

The Effect of Population Ageing to the Yangtze River Delta

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Abstract: The steady growth of the economy is the basis for the successful realization of this integration of the Yangtze River Delta. The labor supply problem caused by the aging population is becoming a potential factor threatening the economic growth in the Yangtze River Delta region. By describing the relation among population aging, labor supply and economic development, according to the panel data of 31 provinces, municipalities and autonomous regions in China, this paper uses the panel autoregressive model to empirically analyze the interaction between population aging, consumption and labor force on the economy through co-integration test, impulse response graph and variance decomposition in China and in the Yangtze River Delta. The results show that the negative impact of population ageing on economic growth and labor supply of Yangtze River Delta is greater than that of the whole country, which may be due to the choice of migrant workers to "retire to their hometowns". Because of the rapid inflow of migrants and the increase of human capital, the impact of the Yangtze River Delta's labor supply on economic growth is not significant. This suggests that efforts by increasing the supply of workers on Yangtze River Delta to mitigate the negative effects of aging on economic growth should not be focused solely on increasing the nominal supply of workers. At the same time, we should improve the quality of labor force and the demand of the pension market to increase the real supply of labour force and promote economic growth.

1. Introduction

The population ageing will reduce the working age population and increase the share of old population, which in turn will pose challenges to the Labor supply, consumption, investment, and the improvement of the old age medical security system. Foreign advanced economies, such as America, Britain, Japan, and South Korea, have long since entered society. But high levels of per capita income, cutting edge technological innovation and well developed social welfare systems in developed countries can sustain productivity driven economic growth and thus population ageing problems. China's demographic trend of "getting old before getting rich" has made the population ageing problem worse. According to statistics, China's population, aged 65 and older, accounted for 6.96 percent of all population in 2000, and became the country with the largest elderly population in the world in 2014, accounting for 11.39 percent of the population by the end of 2017 Well above the international standard of 7%. Population Ageing can cause a decline in the working age population and a rise in the proportion of the elderly, putting pressure on labor supply, consumption, investment, and improving the health care system for the elderly, which in turn affects the level of economic growth. As the most developed zone in China, achieving regional integration and high quality development has become a national strategy in the Yangtze River Delta. To achieve this strategic goal successfully, maintaining stable economic growth is an important prerequisite. Now, there is serious population ageing and the potential threat in the Yangtze River Delta. Under the conditions of the population ageing, how to make use of the market mechanism, industrial innovation, system construction and other major means to maintain sustainable economic increase and lower the negative influence of ageing population in the largest extent has become a hot topic in

the academic community.

At present, there is little research on the related fields of the Yangtze River Delta. This paper analyzes the mechanism of ageing population to Labor supply on the premise of population ageing and economic growth slowdown, and selects the Yangtze River Zone as an example using the PVAR model to empirically examine the results of the population ageing's impact on labor supply and economic growth, and finally comparing the Yangtze River Delta with domestic situation, to provide policy recommendations on how to reduce the negative impact of aging on the economic growth of the Yangtze River Delta and form a pattern of coordinated development between economic growth and ageing population.

2. Literature Review

2.1 Research on population ageing and Labor Supply

Researchers at home and abroad have focused on the relationship of ageing population and labor supply from two perspectives. One is that population ageing affects the size of the labour force, the rate of labour participation and the rate of labour productivity.(Cai Fang 2009; Wang Lijun 2012; long Xiaojun 2017; Jack A. Goldstone 2016; Banister j, et Al. 2012)[1-5].The second point is that the population ageing effects on the composition of the working age population, focusing on the population ageing effects on the ageing of the working age population and hence on economic growth. (Bloom de 2010; Qi Chuanjun 2010; Chen Yuxue 2015; Dong Yufen 2014)[6-9].

2.2 Research on the relationship of ageing population and economic growth

Most scholars at home and abroad have studied the effect of the supply of aging labor force on economic growth from the perspective of the change of working age population structure. One perspective is in the view of the share of the working age and the aging of its structure. (Cai Fang, Wang Meiyan, 2006; Han Yongbao, 2015)[10-11].Another perspective is the population ageing to affect the supply of labor and ultimately the level of economic growth, through age-specific Labor Productivity (Cai j, Stoyanov A 2016)[12] and labor participation (Petra Mare ov et al.2015)[13]. As so far, there is no consensus on this question whether it ultimately has a positive or negative effect on the economy.

