

# ***An Analysis of the Impact of Population Ageing on Inflation in China***

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**Abstract:** The relationship between demographic change and economic development is one of the most recent and important research topics. Researchers have found that aging will have a certain impact on inflation, but there is still a research gap and controversy on China's inflation problem. Therefore, this paper collects data on the aging process of China's population and inflation rate between 2004 and 2023 and applies graphical analysis and literature analysis to study the data to try to find a cleaner relationship. Through the research, it can be concluded that China's changing population structure has a relatively inhibitory effect on inflation and a negative effect on economic development. The reason may be that the decline in the labor force caused by population aging has a greater impact on aggregate demand than on aggregate supply. Overall, to reduce the impact of the deepening process of population aging, postponing the retirement age and developing the elderly care industry can be an effective way to boost aggregate supply growth to control the increased inflation rate.

**Keywords:** Inflation, population structure, aging

## **1. Introduction**

As the world's population reaches 8 billion on 15 November 2022, the number of older people grows. In the World Social Report 2023, published by the United Nations, it is noted that the number and proportion of older persons in the global population have been rising for decades, while the number and proportion of children and youth have begun to decline [1]. The number of people aged 65 or over is projected to double to more than 1.6 billion by 2050. At the same time, the report concludes that, on a regional basis, the number of older persons in developing countries will increase the most and the most rapidly, with Asia becoming the region with the largest number of older persons [1]. The rapidly aging population will undoubtedly have a dramatic impact on economic and social development. The immediate reason for this is that an increase in the aging population directly affects and reduces the labor force, thereby reducing aggregate supply. At the same time, the consumption habits of older persons have an impact on aggregate demand. Besides, in recent years, inflation in China has remained at a relatively high level due to the high appreciation trend in the property sector and price increases resulting from high economic growth, which is a significant index of macroeconomics because it can easily change the interest rate, unemployment and so on to affect individual's life and the society economic growth.

Therefore, finding the relationship between these factors is meaningful and essential. Other scholars' studies on age structure and inflation rates have concluded that changes in age structure

impact inflation. However, China is a developing country with a large land area and population base, so the situation may differ. Is the impact and relationship of these factors the same in China? Finding the answer is important for research into China's future development.

## 2. The Trend of Population Aging in China

Since China's reform and opening up, China achieved rapid economic growth. The dramatic increase in real GDP and real GDP per capital made China the world's second-largest economy. However, despite sustained population growth, the percentage of the working population and the aging of the population are becoming more significant.

According to the United Nations' definition of population aging, a country or area is said to be an aging society if the proportion of persons aged 60 years or over in the total population exceeds 10 percent, or if the proportion of persons aged 65 years or over in the total population exceeds 7 percent.

As can be seen in Figure 1, the population aged 65 and over shows a continuously increasing trend, in 2004 the population of elderly people was 98750 thousand, and in the following 20 years the figures continued to rise and the number has shot up to 216760 thousand in 2023 [2].

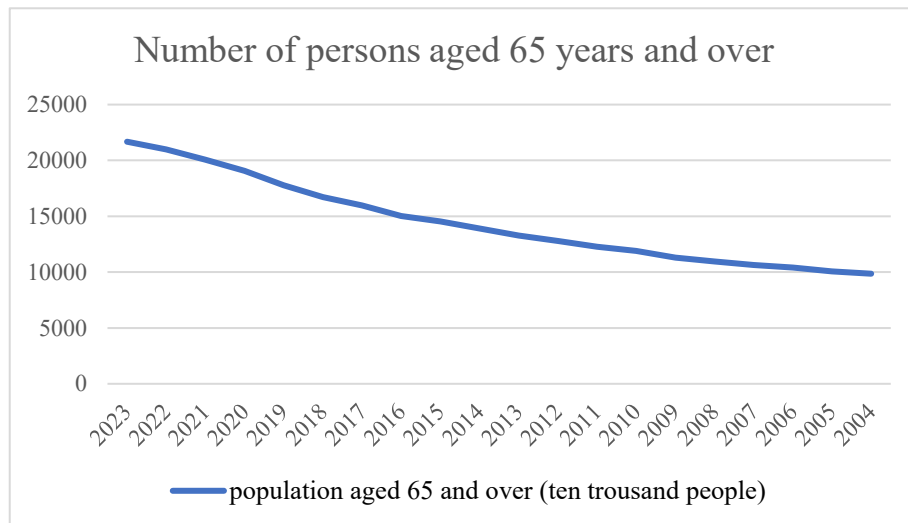


Figure 1: Number of persons aged 65 years and over

Figure 2 shows the population aged 65 and over as a proportion of the total population in China in 2010 and 2020, based on the Key Figures on the 2020 Population Census of China report issued by the National Bureau of Statistics of China. From 2010 to 2020, the proportion of the population aged 60 and over increased by 5.44 percentage points to 18.70%, and the proportion of the population aged 65 and over increased by 4.63 percentage points to 13.50%. Compared with the period 2000-2010, these increases are 2.51 and 2.72 percentage points respectively. Moreover, the number of older people is enormous. There are 260 million people aged 60 and over in China, of whom 190 million are aged 65 and over [3].

