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Research on the Changes, Impacts and Countermeasure Suggestions of Gansu Province's Population Age Structure

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Abstract

Based on Gansu Province's statistical data from 2010 to 2024, this study analyzes the evolutionary characteristics of the province's population age structure and its social-economic impacts. The research shows that Gansu Province has fully transitioned from the "demographic dividend period" to the initial stage of "deep aging". The core characteristics are as follows: first, the proportion of working-age population (15-64 years old) has dropped significantly to 68.43%, and the population dependency burden has rebounded rapidly from its historical low; second, regional differentiation has intensified, presenting a dual structure of "deep aging in core industrial cities" (such as Lanzhou and Jinchang) and "relative youthfulness in ethnic minority areas" (such as Linxia and Gannan). The profound changes in the population structure, on the one hand, have restrained the overall economic and financial development level of the province by weakening the foundation of labor supply, and on the other hand, have led to a decline in the resident savings rate in areas with a high degree of aging; the superposition of these two effects has jointly exacerbated the differences in regional development and urban-rural patterns within the province. To address these issues, this paper proposes a strategic orientation of "replacing quantity dividend with quality dividend", and suggests constructing a cross-regional coordination mechanism between population and industry, and deeply tapping the domestic demand potential of the "silver economy" to cope with the structural challenges in the era of negative population growth.

Keywords

Gansu Province; Population Age Structure; Aging; Low Fertility Rate; Regional Differences.

1. Introduction

As a core dimension of population development, the changing trend of population age structure profoundly affects labor supply, social security burden, economic growth momentum and the efficiency of public resource allocation. Against the background of accelerating global population aging, China has experienced frequent adjustments to fertility policies since 2011, from the "selective two-child policy" to the "universal two-child policy", and then to the successive implementation of the "three-child policy". This series of policy changes, coupled with the multiple effects of economic and social transformation, have exerted a far-reaching impact on the population structure of various provinces[2]. As a typical western province, Gansu is not only facing the common pressure of population outflow in inland areas, but also presents distinct population evolution characteristics due to the concentration of ethnic minorities, internal development differences and unique resource and environmental conditions. In this context, the changes in Gansu's population age structure not only reflect the common national laws, but also carry the unique regional marks, which have important theoretical value and practical significance for the research.

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At the theoretical level, the impact of population age structure changes on economic and social development has always been the core focus of academic circles. Domestic and foreign studies have generally confirmed that the process of aging and low fertility rate will reshape the regional development pattern through paths such as labor supply, savings rate and public expenditure (Zhang Xiao qing, 2009; Wang Ping, 2016). Specifically for western China, scholars such as Wei Shu qing (2016) have emphasized the importance of regional differences. In the research on Gansu Province, existing literatures mostly focus on the macro description of the aging trend (Yuan Feng xiang, 2021) or its impact on a single field such as economic financialization (Zhao Yongwei, 2022).

2. Analysis of the Changing Characteristics of Gansu Province's Population Age Structure

2.1. Overall Changing Trend of Population Age Structure

From 2010 to 2024, the year-end resident population of Gansu Province showed an overall downward trend. Although there were slight fluctuations during the period, the population finally decreased from 25.5998 million in 2010 to 24.5834 million in 2024, a cumulative decrease of about 1.0164 million over 14 years.

For specific age groups, from 2010 to 2024, the proportion of the 0-14 age group in Gansu Province showed a relatively stable fluctuating trend, with the overall value ranging between 17.42% and 18.16%. Despite minor fluctuations during the period, the proportion of this age group did not show significant growth or decline, and remained at a low level. This indicates that the scale of the child population has remained basically stable, and its impact on the long-term population structure is relatively limited.

The proportion of the 15-64 age group experienced a gradual decline. In 2010, this proportion was as high as 73.61%, reflecting the abundant labor resources at that time. However, around 2014, this proportion entered a continuous downward channel. As can be seen from the figure, the proportion dropped from the peak to about 68.43% in 2024.