3. Metrological Model Setting and Variable Description

This paper analyzes the effects of ageing population on labor force and economic growth by constructing panel Vector autoregression. The Panel Data Vector Auto-regression (1988) was proposed by Holtz-eakin to analyse the interactions between variables without proper theoretical support, treating the research variables in the research system as endogenous variables. The impact of one endogenous variable on other endogenous variables is analyzed by calculating the orthogonal impulse response function, and the individual effect and time effect are also considered by using Panel Data Covering Individual differences and the common impact of different cross-sections.

The PVAR model in this paper is:

$$Y_{i,t} = a_i + \beta_t + \sum_{j=1}^p \beta_p Y_{i,t-p} + \varepsilon_{i,t} \quad (1)$$

In which the provinces are represented by $i=1, 2, \dots, 31$; the years are represented by $t=2002, 2003, \dots, 2017$; when we consider population ageing-labor force-economic growth, $Y_{i,t}$ is a vector containing three variables $Y_{i,t} = \{gdprate, porate, elrate\}$, p is the lag order; and a_i represents the individual effect, that is, allowing for regional differences in the variables. β_t represents the time effect, depicts the time trend of the variable, β_p is a 3-d coefficient matrix, and $\varepsilon_{i,t}$ is a random perturbation term.

4. Analysis of Empirical Results

To examine the dynamic connection between ageing population and some economic variables, the impulse response function is used to show the effects of endogenous shocks on themselves and other endogenous variables.

At the national level, the empirical results show that in the face of the positive impact of the population ageing, economic growth is negative, but the negative effect has weakened. This suggests that the population ageing has reduced economic growth by reducing the number of workers. Population ageing shocks have a negative effect on the share of the workforce, reducing the number of workers, or population ageing. An orthogonal negative impact of the proportion of the labor force has a bad impact on economic increase, since the proportion of the labor force increases in the short term to hinder economic growth. In the short-term, the negative impact continues to increase, but in the long-term, the negative impact has slowed down, there is a negative positive trend. The results of the Yangtze River Delta pulse response were slightly different across the country.

The Impulse Response Diagram and the variance decomposition table are derived from an empirical analysis of the Yangtze River Delta using the same experimental procedure. Compared with the empirical results of 31 provinces in China, it can be concluded that:

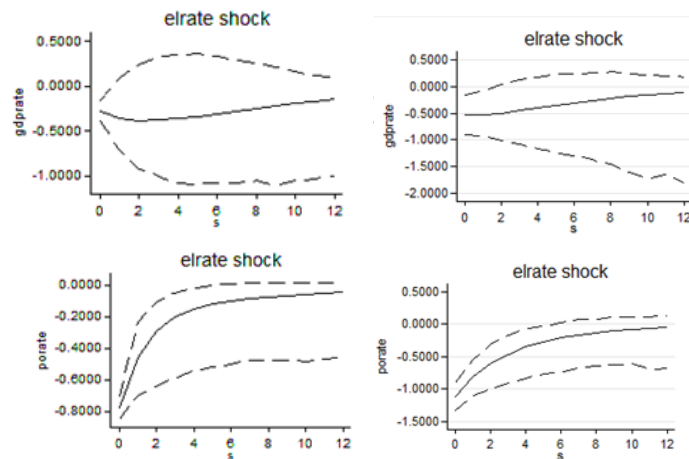


Fig. 1 The impact of national (left) and Yangtze River Delta (right) aging on economy and labor supply

Both the Yangtze River and the national population ageing have a negative impact on economic growth and labor supply, but the Yangtze River ageing population has a greater negative impact on economic growth and labor supply.

As can be seen from the Charts, the negative impact of the national population ageing shocking on economic growth increases first and then decreases, while the Yangtze River Zone population ageing continues to be negative for its economic growth. But the trend is slowing down comparing the trajectories of both graphs, it can be seen that the negative degree of the Yangtze River Delta in the first stage is roughly the same as that of the whole country in the second stage, and the rate of negative influence slowing down is decreasing. This suggests that the economic impact of the Yangtze River Delta ageing population is even more severe. In addition, both the national and Yangtze River Delta population ageing have had a gradual negative impact on the Labor supply. However, the negative impact of the 10th phase of the Yangtze River Delta is higher than the overall level, and the slowing trend is smaller than that of the whole country, which indicates that the impact of the aging of the Yangtze River Delta on the labor supply is more serious. This reflects the fact that the Yangtze River Delta is increasing at a faster speed than the nation population, that the working age population is decreasing at a faster rate than the national population, and that the final Yangtze River Delta of the Labor supply will be decreasing at a faster speed than the national level.