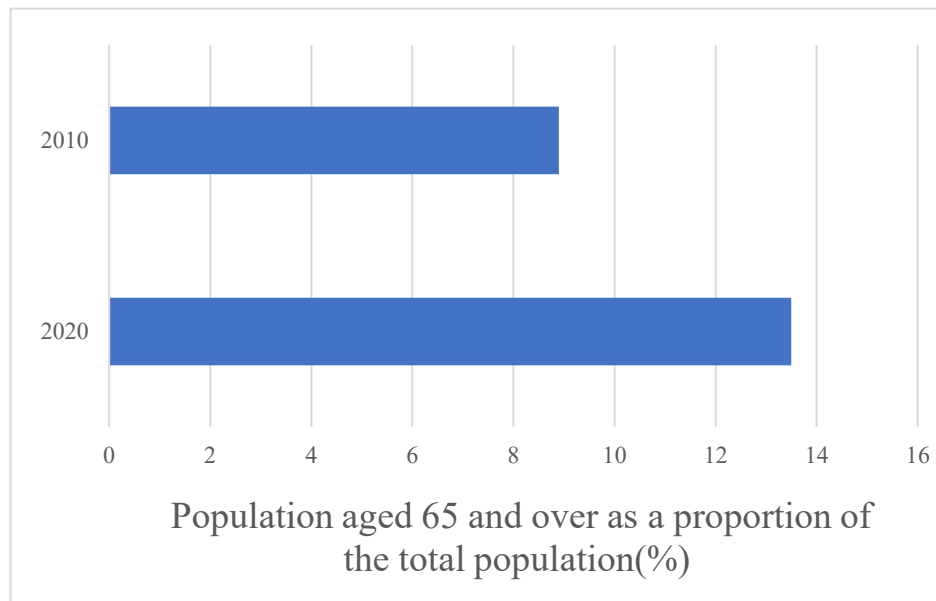


Figure 2: Population aged 65 and over as a proportion of the total population (%)

Moreover, the elderly dependency rate, which means the proportion of the elderly component of the non-working-age population to the working-age population that is used to indicate the number of older persons per 100 persons of working age, can reflect the social consequences of population aging from an economic perspective also shows an upward trend. As shown in figure 3, in 2004, the elderly dependency rate was about 10.7 percent, which has been on a monotonically increasing trend until 2022, when it jumps to 21.8 percent, which is about twice as high as the 2004 [2].

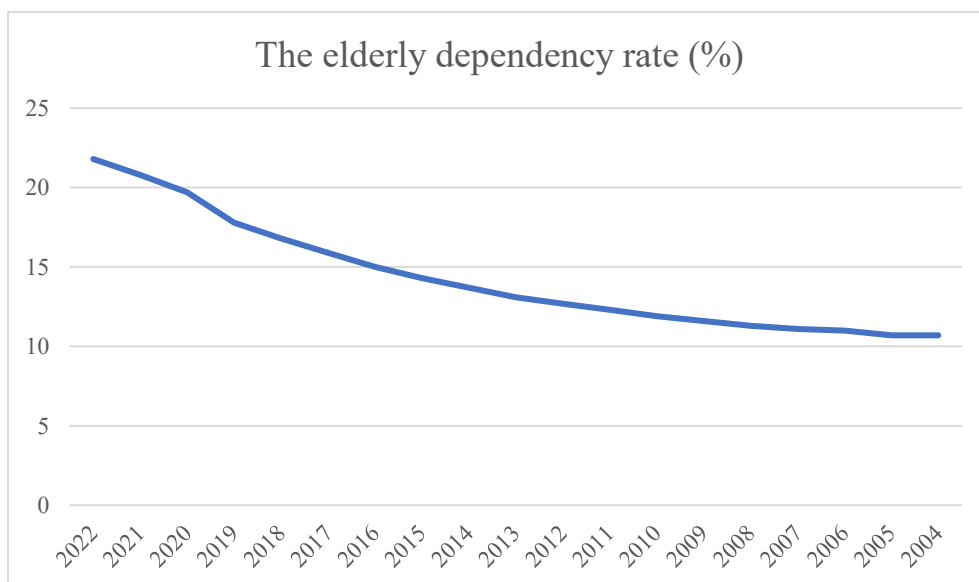


Figure 3: The elderly dependency rate (%)

Therefore, China has entered an aging society, and this demographic trend of a high proportion of elderly people will not be alleviated any time soon. This shows that population aging is an inevitable trend in China's social development and a basic national condition for a long time.

