

Labor Supply and Sustainable Economic Growth: A Preliminary Study Based on Demographic Dividend

Biao Gu^a, and Yue Chen^{b,*}

Shanghai University, Shanghai, China

^agubiao2000@hotmail.com; ^{*b}alison_cy@163.com

Keywords: Labor supply; Economic growth; Demographic dividend; Education

Abstract: It is vital to promote economic prosperity in both economics and politics. Therefore, this paper is thinking about the situation compared with the years when the growth rates are in a high level from the perspective of demographic dividend. If the effect of demographic dividend has gone, this paper will talk about the influence caused by it and will give some suggestions about it. This paper mainly uses Excel and several resources including dependency ratio from China Statistical Yearbook to research if Chinese demographic dividend has gone and the result of it is yes. Meanwhile, this paper will talk about the change in periodic unemployment and natural unemployment brought by it. Finally, this paper argues that we must push the two-child policy with assistance from all departments. Secondly, we should improve human capital, mainly in education. Finally, we should help individual labor force set correct employment concept.

1. Introduction

As for the demographic dividend, people may often hear in the media that a big country like China needs to know that the golden age of economic growth, which used to rely on the demographic dividend as a driving force, has passed. What we should do now is to find new ways to stimulate the economy so that it can return to its former glory in the coming years or even decades. The concept of a demographic dividend was proposed by Andrew Mason in the late 1990s in an article in the 43 issue of Asia-Pacific Population and Policy magazine. He believes that in the early stage of the decline in the birth rate, and the rate of decline in the birth rate is faster than the speed of population aging, the population structure at this time is conducive to economic development. When in such an economic state, that is, at this time and for a long time in the future, the child dependency ratio and the elderly dependency ratio are at a stable low level, the age distribution structure of the total population will show the shape of "big in the middle, small at both ends". At this time, the young and middle-aged labor force is abundant, and the family burden that each labor force needs to bear is relatively light, and unemployment. The rate is low and the socio-economic growth rate will be faster. The purpose of this study is to explore whether China's demographic dividend has disappeared and the impact and Countermeasures after its disappearance.

2. The Impact of Population Dividend on Economic Growth

Different scholars have different views on the impact of demographic dividend on economy. First, the relationship between demographic dividend and economic growth. Mu Guangzong (2008) concluded that the demographic dividend provided only a possible impetus from the dislocation between the rapid economic growth period of Korea and Japan and the demographic dividend. Zhang Chewei (2007) thinks that the demographic dividend is more like an opportunity. Only by seizing this opportunity can the demographic dividend really promote economic development. Jiang Zhenghua (2009) directly denied that China had a demographic dividend. He thought that this statement had no basis, because he believed that the quality of the labor force should also be taken into account.

Secondly, the contribution of China's demographic dividend to the economy is analyzed from the

perspective of the model. Firstly, Cai Fang and Wang Dewen (1999) analyzed the factors of China's economic growth during 1982-1997. They mainly built models and fitted them according to statistical data. From the experiments, they believed that the material capital contributed the most to the average annual GDP growth rate of 9.5, accounting for 29.02%, and the contribution of labor force growth and human capital was almost 23.71% and 23.70%, while the unexplained part accounted for 23.57%. Among them, the unexplained part also includes the allocation of labor force accounting for 20.23%, and technological progress accounting for 3.34%. Secondly, according to Wang Dewen (2008), demographic transition can bring about adequate labor supply and high savings rate, which contributes about 1/3 to China's economic growth. Finally, Wang Xiaoqin and Wang Hongmei (2007) use Cobb-Douglas production function to argue that the demographic dividend promotes economic growth and development from three aspects: labor participation rate, saving rate and labor allocation efficiency.

This paper argues that the impact of demographic dividend on long-term economic growth mainly has two points: First, the demographic dividend increases the supply of labour. The supply of labor force is one of the most basic elements of economic development. When the supply of labor force is sufficient and the age structure of labor is relatively young, the competitiveness of labor-intensive industries will be in an advantageous position. Moreover, because of the relatively low child support at this time, it can reduce the burden of the labor force, not only improve the quality of life, but also be able to participate more in economic production and better put into work. Second, the demographic dividend promotes the growth of the savings and investment rates of the relevant economic entities. Because of the lighter burden in the period of demographic dividend, the marginal propensity of households to consume will be relatively small at this time, which will lead to the growth of savings rate and the transformation of savings into investment, thus achieving economic growth. Secondly, due to the lower elderly support and less social security expenditure, it is conducive to the accumulation of social wealth.