The proportion of the population aged 65 and above showed an obvious upward trend from 2010 to 2024, steadily increasing from the initial 8.23% to 13.63%. This change indicates that the process of population aging in Gansu Province is accelerating, and the proportion of the elderly population is expanding year by year. According to the international general standard, when the proportion of the population aged 65 and above in a country or region exceeds 7%, it enters an aging society. This marks that Gansu has stepped into an aging social structure, and the age structure has completed a fundamental transformation from "adult type" to "elderly type", showing a significant trend of continuous aging.

2.2. Indicators of Working-Age Population

The changes in the working-age population of Gansu Province show significant phased characteristics. The working-age population (15-64 years old) in Gansu Province has experienced a process from slow decline to accelerated reduction. The total number of working-age population fluctuated from 18.8260 million in 2010 to 16.8223 million in 2024, a decrease of 10.6%. At the same time, the proportion of working-age population in the total population dropped from 73.61% in 2010 to 68.43% in 2024, a decrease of 5.18 percentage points, marking the gradual disappearance of the "demographic dividend".

This change has a dual impact on labor supply. On the one hand, the reduction in the total labor supply has alleviated the total employment pressure to a certain extent. The results of the seventh national population census show that the proportion of the 15-59 age group in Gansu Province decreased by 5.83 percentage points compared with 2010, with a total decrease of 1.8450 million.

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2.3. Dependency Ratio Indicators

2.3.1. Total Dependency Ratio

From 2010 to 2024, the total dependency ratio of Gansu Province showed a trend of "first decreasing, then increasing, and stabilizing at a high level". It was 35.85% in 2011, and after a short slight decrease, it entered a continuous upward channel since 2015, reaching a peak of 47.5% in 2021. This indicates that the overall social dependency burden has increased significantly by about 12 percentage points over ten years. Although it has slightly declined after 2024, it still remains at a high level of more than 46%[3]. This change reveals that Gansu Province has crossed the "window of opportunity" with a relatively light population burden and entered a stage of high dependency burden, and the pressure on social resource allocation continues to expand.

2.3.2. Child Dependency Ratio

The change of child dependency ratio shows obvious "policy-driven fluctuation" characteristics. From 2010 to 2018, this ratio fluctuated slightly around 24%, relatively stable. Starting from 2019, affected by factors such as the release of the cumulative effect of the "universal two-child policy", the child dependency ratio increased significantly, reaching a phased high of 28% in 2020. However, this upward trend could not be sustained, and it entered a downward channel after 2020. This "peak and then decline" pattern clearly indicates that although short-term fertility encouragement policies can temporarily boost the birth level, they cannot fundamentally reverse the long-term low fertility rate trend constrained by factors such as economic pressure, child-rearing costs and women's career development.

2.3.3. Elderly Dependency Ratio

The elderly dependency ratio shows a rigid growth characteristic and is the core driving force for the rise of the total dependency ratio. Starting from 11.18% in 2010, this ratio has steadily increased with an almost monotonically rising curve, reaching 19.92% in 2024, an increase of nearly double. This continuous and accelerated growth trend directly reflects the depth and speed of the population aging process in Gansu Province. It means that the economic burden of social pension continues to double, posing a direct and growing pressure on the payment capacity of the endowment insurance system, the long-term operation of the medical and health service system, and the sustainability of public finance.

2.4. Characteristics of Regional Differences

Due to differences in economic development level, urbanization process, ethnic composition and population mobility, the 14 cities (prefectures) in Gansu Province have significant regional differences in population age structure[4]. The differences are mainly reflected in two aspects: the degree of aging and the proportion of the child population.

2.4.1. Degree of Aging

The aging rate of all cities and prefectures in Gansu Province showed an overall upward trend from 2010 to 2024, with obvious regional differences. According to the 2024 data, Lanzhou City, Jinchang City and Baiyin City are the regions with the highest degree of aging in the province, with the proportion of the population aged 65 and above exceeding 15%, among which Lanzhou City is as high as 16.8%. These regions have relatively high economic development levels, good medical conditions and long average life expectancy. On the contrary, Linxia Hui Autonomous Prefecture and Gannan Tibetan Autonomous Prefecture are the "youngest" regions in the province. Due to the relatively loose fertility policies and strong traditional fertility concepts in these two ethnic autonomous prefectures, the birth rate is relatively high, thus maintaining a relatively young population structure. The aging level of Gannan Prefecture has just exceeded the threshold standard of an international aging society.

