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The Effects of Population Aging on GDP

Ruiqi Liu[1,a,*]

[1] *College of Arts & Sciences, Boston University, Boston MA 02215, USA*
a.rliu07@bu.edu
**corresponding author*

Abstract: The intensification of population aging affects all aspects of society. Among them, it has a particular impact on economic growth. Some scholars believe that aging will stimulate economic development, while more people believe that aging will burden the economy. Based on research on the five major gross domestic product factors: consumption, investment, government spending, net exports, and the labor market, the aging population brings more harmful effects to the growth of gross domestic production rather than optimistic effects. The aging population only benefits the government expenditure that the government consumes and invests more funds in the aging population. The increasing government expenditure directly raises the gross domestic product. By contrast, the excessive government spending will trigger more critical fiscal problems. Thus, compared with the negative impact on GDP in other areas, the increase in government spending cannot offset those adverse impacts. The government has to take steps to balance the plethora of adverse effects.

Keywords: aging population, gross domestic product, domestic market, international trade

1. Introduction

Nowadays, the intense aging population is troubling more and more countries. The reason is that aging has an enormous impact on the social system, including social structure, health care system, elderly community construction, and especially on economic development. It is confirmed that long-term economic growth and social resources are both impacted by population aging consequently [1]. While the growth of the economy of a country basically depends on the Gross Domestic Product (GDP). Gross Domestic Product comprises consumption, investment, government spending, and net exports. It is closely related to the economic growth of a country. There are many factors that can affect these components, among which the aging of the population has attracted the attention of many experts and governments. The World Health Organization predicts that one-six of the world's population will be over 60 in 2030, which means that the rapidly aging population will further lead to economic issues or even a sluggish economy [2]. Why does population aging affect the trend of overall GDP? Will it have a positive impact on the economy? How to reduce the economic problems of an aging population? All of these questions are worthy for people to discuss and then explore the relationship between the aging population and GDP. This article will mainly focus on consumption, investment, government spending, net exports and the labor market, the five most vital factors of GDP. Then, conclude the consequence of the aging population on GDP by the effect of an aging population on each aspect.

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2. Literature Review

Yan and Hu indicated that three consumption structures could summarize eight categories of consumption expenditure, which are survival type, enjoyment type, and development type [3]. According to the OLS regression analysis, there is a negative correlation between the aging population and enjoyment type of consumption. It proves that this consumption aspect is not chosen by older people, which will definitely influence consumption as a whole. Qi and Zhang established the Logit model to analyze the relationship between age and investment preference [4]. In the model, the independent variable is age, and the dependent variable is investment preference. The research results show that people have a declining appetite for investment risk with age. Wong and Yeung stated that the Hongkong government spent tremendous capital on the aging social welfare and health care system. And there will be an upward tendency of these two sectors of capital inputs [5]. However, this study did not discuss too much content about how increasing government expenditure affects the Gross Domestic Product. Qian and Liu concluded that aging harms the labor market by analyzing a series of indicators such as labor supply, labor cost, and old-age dependency ratio. In addition, they suggested that the aging population indirectly affects human capital investment, personal revenue, and labor mobility [6]. Then, Wang and Han demonstrate that aging population decreases the net export and increases the exchange. It is not good for the international trade and the global market [7].

3. Effects

3.1. Consumption

Consumption is occupied a large proportion of the Gross Domestic Product. An author claims, the inherent consumption concept of the elderly is that they prefer to save money rather than consume. Even if some countries adopt a quite perfect old-age pension system with many annuities, the elderly are still reluctant to choose high consumption. The analysis concludes that their inherent thinking is difficult to shake and correct [3]. Many of today's elderly have experienced "bad years" such as poverty, war, famine, disease, and so on. Such memories make them understand the hardships and difficulties of life, so they are not hedonistic. Older adults view saving as a form of security, which can offer their children a higher standard of life. For example, excellent education resources, a better living environment, splendid life experience, etc. In addition, the elderly still prepare funds for their medical expenses since the pension is not as much as the average income, which means that the revenue of the elderly decrease. Even though the pension and insurance system is quite maturated right now, changing the entrenched idea of the elderly still be challenging. When the revenue fluctuates, the elderly is more reluctant to spend too much money in the marketplace. This circumstance will result in the demand decreasing for an extended period. And if the supply keeps constant, the price of goods and services will drop dramatically. The decline in consumption level directly affects GDP and economic development. Ultimately, the Government must formulate relevant policies and regulations to intervene in this financial situation.