3. Estimation of Population Dividend

3.1. Measuring and Calculating Methods.

There are two methods to calculate the demographic dividend at present. The first one is to adopt the method of multiple regression. Like Cai Fang's previous research on the contribution rate of various factors to the economy, it uses the existing data to study the change of the contribution rate of population change to the economy. The software includes Eviews and SPSS. If it is extremely low or even negative, then the demographic dividend has disappeared. The second method of calculating the demographic dividend is to calculate the dependency ratio according to the ratio of the effective producers to the effective consumers. There are generally two indicators: the child dependency ratio and the elderly dependency ratio. The data can be obtained from the China Statistical Yearbook. The dependency ratio used here is different from what is commonly referred to as dependency ratio. This method of calculating the population dividend is based on the index of "the growth rate of per capita output". The growth rate of per capita output is determined by two parts. One is the increase of per capita growth rate brought about by the increase of productivity, the other is the increase of per capita output brought by the increase of population. Assuming that the economic growth brought by the increase of productivity remains unchanged, the growth rate of dependency ratio will change at this Conversion is equal to the contribution to the growth rate of per capita output, that is, the demographic dividend we are seeking. This article is discussed here according to the dependency ratio.

3.2. Data Description.

This paper uses the total dependency ratio to measure the demographic dividend level of our country. The three are the proportion of the population aged 0-14 years old in the total population, the proportion of the population over 65 years old in the total population and the proportion of the population except the age of 14-65 years old in the total population. The data came from China

3.3. Measurement Results.

To visualize the temporal characteristics of China's demographic dividend, Fig. 1-3 shows the dependency ratio change from 1990 to 2014. The results are as follows: Firstly, it can be seen from the figure that the child dependency ratio in our country is declining, mainly because of the implementation of family planning policy, which makes the birth rate of our population decline rapidly. At the same time, the fertility intention of the population of the right age has been greatly reduced, from 41.5% in 1990 to 22.5% in 2014, and the dependency ratio has dropped by 19% in 24 years. The burden of raising children in families has been reduced, which makes the labor force more involved in economic activities. The proportion of household income spent on basic living needs has decreased.

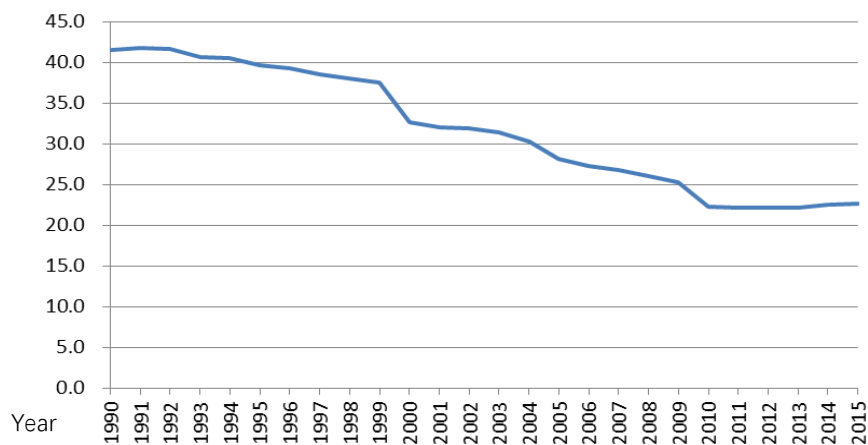


Figure 1. Child dependency ratio

Data source: China Statistical Yearbook 1990-2015

Secondly, from the perspective of the old-age dependency ratio, it shows an upward trend. Specifically, in the three years from 2000 to 2003, the old-age dependency ratio is in a period of rapid rise, and then the growth rate tends to be flat in six years, until 2010, it returns to the trend of rapid rise again. The reason may be that China's population born in the 1950s and 1960s has gradually entered the ranks of the elderly population, and because of the continuous development of China's medical level, the average life expectancy in various regions has increased rapidly, which makes the size of the elderly population rise rapidly and increases the burden of the elderly population.

