of Solow model. ***International Journal of Economics and Finance,*** 7(3): 199–206.

Li, S., & Lin, S. 2016. Population aging and China's social security reforms. ***Journal of Policy Modeling,*** 38(1): 65–95.

Li, Y. 2023. Analysis of the advantages and disadvantages of the threechild policy and its impact forecast. ***Advances in Economics, Management and Political Sciences,*** 7(1): 6–11.

Liu, S., & Hu, A. 2013. Demographic change and economic growth: Theory and evidence from China. ***Economic Modelling,*** 35: 71–77.

MacKellar, L., Ermolieva, T., Horlacher, D., & Mayhew, L. 2004. The economic impacts of population ageing in Japan. ***In The Economic Impacts of Population Ageing in Japan,*** Edward Elgar Publishing.

Maestas, N., Mullen, K. J., & Powell, D. 2023. The effect of population aging on economic growth, the labor force, and productivity. ***American Economic Journal: Macroeconomics,*** 15(2): 306–332.

Ritchie, H., & Roser, M. 2019. Age structure. ***Our World in Data.*** Available: 'https://ourworldindata.org/age-structure'

Urbanek, A., Acedański, J., & Krawczyk, G. 2023. Depopulation or ageing? Decomposing the aggregate effects of projected demographic changes on urban transport systems. ***Journal of Transport Geography,*** 111: 103662.

Wang, X. Q., & Chen, P. J. 2014. Population ageing challenges health care in China. ***The lancet,*** 383(9920): 870.

Wang, Y., & Zhou, C. 2020. Promoting social engagement of the elderly to cope with aging of the Chinese population. ***Bioscience trends,*** 14(4): 310–313.

Xu, X. 2020. The current state, challenges, and policy recommendations of China's pension system. ***Central University of Finance and Economics***. Available: http://iigf.cufe.edu.cn/info/1012/3431.htm