3.2. Investment

Economic development is an inseparable part of the investment. However, investment is risky, and everyone has different investment preferences. By studying the impact of population aging on family investment preference, the result shows that there is a negative relationship between investment risk and age [4]. So elders are more likely to pursue stable investments than risky ones. It is well known that the return on investment depends on the total investment cost, total investment quantity, and speculative risk. In most cases, investments with greater risk tend to bring higher returns. Take the stock market as the example; there are many factors that affect the price of the stock market, including the overall economic situation, policy revisions, changes in interest rates and exchange rates, inflation and deflation, market fluctuation, the financial condition of the listed company, etc. But these are the uncontrollable factors that are difficult to predict. Therefore, many news reports that some people get rich overnight while someone goes bankrupt because of the stock market crash. Only a few people can get rich in such a short period through a high-risk and high-return investment. The process of accumulating wealth is challenging. Most people spend their whole lifetime and energy to achieve it. Thus, "the investment preference of the elderly is often conservative. If this tendency persists over the long run, it will eventually lead to a declining supply of higher-risk investment products and an upward supply of lower-risk ones. There is a general danger that the return on assets will decline, impacting the financial market's health and the future pensions system [4]. It is not conducive to the economic development of a country. Also, a large number of conservative investors will have adverse effects on the GDP per capita.

3.3. Government Spending

People infer that the aging population will increase the expenditure of government departments, including pension and insurance systems, health-care systems and other related industries. According to estimates, Hongkong's recurrent government spending on social welfare and health will amount to $151.0 billion in 2018 and 2019, or 37.1% of all recurrent government spending. Recurrent spending in these two areas increased by 181% between 1998–1999 (from $53.7 billion to $151.0 billion) [5]. From these data, it can be observed that government spending is becoming higher and higher because of the severe population aging. There is a positive relationship between government spending and GDP. The higher the government spending, the higher the GDP. Government spending promotes economic development, creating employment rates and productivity. One of the most profitable industries is the medical industry. Due to a growing and aging population, the Association of American Medical Colleges (AAMC) predicts that by 2023, domestic demand for physicians will outstrip supply and experience a shortage of physicians as many as 121,300 [8]. It is an opportunity to create job positions and develop the medical industry. The study case only mentions the shortage of physicians, but so many fields correlate with it, and they experience the same dilemma. The hospitals are not large enough to contain patients. The nurses are too busy to take care of several patients simultaneously. The excessive patient demands that they need more medical apparatus and produce considerable medical waste. This is just superficially observation about human demand. There is numerous complex demand which needs more professional exploration. The process of meeting these demands boosts the economy and increases GDP. GDP is equal to all value added in the economy. Developing the industry and job positions creates more goods and services. To some extent, value is the income that a person generates. Therefore, more people having an income will make more value. Eventually, the GDP can achieve a higher level.

However, the excessive growth rate of the aging population will pressure government spending. According to the newest data, In China, the proportion of funds used in the field of pension security to the total government expenditure continues to increase up to 19.23%. At the same time, other parts such as education, science, and technology in government expenditures have not seen a significant increase in the past ten years, and some items have a downward trend [9]. Aging not only intervenes in government spending but also diminishes the budget on other significant social areas. In the long run, it will lead to social development imbalance and turbulence. For instance, when the aging problem occupies the government's education funds, educational resources will be significantly regressed. Inadequate educational funding may cause too many inevitable issues. Firstly, insufficient funding leads many students not to achieve established performance benchmarks. It prevents schools from providing excellent professors, the best facilities, and a high-quality academic environment for students. Second of all, low-income students will get less support. Educational funding heavily relies on the government [10]. When the government budget on education reduces, low-income students will get fewer scholarships and free schooling opportunities. It can thus be seen the government has to pay more attention to the aging population issue.

3.4. Labor Market

According to the research, the number of working-age people is stagnant or even decreasing in all severely aging developed economies, while the number of retirees is rising simultaneously. So, there is a reduction in the overall employment rate, which is calculated as the percentage of the working-age population to the entire population. As measured by gross domestic product (GDP) per capita, material prosperity is at risk of slipping under otherwise stable economic conditions [6]. This study mentions a considerable issue that population aging increases the number of retired population and reduces the employment rate. The employment rate represents a country’s labor resources, which determines the total productivity, contributes to economic development and protects social stability. The extreme population aging leads to workforce reduction and creates job vacancies. Chinese economists indicate that there is a negative relationship between the elderly and working-age populations. When the proportion of the retired population becomes large, the working-age population will drop and the scale of the labor supply will decrease. Second, it reduces the labor force participation rate. As the age increases, the labor force participation rate of the elderly decreases, resulting in a decline in the total labor force participation rate [6]. As a result, productivity becomes less and less, leading to a downward in sales revenue. Thus, the firm chooses to pay cuts and lay off workers to maintain the operation of the enterprise. In the meanwhile, the low employment rate will reduce consumption.

3.5. Net Export

Net export is exports minus imports, which reflects a country’s international trade. The aging population potentially influences the net export. Most countries like export asset-intensive products, while the imported products are based on labor-intensive [11]. The side reflects that the labor costs are overpriced. The price of imported goods is much more competitive than the labor cost. However, as mentioned above, population aging reduces the labor force participation rate and results in low productivity. Labor shortage may influence the manufacturing industry, generating a diminished export capacity. The authority of the author’s analysis concluded that the regression results of the intermediary effect show that an increase in the old-age dependency ratio will reduce net exports, and a decrease in net exports will make the real exchange rate appreciate [7]. The research indicates that the old-age dependency ratio negatively affects net export. The old-age dependency ratio is an economic indicator that can reflect the result of population aging. It means that how every 100 working-age population will support many older people. Table 1 exhibits the old-age dependency ratio of the top 10 aging population countries worldwide. It is obvious that the old-age dependency ratio in each country is a noticeable rise tendency in the past ten years. The trend verifies that every 100 working-age population will support more elderly, which impacts the net export of their countries.