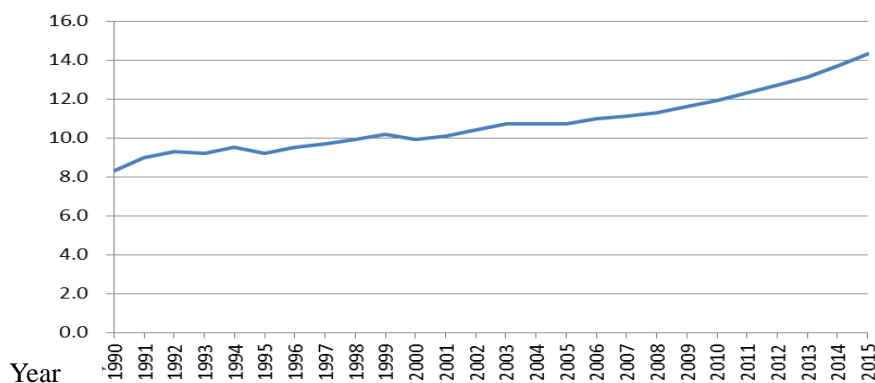


Figure 2. Old-age dependency ratio

Data source: China Statistical Yearbook 1990-2015

Thirdly, from the total dependency ratio, there is a fluctuating downward trend, but the tail has an upward trend. It can be inferred that the total dependency ratio will continue to rise in the next few years. From Fig. 1 and Fig. 2, it can be inferred that the rapid increase of the old-age dependency ratio is the main reason for the upward trend of the total dependency ratio.

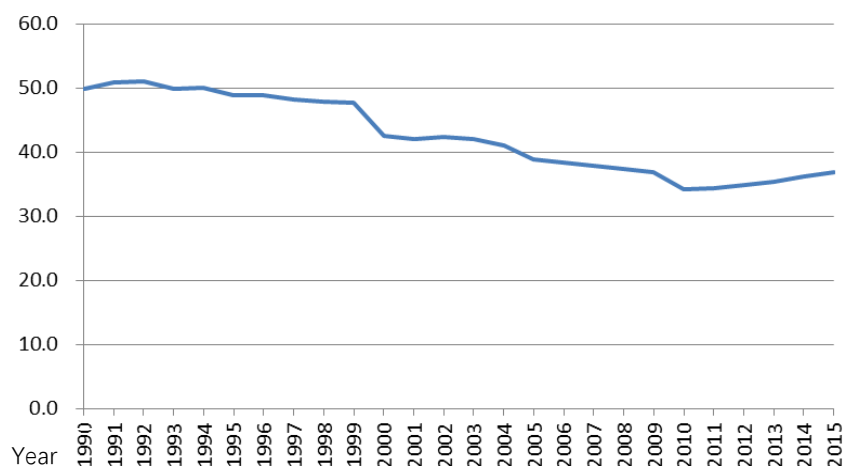


Figure 3. Total dependency ratio

Data source: China Statistical Yearbook 1990-2015

4. Conclusion

From Figure 1 to Figure 3, we can see the change of dependency ratio in China during 1990-2014. With the boundary of 2011, the declining trend of child dependency ratio before 2011 has become the main reason for the declining trend of total dependency ratio. The burden of child dependency in the labor force is lighter. After 2011, the declining trend of child dependency ratio is obviously slower than that of elderly dependency ratio. Overall, the total dependency ratio is on the rise. At the same time, the liberalization of the second child policy last year will undoubtedly make the child dependency ratio have a distinct rising process in a short period of time, while the elderly population is still in the process of rising. It can be expected that the total dependency ratio will continue to rise in the next few years, not excluding the possibility of a sharp rise in the process. From the above analysis, we can see that China's demographic dividend is declining and is gradually disappearing.

