

Research on the Influence of Regional Population Structure on Sustainable Economic Development

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Abstract: Population is one of the key factors affecting regional economic development. [1]A reasonable population structure will promote long-term sustainable growth of regional economy, which is crucial for the healthy development of regional economy and society. [2]Firstly, based on the theory of population economy, this article takes Tai'an City, Shandong Province, China, as an example, analyzes the population structure and economic development situation in detail, and summarizes the problems faced by the population structure. Secondly, from the aspects of population growth, population age structure, population cultural structure, and floating population, this paper expounds the impact on sustainable economic development. Finally, from improving the security mechanism for the elderly, improving the cultural structure of the population, optimizing the industrial layout, and strengthening the management of floating population, countermeasures and suggestions suitable for the long-term and healthy development of the regional economy are proposed [3-4].

Keywords: Population Structure, Economic Development Influence, Countermeasures and Suggestions

1. Research Background

In recent years, China's economy has developed rapidly, with a significant increase in population and economic aggregate, and the population structure in various regions has also presented a new normal. The population structure not only affects the change of the total population, but also affects the development of social economy [5-6]. To promote economic development, it is essential to find a suitable population structure and industrial structure for regional economic development. It is necessary for us to analyze the population structure and its impact on economic development.

As the central region of Shandong Province, Tai'an City of China is currently in the critical period of upgrading and transforming its industrial structure. Studying the relationship between the gender structure, age structure, quality structure of its population and economic development, as well as the impact mechanism of its population structure on economic development, 'it can provide reference for the government to formulate a reasonable population and fertility policies, thereby enabling the government to make reasonable planning for economic development from the perspective of population structure adjustment, which has certain guidance and practical significance.

2. Current Situation of Population Structure Development

2.1. Negative Population Growth

In the past decade, the permanent population of Tai'an City has maintained a low growth rate, with the permanent population of more than 5.6 million. However, since 2019, the population has started to experience negative growth. By the end of 2020, the permanent population accounted for 5.39% of the total population of the province, down 22000 or 0.4% compared to the end of 2010. It is the only prefecture level city in the province that has experienced negative growth in the past decade.

Compared with the sixth national population census in 2010, the three regions with more population growth are: Taishan District, Daiyue District and Tai'an High tech Zone. In general, among the permanent residents of Tai'an, the urban population has increased significantly, while the population of counties and cities has generally decreased. The population aggregation effect in the central urban area

is obvious, but the economic dividend has not been realized.

2.2. Overall Balanced Gender Ratio of the Population

The overall sex ratio in Tai'an City has not changed much. In 2020, among the permanent residents of Tai'an City, the female population will be 2.751 million, accounting for 50.28%; the male population is 2.72 million, accounting for 49.72%. The female population is more than the male population, which is diametrically opposite to the overall situation in China. The sex ratio of the total population decreased from 99.63 of the sixth national population census in 2010 to 98.87 (100 women, male to female), with no significant change.

2.3. The Prominent Trend of Population Aging

According to the latest census data, the population aged 15-59 was 3.314 million, accounting for 60.57%, 9.17 percentage points lower than that of the sixth census; The population aged 60 and above was 1.207 million, accounting for 22.06%, an increase of 7.40 percentage points over the sixth census, of which the population aged 65 and above was 854000, accounting for 15.62%, an increase of 6.04 percentage points. It can be seen that with the opening of the family planning policy, the proportion of young people has increased, but the problem of population aging is still prominent.

2.4. Significant Improvement in Cultural Quality

According to the census data, the education level of primary schools will account for 22.8% of the permanent residents in 2020, High school education accounted for 13.5%, College degree and above accounted for 13.1%, 39% of them have junior high school education. According to the data, 13107 out of every 100000 people have college education, an increase of 4780 compared to the previous statistics. There were 13559 people with high school education, an increase of 444 compared to the previous statistics. 39022 people had a junior high school education and 22852 had a primary school education, a decrease of 1612 compared to the previous statistics. At the same time, the average number of years of education for the population aged 15 and above will increase to 9.58 years in 2020. It can be seen that the cultural quality education level of the population in this city has been significantly improved.

2.5. Gradually Shrinking Population and Family Size

Compared with the sixth census, the number of households in Tai'an City increased by 148000 in the seventh census, an increase of 8%; Among them, the household population is 5003500, accounting for 91.43%. The average family size is 2.71, 0.33 fewer than that in 2010. The scale of households is becoming smaller and smaller, which reflects the influence of social, economic and cultural aspects of Tai'an City in recent years, such as the continuous relaxation of urban settlement policy, the increase of floating population, the gradual improvement of the housing security system and other factors, especially the trend of young people to buy houses and start a family in big cities, and the corresponding change of family concept. At the same time, China's long-term family planning policy has led to the decline of the fertility rate, which is also one of the main reasons for the decline in household size. In addition, the number of "divorced families, DINK families, late childbearing families, old people living alone and young people living alone" is increasing year by year, which is also one of the reasons for the reduction of family size. With the economic development and the reform of the housing system, more people can own their own houses and do not have to be crowded under one roof, which is inseparable from the process of modernization and urbanization in China [7].