Table 1: The old-age dependency ratio of the top 10 aging population countries [12].

Age dependency ratio, old (% of working-age population)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021

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Table 2: (continued).

Japan	39.53	41.58	43.72	45.55	46.96	48.13	49.10	49.92	50.57	50.97
Italy	32.28	32.95	33.65	34.25	34.74	35.17	35.58	36.10	36.65	37.19
Germany	30.91	31.09	31.41	31.82	32.22	32.64	33.09	33.62	34.17	34.66
France	27.69	28.61	29.56	30.47	31.29	32.08	32.84	33.55	34.20	34.78
United Kingdom	25.92	26.60	27.15	27.60	27.99	28.36	28.73	29.14	29.49	29.83
Canada	21.48	22.21	22.92	23.63	24.33	25.02	25.70	26.42	27.25	28.17
Australia	21.10	21.60	22.08	22.55	23.02	23.46	23.90	24.36	24.89	25.47
United States	20.34	20.87	21.28	21.59	22.18	22.87	23.44	24.12	24.86	25.63
Russian Federation	17.95	18.35	18.92	19.58	20.18	20.81	201.43	22.11	22.84	23.38
China	12.46	12.88	13.38	13.99	14.69	15.49	16.37	17.24	18.16	19.01

4. Suggestions

The aging population takes advantages and disadvantages to the GDP. There are three main issues: (1) elderly is unwilling to consume. (2) aging population reduces the labor workforce and employment rate. (3) the old-aging dependency is continuously growing.

4.1. Consuming Issues

For the first issue, the immediate solution is to improve the financial security of older adults. To change the consumption idea of the elderly, the Government can standardize the old-age security system and increase the pension within the scope of ability to raise the income of the elderly. In addition, it promotes the healthy development of the aging industry so that the elderly can consume confidently and enjoy consumption [3]. These methods appease the orderly's thoughts so they can spend more money without concern.

4.2. Labor Shortage Issues

For the issue of the labor workforce and employment rate, there are two solutions. In the first place, the Government can focus on the investment in human capital and promote the quality of labor supply. At the same time, the related departments should encourage an increase in the fertility rate and take effective measures to increase the labor force participation rate. In addition, focusing on the investment in human capital will benefit the quality of labor supply, including upgrading the education system and standardizing staff training. Moreover, extending compulsory education to high school is an immediate policy measure to respond to the changes in the labor market situation [13].

4.3. Old-age dependency ratio issues

Further, stimulate the competitiveness and flexibility of the labor market and establish a safe and effective market system. On the other hand, postponing and adjusting the retirement rate can remedy the labor shortage [13]. So that the elderly has more time to create more values at work. At the same time, the market can become more balanced, stable, and sustainable. For the last problem, the high old-age dependency ratio (OADR) has a downward trend by adjusting the retirement rate. The empirical analysis presented in the research shows that the adjustment of the pension age to age 67 has been effective in stopping the increasing trend in the OADR values [14]. However, this empirical analysis still needs more data and evidence to support the authenticity of the conclusion. Many factors

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will impact old-age dependency, making it difficult to control. But it is significant progress for people to explore solving the high old-age dependency ratio.

5. Conclusion

In this research, through the analysis of consumption, investment, government spending, net export, and labor market, the aging population has an adverse impact on most areas except government spending. Elderly consumers reduce domestic consumption due to lower income and frugal spending attitudes. In their mind, saving money is much more significant than spending money. And the conservative investment preferences of the elderly are not conducive to developing the investment industry. The elderly are thoughtful and risk-averse, meaning they refuse to bet their hard-earned money all their lives on high-risk investments. They prefer less risk rather than high revenue. In addition, the aging population leads to an inactive labor market, such as labor shortage and low labor participation rate. These problems cause employment increase and low productivity. The lower cost of export goods is well known to be much more competitive in the international market. However, the low labor participation rate leads to a higher labor cost, which means that the cost of the product increases. So, the high price of products quickly loses competitiveness, which will decrease the net export. Besides, less net export makes the exchange rate increase. High exchange rates are not beneficial for trade between countries. Therefore, it will definitely prevent the growth of the gross domestic product. Nevertheless, the aging population raises government spending on the pension and health-care systems. It will drive the development of related industries and creates more entrepreneurial opportunities. Thus, the gross domestic product will be energetic and recovered. In summary, the aging population negatively influences the gross domestic product. There are several measures to correct these negative influences. Rising the retirement rate, Investing human capital, and increasing fertility can solve the labor shortage problem. The government should improve the pension system to protect the interests of the elderly.

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