5. Employment Situation

First, according to the distribution of the labor force in the three major industries, the labor input of the primary industry is obviously declining; the secondary industry is tortuous upward trend, and has a downward trend; the tertiary industry is steadily rising, and has an upward trend. The decline of the primary industry employment population is due to the influx of a large number of rural labor force into cities in recent decades, the trend of urban-rural integration is obvious, urban and rural infrastructure has been improved, and because of the development of other industries, labor force is no longer limited to investment in agriculture and other related industries. Although the secondary industry has risen in general, it has only risen by less than 10% in the past 25 years, less than 20% in the tertiary industry. This is due to the lessons learned from history. Historically, because we have blindly pursued the increase of industrial output, it has brought many "side effects". In the new period of reform and opening up, the door of the country opens to the outside world and various opportunities begin to increase, which makes the development of the tertiary industry such as service industry develop rapidly.

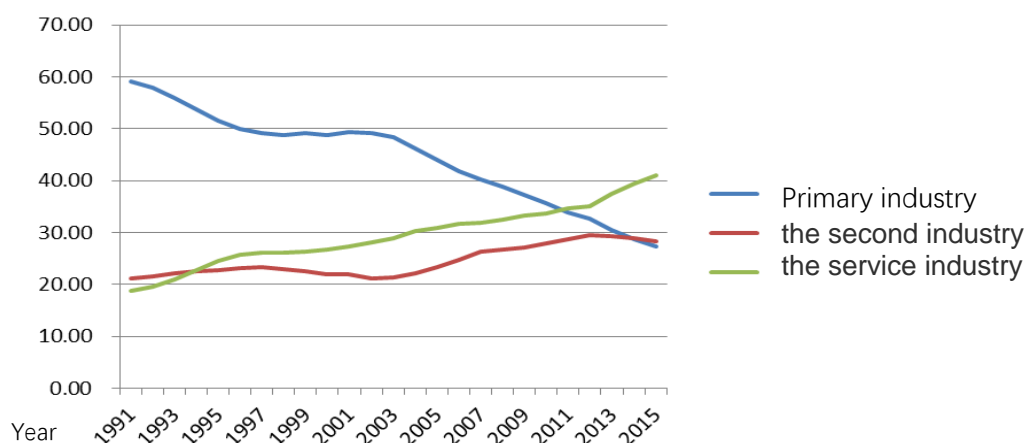


Figure 4. Proportion of Employed Population in Three Major Industries

Data source: China Statistical Yearbook 1991-2015

Secondly, from the perspective of unemployment rate, the unemployment rate showed a tortuous upward trend from 1991 to 2014. Among them, the obvious increase in 1998 is due to the impact of the Asian financial crisis in 1997 on our country, and then the employment rate declined due to the introduction of relevant policies. However, the unemployment rate has been rising sharply since 2006, and from the tail, the unemployment rate is still likely to rise in the next few years, and the employment problem is worrying.

