The Impact of Aging Population on the Economy

Liang Bian, Kelin Zeng*

University of International Business and Economics, Beijing 100029, China.

Abstract: This paper will discuss the relationship between aging population and economic growth, and how other factors influence the relationship to provide a qualitative analysis for the new economic crisis. The two variables need to be controlled in this paper are health expenditure and income situation.

Keywords: Aging Population; Economy; Employment Pressure

Introduction

One of the great achievements of the twentieth century was the sharp rise in life expectancy. Over the past 50 years, the life expectancy in most Western economies has been rising, and the increase in life expectancy combined with the decline in birth rates has led many to worry about the impact of population aging.[1] The international view is that when a country or region has an elderly population over 60 years old accounting for over 10% of the total population, or an elderly population over 65 years old accounting for over 7% of the total population, it means that the population of this country or region is aging. It can also be referred to as population aging. The aging of the population will bring about a series of social and economic development problems, first of all, the impact on consumption.[2] High savings in pensions may reduce capital investment. If society uses higher incomes for pension funds, it can reduce the savings of more productive investments and thus reduce economic growth. Therefore, increasing aging population may have a negative influence on economic growth. This paper will discuss the relationship between aging population and economic growth, and how other factors influence the relationship to provide a qualitative analysis for the new economic crisis.

Literature Review

ShenYing Chen (2012) provided the situations in the US and China, but she analyzed another aspect [3]. She thought that aging population causes both changes in the economy (income) and demographics. In both countries, researchers predicted that the negative growth of working age will appear in the future because of aging population. In this case, there is likely to be slower economic growth. To solve the negative impact of the economy, the government may increase the minimum salary. However, the result is that the cost of production is increasing slowly, and the price of water is rising, driving up the cost of living for the average person. Furthermore, it will reduce the competitiveness of developed economies between the low-wage emerging economies, decrease the profitability of domestic enterprises, and prevent the willingness of enterprises to expand. These are the disadvantages of economic growth.

The aging population also raised another issue about the healthcare. Caley stated that the cost of healthcare has a strong correlation with the aging population.[4] With the development of medicine, diseases can be controlled, so life expectancy is longer than before. However, it is easier to get diseases as people get older. Therefore, the government needs to invest more money in preventative services to help people defer the disease and maintain health. She used three models to predict future costs. There were some differences among these models, but the results showed that more people over 65 would increase more costs, especially in the last years of their life.

From the literature review, all authors mentioned that aging population has a negative impact on the economy. The hypotheses are that the increase of aging population will reduce economic growth. In addition, examining the relationship in the model needs to control other variables which may affect the relationship. The tool cannot tell which variable needs to be considered, but from the

literature review we know that the health expenditure and income situation,can be the control variables which may influence the model.

Methodology

This paper wants to explore how aging population affects economic growth, so the aging population will be the independent variable and economic growth will be the dependent variable. The aging population can be represented by the proportion of population aged 65 and above which fits the normal idea of the aging population. The data comes from the World Bank and is based on the general definition of population, which counts all residents regardless of legal status or citizenship. Economic growth usually refers to a sustained increase in the per capital output of a country over a longer period of time. The level of economic growth reflects the growth rate of a country's economic aggregate over a certain period of time and is also a measure of the growth rate of the overall economic strength of a country or region, usually represented by GDP growth. This paper uses the multiple linear regression model as the technique to analyze the relationship between aging population and economic growth. One reason is that GDP growth and the populations above 65 are both at ratio level. Another reason is that multiple linear regression can control other variables to test the relationship between variables we are interested in. The first control variable is the health expenditure which is expressed as the percentage of GDP. This indicator includes the healthcare services and goods, and excludes the building and machines. The second control variable is income situation. This paper will use income index instead to represent income situation. The income index reflects the purchasing power of individuals and removes the influence of inflation.