2.6. Significant Impact on Floating Population

The rapid development of regional economy has led to more and more frequent population movements in cities. [8]According to the latest census data, among the permanent residents of Tai'an City, the separated population increased by 128.76% compared with the sixth national census in 2010, of which the separated population in the municipal area increased by 145.10% and the floating population increased by 105.3%. These data fully show that under the continuous influence of economic and industrial restructuring, the reform of the registered residence system and rural migrant labor, the scale of the floating population is increasing significantly.

3. Current Situation of Economic Development

3.1. Economic Growth

Tai'an City is located in the middle of Shandong Province, China. It is the location of Mount Taishan, a famous tourist attraction. As shown in Figure 1, in 2020, Tai'an City achieved a GDP of 276.65 billion yuan, accounting for 3.78% of the total GDP of Shandong Province, an increase of 10.291 billion yuan over the previous year, or 3.86%. The per capita GDP was 50600 yuan, an increase of 3300 yuan or 6.98% over the previous year; in 2020, Tai'an's GDP per capita ranked 12th in the province, lower than the national average (72400 yuan). In the past decade, GDP and GDP per capita have shown a steady upward trend, but still develop slowly.

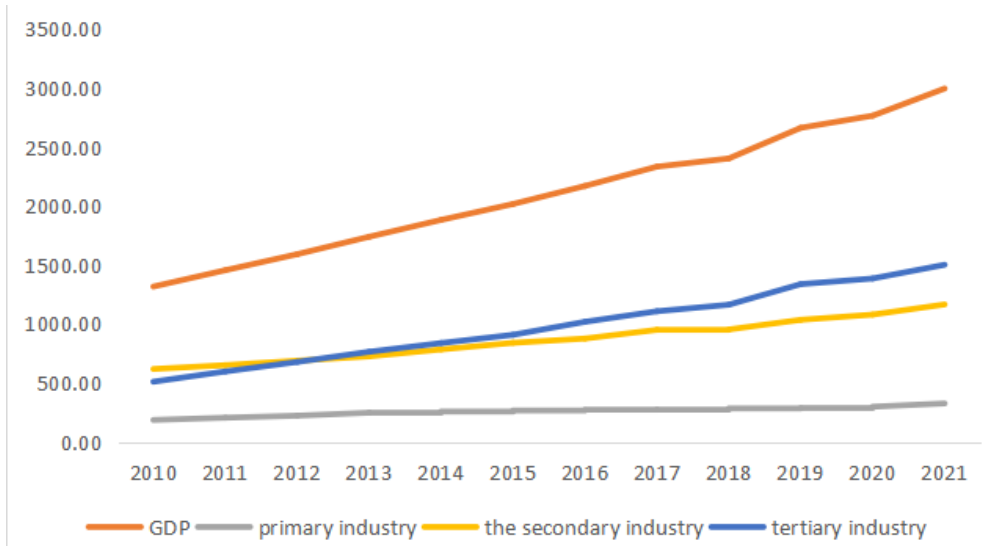


Figure 1: Tai'an GDP from 2010 to 2020.

3.2. Industrial Structure

The industrial structure of it has been continuously optimized. As shown in Figure 2, the scale of the gross domestic product of the primary industry has been relatively stable and its proportion has been decreasing from 14.21 in 2010 to 10.93. The gross domestic product (GDP) of the secondary and tertiary industries is continuously increasing, and the industrial structure is also constantly adjusting. Since 2012, the tertiary industry has surpassed the secondary industry and become the second pillar industry of Tai'an City. The proportion of the secondary industry has shown a continuous downward trend, with the proportion of the three industrial structure adjustments being 10.93, 38.93, and 50.15, respectively.

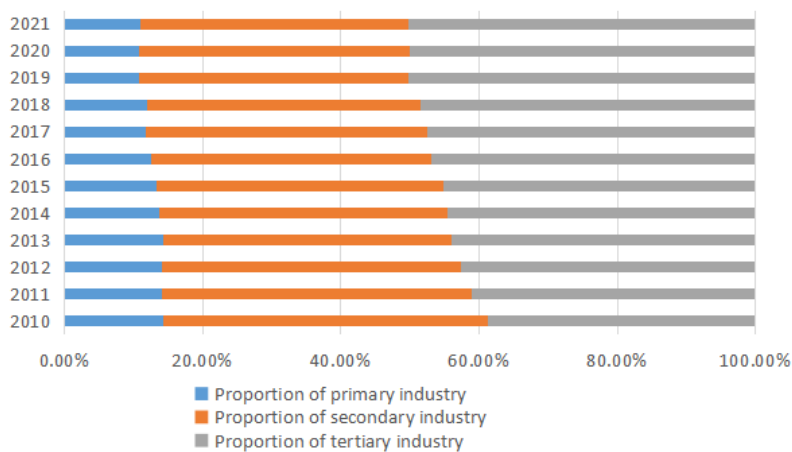


Figure 2: Proportion of Three Industries in Tai'an City from 2010 to 2021.