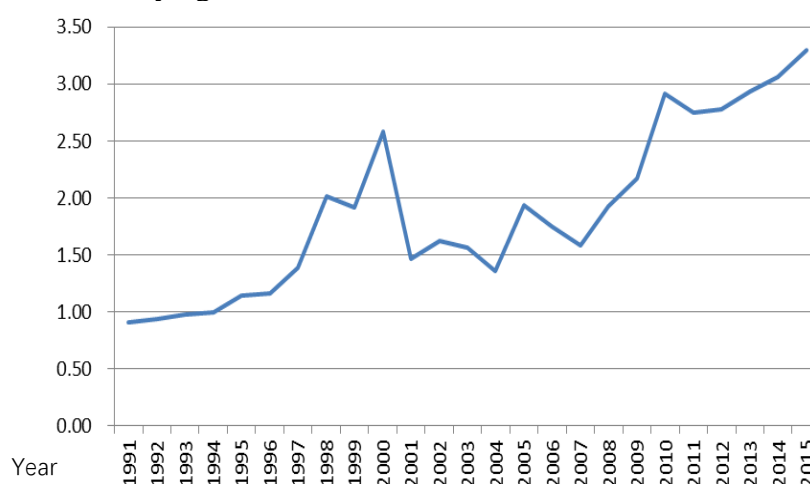


Figure 5. Unemployment Rate

Data source: China Statistical Yearbook 1991-2015

6. Loss of Population Dividend and Employment

The disappearance of the demographic dividend and periodic unemployment. As can be seen from Figure 6 and Figure 7, the total GDP has been rising, but the growth rate began to decline sharply from 2006 to below 7% in 2015, and the economy has begun to be under downward pressure. This is because the disappearance of the demographic dividend has slowed down the growth of production and further increased the unemployment rate. Point 5 shows that cyclical unemployment begins to appear. There are two reasons for cyclical unemployment: one is Because of the existence of wage rigidity, we can see from Keynesian effect that nominal wage cannot change with price, real wage of workers decreases, cost of manufacturer decreases, and manufacturer will expand production. But when there is a liquidity trap, the interest rate cannot change with the expansion of money supply, or the elasticity of investment expenditure is poor, and the interest rate has no effect on investment, the Keynesian effect will not appear. Second, the total demand of the product market is insufficient, the market is depressed, and the market of the

manufacturer's products is not good. The manufacturer will cut the redundant workers, resulting in unemployment.

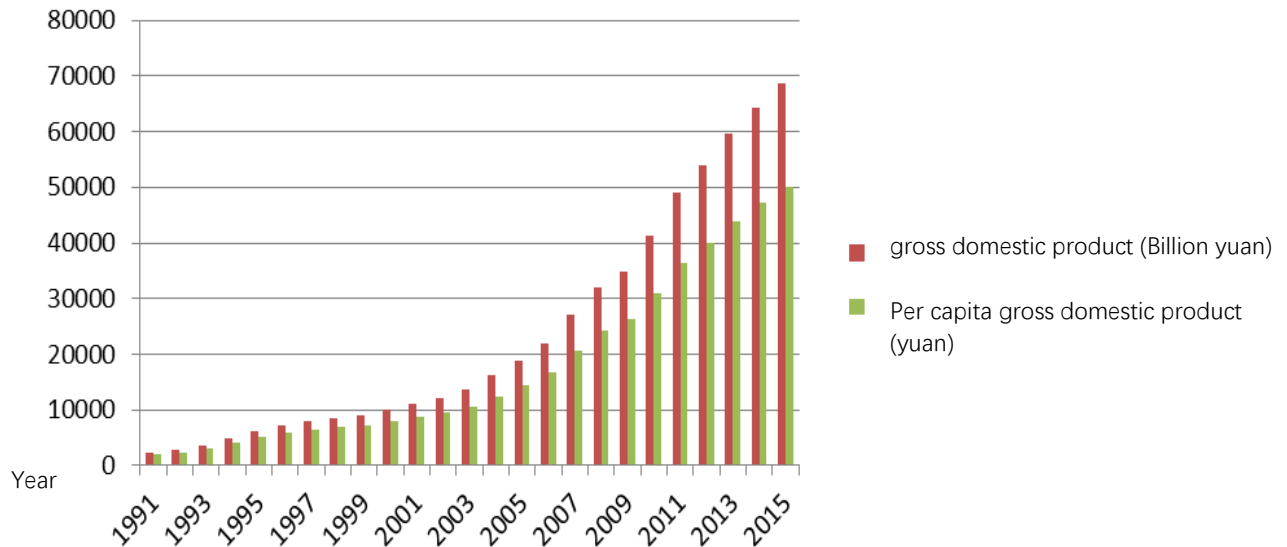


Figure 6. Changes in gross domestic product and per capita gross domestic product