In this way, almost all aspects of society will be affected by the large number of older people, including the labor force and financial markets, the demand for goods and services such as housing,

transportation, and social security, and these factors can have a significant impact on China's economic growth. In addition, the growing aging population brings not only challenges but also opportunities for the economy. Higher demand for pension products and medical care will expand consumption and investment in those sectors. At the same time, the need to change aggregate demand will improve technology development and productivity. If viewed from the perspective of aggregate supply, the rise in population aging implies a decline in the supply capacity of labor factors, leading to a fall in potential output. With constant aggregate demand, wages will naturally rise, leading to cost-push inflation. However, if analyzed from the point of view of aggregate demand, an increase in the elderly population can also lead to a decline in the reserve ratio, higher interest rates, and a disincentive to investment, which in turn can lead to a decline in output and deflation [4]. So, based on the Chinese amount, will the inflation rate rise, fall or stay the same?

### 3. The Upward Trend of the Inflation Rate

The inflation rate is defined as a sustained and generalized increase in prices over a period caused by the supply of money being greater than the actual demand for money, in other words, the real purchasing power is greater than the supply of output, resulting in a depreciation of the currency under conditions of circulation of paper money. The inflation rate has a significant impact on the economy. Although a reasonable and appropriate rate of inflation has some positive effects on reducing the unemployment rate, improving the aggregate supply, and increasing economic growth, but excessive inflation rate can also result in the increasing cost of production and investment will decrease the aggregate quantity of supply. Moreover, the increase in the price level and the decrease in the real wage rate increase the chance of individual poverty.

In this essay, the researcher uses the difference between the growth rate of M2 (Broad Money Supply) supply and the growth rate of GDP to measure and calculate the inflation rate. As can be seen in Figure 4, the supply of M2 keeps increasing from 2004 to 2023, in the beginning of the graph in 2004, shows 2532077 million RMB, and then reaches 292300000 million RMB in 2023 [5]. Comparing the growth rate of M2 with the increasing rate of GDP growth in Figure 5, the number of M2 supply was all higher than the amounts of growth rate of GDP, which means every year from 2004 to 2023 all have relatively higher M2 increase rate and lower GDP growth rate [6]. Therefore, every year between 2004 and 2023 has a positive inflation rate.