4. The Influence of Population Structure on Economic Development

4.1. The Influence of Population Growth

During the period from 2010 to 2020, the total GDP of Tai'an City increased from 131.8 billion yuan to 276.65 billion yuan, ranking 12th among the 16 cities in Shandong Province of China, an increase of 3.5% compared to last year. However, Tai'an has a large population, which is both an advantage and a disadvantage. The total population of Tai'an City is 5.472 million, accounting for 5.39% of the total population of Shandong Province, ranking 9th in Shandong Province. According to the knowledge of population economy theory, population growth contributes to the formation of economies of scale, promoting the division of labor and technological progress, and plays an important role in promoting economic development under relatively abundant resources. [9] In 2010, the total retail sales of social consumer goods in Tai'an City was 69.78 billion yuan, accounting for 5.8% of the total retail sales of social consumer goods in the province. In 2020, the total retail sales of social consumer goods in the province reached 2.92 trillion yuan, and the total retail sales of social consumer goods in Tai'an City was 102.24 billion yuan, accounting for 3.5%. Although the proportion decreased, total retail sales of consumer goods in Tai'an City increased by 46.5% in the past decade. At the same time, the increase in population has led to increased environmental pollution, an aging population, and a shortage of education funds. This puts forward higher requirements for the urban infrastructure, employment, education and the social security system, which must constantly improve economic benefits.

4.2. The Influence of Population Age Structure

The age structure of the population is one of the important indicators reflecting the population situation of a region, and also an important content of population economics, which will have an important impact on consumption, education, labor supply and demand.

(1) The influence of population age structure on consumption level

The sixth and seventh population censuses of Tai'an City show that the proportion of children and adolescents has increased, the proportion of young and middle-aged people has declined, and the aging trend has intensified. From the perspective of consumption, changes in the age structure of the population will gradually change the social consumption structure, and the consumption level will also change. On the one hand, because the labor force demographic dividend still exists, there is still a large proportion of household income used for consumption expenditure. [10] On the other hand, with the social progress and the change of consumption concept, the structure of living consumption has changed. The Engel coefficient has decreased in the household expenditure coefficient, and people's living and entertainment, tourism expenditure, housing expenditure, especially children's education expenditure has increased significantly. In 2020, the per capita consumption expenditure is 18601 yuan, an increase of 499 yuan or 2.8% year on year, of which food expenditure is 4756 yuan, accounting for the largest proportion, and education, culture and entertainment expenditure is 2380 yuan, The year-on-year growth rate was 4.8%, which was also the fastest growing category among the eight categories of consumer spending. In 2020, the Engel coefficient of urban residents will be 24.2%, 7.4 percentage points lower than that in 2010.

(2) The Influence of Population Age Structure on Education

With the continuous updating of educational concepts, parents pay more attention to the education of school-age children. According to the data of the seventh census, the proportion of people aged 0-14 has increased by 1.8 percentage points, which puts forward higher requirements for the quantity and quality of education in Tai'an City, not only referring to the requirements for hardware related supporting facilities such as school environment, but also the requirements for teachers' education level, school learning atmosphere and other software supporting facilities.

(3) The Influence of population age structure on labor supply and demand

The aging population will directly change the scale of labor supply and demand in the region. For Tai'an City, the main performance is: first, reducing the scale of labor supply. Second, further reduce the labor participation rate. Third, after the level of aging has increased, the labor supply time of the elderly population has decreased, and the total labor supply time has significantly decreased. At the same time, the aging will increase the demand for posts in the elderly care service industry in Tai'an City. With the increase of the elderly population, a large number of medical, health services and other

professionals or industry personnel are needed; we will expand the demand for jobs in the upstream and downstream industrial chains of elderly care services, and drive the demand for jobs in related industries.