Data source: China Statistical Yearbook 1991-2015

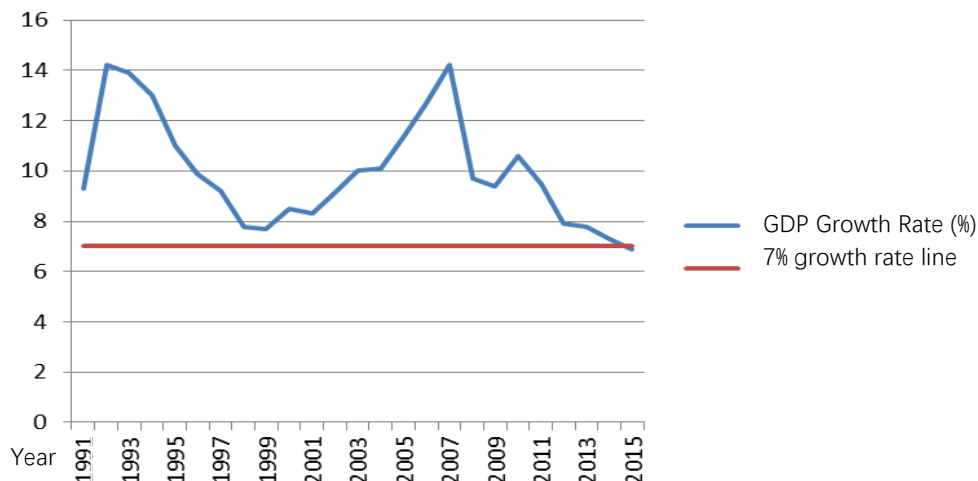


Figure 7. Gross Domestic Product Growth Rate (based on the previous year)

Data source: China Statistical Yearbook 1991-2015

The disappearance of the demographic dividend and the natural unemployment rate. The existence of natural unemployment rate is mainly due to frictional unemployment and waiting unemployment. Frictional unemployment is mainly due to inadequate employment information in the labor market, different preferences and abilities of workers, different nature of work, and the cost of labor mobility in different regions. In the long run, the employment rate decreases and the natural unemployment rate is greater than zero. Because of the disappearance of the demographic dividend, it can be said that at this time, the market is depressed, the production quantity is insufficient, the scale of the manufacturer is insufficient, and the number of recruiters is not large. If this situation is maintained for a long time, it will make it difficult for workers to find jobs, the cost of finding jobs will increase, the time required for the labor force to find a job successfully will be prolonged, and frictional At the same time, the labor market is difficult to achieve equilibrium, and the unemployed labor force will increase more than before. In the long run, the natural unemployment rate will increase indirectly because of the disappearance of the demographic dividend.

7. Policy Recommendations

7.1. Changing the Population and Reproductive Policy and Continuing to Liberalize the "Two-Child Policy".

From the previous analysis, we can see that the total dependency ratio in China is on the rise, and the demographic dividend has begun to disappear gradually. At the same time, according to the data released by the National Bureau of Statistics, China's working-age population declined absolutely for the first time in 2012, about 3.45 million less than last year, which means that China's economy may enter a new period of development in the next few years. In fact, even if teenagers reach the age of 15, they can not immediately become labor force, but the liberalization of the second child policy is undoubtedly a boost to the economy. First, the increase of newborn babies directly promotes the development of related industries. In the long run, the supply of labor force will be considerable in the future. With the improvement of education system, the quality of labor force will be improved in the future. This will promote the future economy, and the demographic dividend effect will continue to appear. For the implementation of the "second child policy", the following points should be paid attention to:

Education and health: The increase of newborns will lead to the shortage of educational resources. At this time, we should strengthen the investment of supporting educational resources to ensure that the education of newborns is guaranteed. For medical and health institutions, gynecologists and obstetricians should be appropriately increased, resources that each woman should enjoy should be coordinated and allocated, and matters needing attention should be publicized to the broad family. Both sides should be well prepared to better meet the arrival of the second child birth climax.

Family: Fertility is the most important issue for a family. For a family, we should carefully consider the policy of two children separately, and then make a decision on whether to have children by integrating all factors. Families should also treat two children fairly and avoid factors.