The negative impact of a deepening the Yangtze River Delta on economic growth and the

relative size of the labour force is greater than at the national level. The main reason may be the Yangtze River Delta is the most economically developed areas of China, migrant workers account for a large proportion, including a lot of high-quality labor force. As the region's labor force population increases, the young and able-bodied migrants contribute to the region's labor supply and economic growth. As the Labor Force Age increases, many migrant workers choose to "retire to their hometowns." The increase in ageing means that the process is becoming more intensive and that the number and quality of the labour force are being lost at a faster rate, with the negative impact of ageing on the labour supply of the Yangtze River Delta being greater than at the national level.

5. Conclusions and Policy Recommendations

This article examines the economic impact of the population ageing within the context of an endogenous demographic structure, using 2001 to 2017 provincial panel data on the old age dependency ratio, the GDP growth rate, and labor force ratio of 31 provinces and cities in China. The paper puts attention on the impact of Yangtze River Delta on economic growth with the proportion of the population ageing. The results show that by cutting labor supply, the population ageing directly reduces the input of factors of production of labor, reduces the total amount of social production, and hinders economic development; on the other hand, the labor force is aging, which reduced the rate of labor participation and labor productivity, thereby affecting economic development. It should be noted that the Yangtze River Delta has a relatively pretty level of human capital due to the large number of migrant workers and the pretty level of human capital in the labor force population ageing.

In the future, the bad effect of ageing population in China on economic growth will be more obvious. A proper management of the population ageing and the economy is essential to sustain our economic growth and promote the structural transformation and upgrade our economy. Policy choices can be made in the following areas:

5.1 To formulate and implement a rational population policy to ensure a certain rate of population growth and labor supply.

The population ageing has reduced the relative weight of the working age population, which affects the supply of power for sustained economic growth. Adopting an active population policy can expand the overall size of the labor force and reduce the burden on the elderly population. To this end, it is necessary to increase the level of fertility or the number of working years, thereby increasing the number of people in the labour force on the market. China introduced a comprehensive two child policy in 2015, but the effect is not obvious, up to birth rate only 10.94%. In order to give full play to the role of the two-child policy, it is necessary to provide appropriate supporting conditions to protect the rights and interests of childbearing women from the employment system, salary treatment and other aspects. Although the policy of delaying retirement is being implemented nationwide at present, there are still problems such as the relatively backward human capital of the aged labor force, the difficulty of adapting to the market demand and the low competitiveness of the market, etc. However, as the most economically developed and active Yangtze River Delta, the relatively high average level of human capital in the labor force and the large number of job opportunities provide the conditions for the implementation of the new retirement policy.

5.2 To raise the level of education, introduce foreign high-quality labor force, and constantly improve the level of human capital.

The relative quantity of labor force is not the point to economy, and the quality of labor force. The level of human capital is the main factor affecting economic growth. Education is the basic way to promote the level of human capital, through the improvement of education level can effectively enhance the level of human capital of workers, thus improving the quality of labor force. The Yangtze River Delta is rich in educational resources, and universities and scientific research

institutes that have an obvious agglomeration effect. Through the development of regional integration, the educational resources in the region can be more effectively integrated, and by increasing the sustained investment in education, to gradually increase the size of the educated population, through upgrading the educational levels and optimizing the educational structure, and at the same time to strengthen the construction of high-level universities, to continuously develop basic education and vocational education, continuously enhance the overall human capital level of the Yangtze River Delta region. At the same time, we should formulate and implement reasonable policies and management measures for the floating population, promote the demand for different levels of the population in an orderly manner, make use of the characteristics of the high mobility of the labor force, coordinate with the distribution of industries, and optimize the location structure of the labor force to increase the introduction of high-quality and imported personnel to enhance the level of human capital of foreign labor.

5.3 To give full play to the advantages of Yangtze River Delta economic growth, improve the social security system and increase the labor participation rate.

With the deepening of the population ageing, the demand of the old people for the social old-age service, the old-age medical service, the old-age health care service and the old-age products is increasing day by day. Expanding the size of an industry, upgrading its capabilities, and sustaining economic growth will further increase the demand for labor. For the growing problems of the Yangtze River Delta and the population ageing, some measures should be taken to adapt to the situation, such as, giving full play to the advantages of the higher level of economic growth in the region, and establishing and improving the social security system. In particular, we should strengthen the construction of old-age insurance and medical insurance systems. Under these measures, the old-age life of the elderly population can be fully guaranteed. The burden of supporting the younger generation can be reduced. The enthusiasm and possibility of labour can be increased, and the rate and efficiency of labour participation can be increased. At the same time, it can also promote the actual effect of old age consumption or increase the savings of the old population, thus driving the domestic demand of the economy or increasing the formation of capital, so as to promote economic growth.

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