Findings

Using graphics and tables to show the relationship between variables is the most intuitive way to present the information. The histogram of GDP growth is shown in figure 1. We can see it has a little negative skew. Most countries have high GDP growth, at around 3% and 4% annual growth. The left tail countries have negative GDP growth, some with negative 4% annual growth.
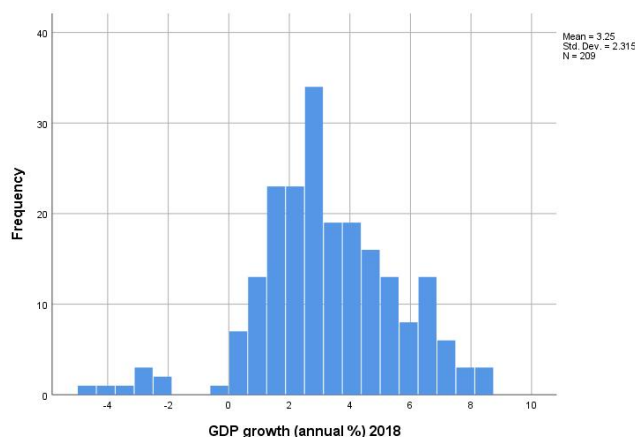
Then, I produced the histogram for population of 65 and above. This time I got a more positive skew. According to the definition of aging population above 7 percent of people over 65, while it seems that a lot of countries do not have an aging population,but quite a significant number of countries do.
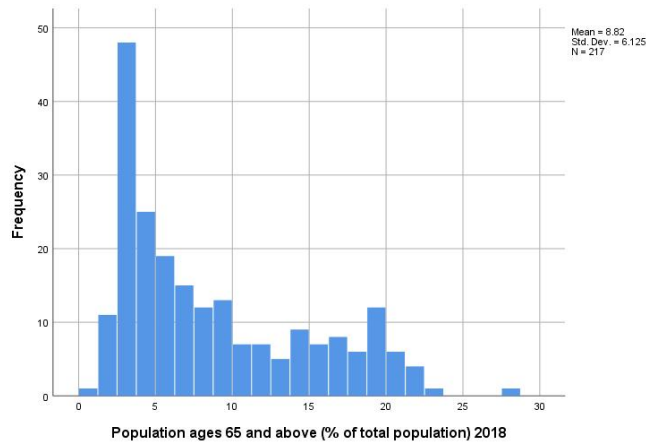
When I produce the scatterplot of the variables of GDP growth and aging population, the result does not show substantial linear association—it is more flat.
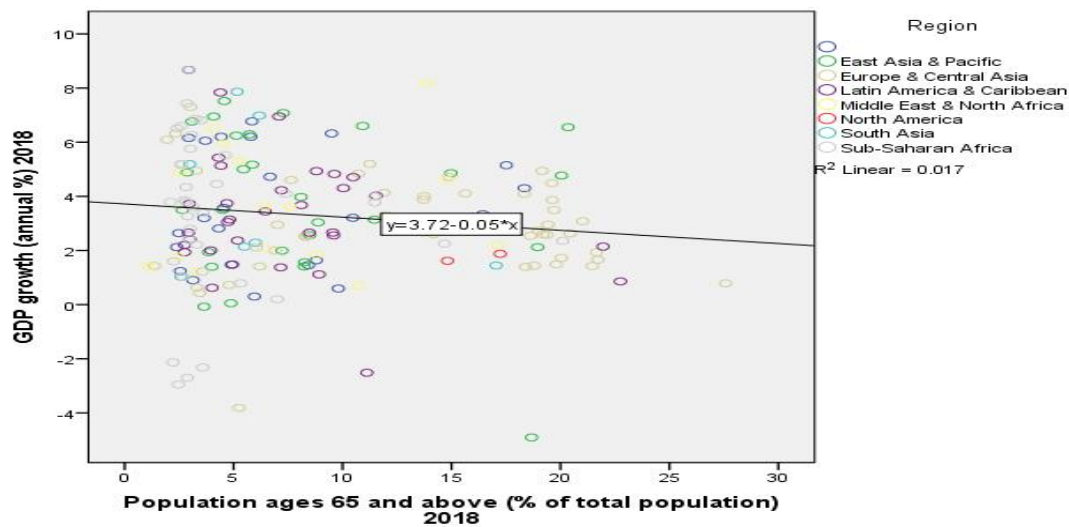
For each value of x, there are multiple corresponding y values, but there is still a slight constant relationship between the value change in x and value change in y. Since the plots have not cluttered in a specific range, the transformation of variables would not improve the model (The model becomes worse after transformation.)

Then using SPSS regression to calculate the formula, GDP growth = a -b*population ages 65 and above. This means the GDP growth is regarded as a dependent variable and population age 65 as an independent variable. The results are shown in the below charts.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.131[a]	.017	.012	2.282

a. Predictors: (Constant), Population ages 65 and above (% of total population) 2018

In this model, we can see the R is 0.131 which is the indicator that shows the weak relationship between aging population and GDP growth. The R square is 0.017 and it represents the independent variable and can explain only 1.7 percent of variation of dependent variable.

Conclusion

In conclusion, the increasing number of senior citizens has weak negative influence on economic growth. Nevertheless, we need to treat the conclusion carefully, because other control variables should theoretically affect economic growth, but results in the

opposite. Some researchers think aging population will reduce investment consumption, so economy will not grow as rapidly as before. However, aging population can stimulate more healthcare services. With more senior citizens, the consumption can also increase. It is clear that aging population will put more pressure on the pension system and the young generation.[5]Cheap labor has been replaced by robots and artificial intelligence, and the number of high-end elites has fallen sharply, while most people in the middle class "unfit for a higher post but unwilling to take a lower one in their work" can easily cause turbulence in the social talent market and the employment labor market. From this point of view, not only will an increase in population cause a shortage of job opportunities, but the decrease in the young population will also cause a rapid increase in employment pressure. All these additional factors may connect the relationship between aging population and the economic situation.

References

[1] Lunenfeld, B. & Stratton, P., 2013. The clinical consequences of an ageing world and preventive strategies. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 27(5), pp.643–659.

[2] Rechel B., Doyle, Y., Grundy, E., Mckee, M., Rechel, B., & Doyle, Y., et al. (2009). How can health systems respond to population ageing.. (Doctoral dissertation, WHO Regional Office for Europe).

[3] Caley, M. & Sidhu, K., 2011. Estimating the future healthcare costs of an aging. population in the UK: expansion of morbidity and the need for preventative care. *Journal of Public Health*, 33(1), pp.117–122.

[4] Nargund, G. (2009). Declining birth rate in developed countries: a radical policy re-think is required. Facts Views & Vision in Obgyn, 1(3), 191-193.

About authors: Liang Bian(1997), male, Beijing, master degree, Junior economist, University of International Business and Economics (UIBE).

Corresponding author: Kelin Zeng(1999), male, Beijing, master degree, Junior auditor, University of International Business and Economics (UIBE).