7.2. Increasing Human Capital and Reforming Education System.

There are many ways to improve human capital, the usual way is to improve the length of education and increase training. We must admit that it is a relatively long process to improve human capital by increasing the number of years of education, but it is also a necessary process. Although the investment in education for teenagers may be reflected after a long period of time, it is a considerable future wealth. Therefore, we should reform the education system and cultivate talents adapted to the development of the times. We should start from the following three aspects: first, as a labor force sub-cultivation institution, universities should cultivate society in accordance with the development requirements of society and the times. There are not many talents in need. To achieve this requirement, colleges and universities need to communicate with enterprises, the mechanism of communication should be smooth, the means of communication should be diverse, and the purpose of communication should be clear. Secondly, after knowing what kind of talents enterprises need, colleges and universities should make clear and detailed curriculum settings to ensure the relevance and scientificity of professional settings, so as to truly cultivate professional talents. Finally, schools should actively build information platforms. Without a good job-hunting platform, no matter how excellent the students are, they can not make the best use of their talents. Nowadays, we are in the information age, and the platform set up by universities for the employment of college students can not leave such an environment. Colleges and universities independently strengthen the construction of information platform, establish a comprehensive employment information network, and do a good job of students' employment guidance, such as career planning and other activities.

7.3. Cultivating College Students' Correct Views on Employment and Career Choice.

As the saying goes, "Why sweep the world without sweeping a house?" See the importance of oneself. Correct employment outlook can help college students find suitable jobs quickly, but wrong employment outlook can not solve the employment problem quickly, and it is also a burden for family and society. Many college students do not know their major when they first enter the

University campus, and then they are not interested in the relevant courses of the major, but they think they have to find a job related to the major after graduation. But because of the previous weak foundation, it is difficult to develop their skills in this field or find a job. If they can understand themselves correctly, they will know themselves well. It will be much easier to find a position with your own strengths and weaknesses, and you will be happier to work. Why not? In a word, every student should find a suitable career, fully combine his personality and interests, not stick to his major, not to follow the trend, and establish a correct view of employment, to find the most suitable job.

8. Conclusion

Labor supply will affect economic growth through the way of "demographic dividend". China's current "demographic dividend" is gradually disappearing. The second child policy is also a way, one from the supplier, the other from the labor supply. However, the policy of second child has a higher future return on stimulating the economy in the labor force. What can be seen from the perspective of labor force is the reform of training and education. That is to say, the effect of the increase of human capital on economic growth is generally due to the increase of labor productivity brought about by the increase of human capital. Therefore, in the short term, from the perspective of labor force, human capital should be improved to maintain sustainable economic growth.

References

- [1] Cai Fang. Population Transition, Population Dividend and Lewis Turning Point [J]. Economic Research. 2010, 4:4-13.
- [2] Cai Xin. Labor shortage: Should we take precautions [J]. Population Science of China. 2005, 6:11-16+95.
- [3] Cai Fang. Population Transition, Population Dividend and Lewis Turning Point [J]. Economic Research. 2010, 4:22-34.
- [4] Cai Fang, Wang Dewen. Sustainability of China's Economic Growth and Labor Contribution [J]. Economic Research. 1999, 10:62-68.
- [5] Cheshiyi, Guo Lin. Population dividend and economic growth under structural change and institutional change [J]. Population Research. 2011, 2:3-14.
- [6] Chen Youhua. Population dividend and China's economic growth [J]. Journal of Jiangsu Institute of Administration. 2008, 04:58-63.
- [7] Chen Yicheng. Research on China's Labor Supply Based on Lewis Turning Point [J]. Market Weekly (Theoretical Research). 2013, 7:135-136+68.
- [8] Ding Renchuan, Zhang Aviation. Current research status and review of China's "demographic dividend" [J]. Journal of Changchun University of Technology (Social Science Edition). 2012, 8:61-62+80.
- [9] Guo Hao, Ren Baoping. Changes in demographic dividend and changes in the mode of economic development in China [J]. Contemporary Finance and Economics. 2014, 3:5-13.
- [10] Li Xiaonan. Feasibility and Countermeasure Analysis of Comprehensive Opening-up of the Second Child Policy [J]. Public Management. 2016, 2:304.
- [11] Liu Chunyuan, Sun Li. "Population Dividend Theory": Four Misconceptions [J] Population Research. 2009, 1:81-91.
- [12] Lu Ren, Cai Fang. From Population Dividend to Reform Dividend: A Simulation Based on China's Potential Growth Rate [J]. World Economy. 2016, 1:3-23.
- [13] Mei Zhequn, Miao Qing. Interpretation of the "shortage of migrant workers" [J]. Human resources. 2008, 7:33-39.