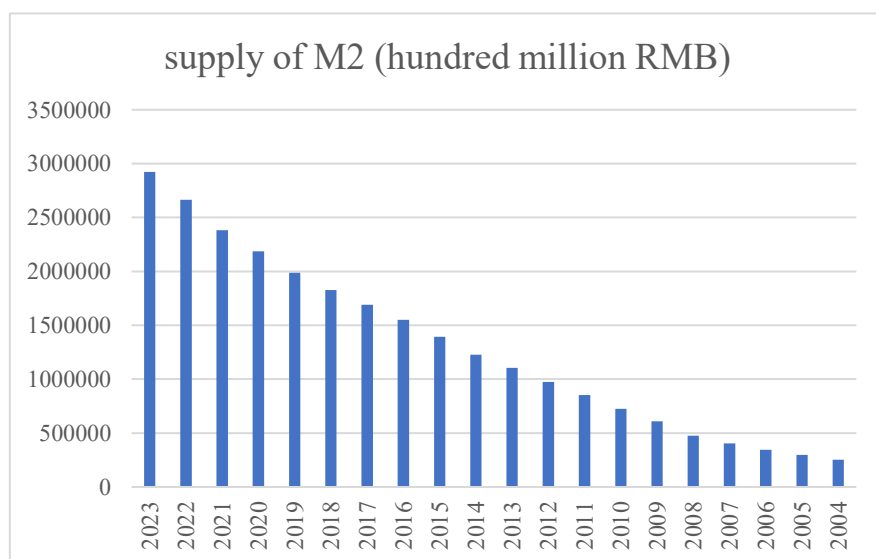


Figure 4: The supply of M2

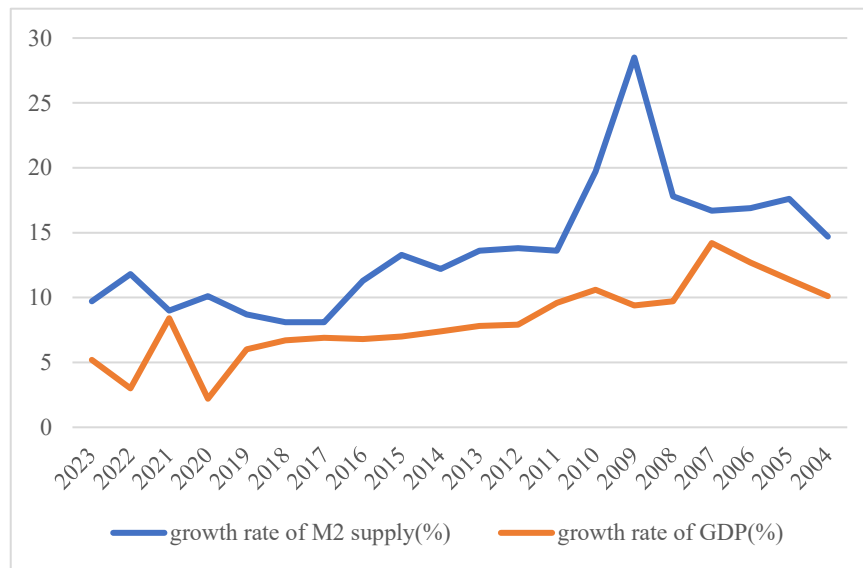


Figure 5: The growth rate of the supply of M2 and GDP (%)

Looking at the whole picture, the inflation rate from 2004 to 2023 in China approximates 5.61%. Belongs to relatively high inflation. In this growth rate, the government should consider an effective way to reduce the inflation rate avoid the negative impact of economic growth.

#### 4. The Relationship Between Population Aging and Inflation Rate

By studying data from other countries, including Japan, Korea, and Italy, a declining labor force and an aging population necessarily lead to a general increase in the level of inflation, in other words, there is a non-linear relationship between population aging and inflation rates [4,7]. Besides, depending on national situations, geographic location, etc., the relationship between the two can be variable, resulting in either positive or negative impacts. For example, Guosheng Wang's study shows that, unlike developed countries, in developing countries such as China, the demand-side mechanism may cause the overall price level to rise less, so the inflation rate may rise less [8]. These two figures also show a different relationship between different provinces and areas in China [9]. Moreover, the relatively negative correlation between population aging and the inflation rate can be found in many aspects [9-11].

As shown in Figure 6, China's inflation rate has been relatively moderate in recent years compared to the early twentieth century. Between 2009 and 2013, the inflation rate peaked at 8.78 but has since decreased to a range of 3.64 to 4.9, which is much lower than the peak. However, the proportion of elderly people in the population has been consistently increasing. The number of elderly citizens is increasing, leading to a significant rise in the aging population over the past ten years. Meanwhile, those trends, the increasing aging proportion and decreasing or slightly waved inflation rate is expected to continue in the future.

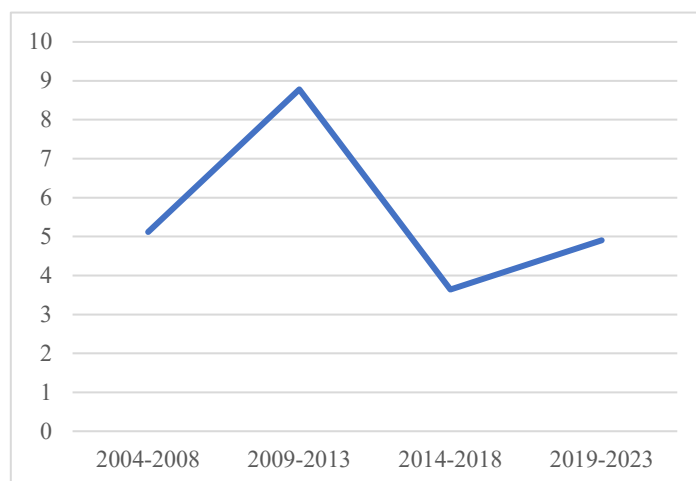


Figure 6: Five-year base inflation rate

Therefore, by comparing the data of China, the study can conclude the relationship between inflation and the ageing of the population structure. The data shows that the increasing aging population does not significantly contribute to the inflation rate, and it may hurt inflation to some extent.

## 5. Conclusion

In this study, it was found that when the number and percentage of the elderly population increased, inflation did not increase, but there were fluctuations and decreases, so it can be concluded that there is not a positive proportion between these two factors and that population aging has a relative dampening effect on the rate of inflation. The reason for this effect may be that the current increase in the elderly population in China has not completely driven the change in aggregate demand, but the reduced labor force has a direct impact on China's demographic advantage as a populous country, which reduces aggregate supply and therefore slows the growth of inflation. Therefore, the government should postpone the retirement age, which can reduce the decline of the labor force to slow down the leftward shift of the aggregate supply curve. And also, to develop the elderly care industry to increase the aggregate demand.

This study scientifically assesses the objective impact of population aging on inflation using data. This helps to clarify the relationship between the two factors. In future studies, more detailed control of the relevant variables is needed to facilitate in-depth research on the topic.

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