4.3. The Influence of Population Cultural Structure on Economic Development

The conclusion of the study is that the proportion of high-quality workers has a significant positive relationship with economic development, and empirical analysis shows that the proportion of high-quality workers has a significant promoting effect on the economy. [11] That is, when the proportion of high-quality labor population increases by 1%, the gross social product will increase by 0.600678%. According to the data of the seventh census, the proportion of Tai'an's population with the college education or above per 100000 people accounted for 13.1%, 3.7 percentage points higher than that in 2010, High school (technical secondary school) with education level accounted for 13.6%, 0.4 percentage points higher than that in 2010. The proportion of junior middle school and primary school students with education level has decreased, and the overall education level has been significantly improved, which has a significant role in promoting the economy. However, the study found that the proportion of the population with low education levels in Tai'an City is still relatively high, with the highest proportion of the population with a junior high school education level, close to 40%. The proportion of the population with primary, high school, and college or higher education levels is relatively small, accounting for 13%. Therefore, the average number of years of education of the population in Tai'an City has grown slowly. From 2010 to 2020, the average length of schooling has only increased by 0.66 years, and the population education structure still needs to be optimized. The population quality of Tai'an City is still low, which will hinder technological progress and innovation to a certain extent.

4.4. The Impact of Floating Population on Economic Development

The floating population has accelerated the urbanization process. In the comprehensive evaluation of economic and social development of the province in 2018, the urbanization rate of Tai'an population ranks sixth in the province, the permanent population rate is 61.87%, and the urbanization rate of registered residence population is 52.13%.

In the process of transfer, the floating population not only transfers the labor force, but also brings about the flow of capital, which drives the development of the local economy. [12] The transfer of rural floating population to cities to engage in work related to the secondary and tertiary industries objectively meets the demand of labor force for the development of the secondary and tertiary industries, and promotes the rational allocation of labor resources in Tai'an City. With a large outflow of young and middle-aged rural labor, and an increase in the proportion of left-behind children and the elderly, the phenomenon of rural arable land becoming barren is very common. The scarcity of rural labor forces has led to large areas of land being left uncultivated, posing serious challenges to the fundamental position of agriculture in the national economy.

5. Countermeasures and Suggestions

To optimize the population structure and promote its sustainable economic development, the following countermeasures and suggestions are proposed:

(1) Improve the elderly population security mechanism and develop the elderly service industry

First, cultivate, support and introduce specialized institutions, provide diverse and multi-level elderly care services for communities and the elderly at home, and improve the construction of elderly care facilities. [13] The second is to enable urban and rural residents to be covered by the endowment insurance system, and steadily establish a long-term care insurance system. Third, establish a smart elderly care service platform in the home community, connect the street and "property elderly care" service information and service resources, and form an integrated care network based on the community; Fourth, strengthen the construction of the professional team of elderly care services, support and guide universities to open elderly care related majors, and cultivate a large number of medical and nursing related professionals.

(2) Balanced investment in educational resources and improvement of the cultural structure of the population

Further improve the rational allocation of educational resources in Tai'an City, strengthen the guidance of rural teacher education with policies, and narrow the differences between urban and rural education levels. For some schools that fail to meet the basic conditions for running a school, are small in scale, and have poor education quality, integrate educational resources, and reasonably allocate resources through joint running, cooperative running, and entrusted training without affecting the quality of education. At present, the brain drain in Tai'an City is relatively serious. Financial support is given to key universities to cultivate innovative high-tech talents, and at the same time, a favorable talent introduction policy is formulated to actively introduce talents from all walks of life.

(3) Optimize industrial layout and transform growth momentum

Further optimize the industrial layout, mobilize production enthusiasm, effectively guide personnel flow, and make the population structure and industrial structure more reasonable. [14] The scale of population mobility in Tai'an City is large. A large number of rural labor force flows to cities and economically developed areas, which is not conducive to the upgrading of the industrial structure of Tai'an City. Especially in recent years, affected by the epidemic, the tourism industry has suffered a heavy blow, leading to a large number of population outflows. The way that students go out to study and find jobs in other places has led to the outflow of population in Tai'an City. Therefore, our city should provide employment information services through various channels of the government and the private sector, optimize the industrial structure, vigorously develop the service industry and modern agriculture, and optimize the population structure.

(4) Improve the management mechanism of the floating population

Further improve the registration of floating population information, strengthen the information sharing between government functional departments and regions, and achieve real-time monitoring of the floating population in Tai'an City. We should establish a security system for the floating population, ensure that their accompanying children receive equal and compulsory education, improve public services such as basic old-age care, medical care, health care and housing security, and increase employment opportunities for the floating population. The use of policies to support migrant workers to return home and start businesses is conducive to the construction of new countryside and the promotion of regional economic development [15].

(5) Reduce the cost of childbearing, nurturing and education, and promote the long-term balanced development of the population

First, we should gradually improve the maternity insurance and maternity leave system, strictly implement maternity leave, breastfeeding leave and other measures to reduce the burden of childbearing of residents; Second, we should implement tax, housing, incentives and other support policies to reduce the burden of raising residents; Third, we will increase the coverage of inclusive kindergartens, improve the funding guarantee mechanism for urban and rural compulsory education, and reduce the education burden of residents.

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