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2.4.2. Proportion of the Child Population

Linxia Prefecture and Gannan Prefecture also rank among the top in the proportion of the child population, showing strong population growth potential. In contrast, cities and prefectures with severe aging, such as Lanzhou City and Jinchang City, have a relatively low proportion of the child population. This pattern of "high child proportion - low aging" and "low child proportion - high aging" has formed the spatial duality of Gansu Province's population age structure.

3. Impacts of Population Age Structure Changes

3.1. Impact of Population Age Structure Changes on Residents' Savings Rate

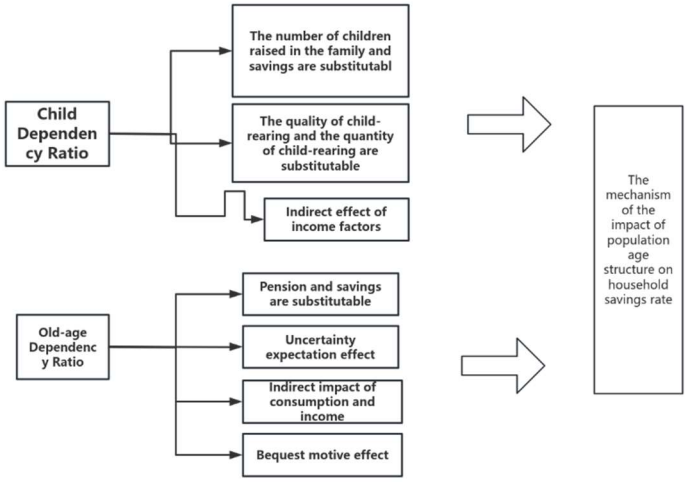

Figure 1. Mechanism of Population Age Structure on Residents' Savings Rate

Child Dependency Effect (Substitution Effect): From 2010 to 2024, a high child dependency ratio means that families have to allocate a large amount of disposable income to their children's education and medical care, forming a "crowding-out" effect on savings.

Elderly Dependency Effect (Consumption Effect): After 2020, the elderly dependency ratio has accelerated to rise to nearly 20%. In areas with high aging such as Lanzhou and Jinchang, the elderly population has entered a pure consumption stage and used savings to maintain their lives, leading to a downward trend in the regional savings rate. In contrast, in areas with low aging such as Linxia and Gannan, the savings rate is less affected by this, showing significant regional differences[5].

3.2. Impact on the Differentiation of Regional Development and Urban-Rural Patterns

The significant differences in the degree of population aging among cities and prefectures in Gansu Province have exacerbated the imbalance of regional development. According to the 2024 data, the difference between the region with the highest aging degree (such as Lanzhou City) and the region with the lowest (such as Gannan Prefecture) exceeds 10 percentage points. This regional difference makes different regions face distinct development challenges. Regions with a high degree of aging, such as Lanzhou and Jin chang, are under great pressure of social security and face rapid rises in labor costs; while regions with a low degree of aging, such as Lin xia and Gan nan, have relatively abundant labor forces, but their economic development levels are low and the development of human resources is insufficient.

The problem of rural "empty-nest phenomenon" has become increasingly prominent. With the acceleration of urbanization, young and middle-aged labor forces in Gansu Province have

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continued to migrate to cities, and the aging speed of the rural resident population is significantly faster than that of cities. The rural "empty-nest phenomenon" caused by population outflow has led to the breakdown of the intergenerational support chain of the family pension function.

4. Countermeasure Suggestions

4.1. Implementing the Strategy of Human Capital Enhancement to Replace Quantity Dividend with Quality Dividend

Faced with the decline in the proportion of the 15-64 working-age population, the traditional "demographic dividend" model is no longer sustainable. Therefore, the policy focus should be shifted to improving the quality of existing and future labor forces, and the policy emphasis should be transformed from relying on "population quantity" to enhancing "human capital quality". We should thoroughly implement the "Opinions on Promoting the Development of Vocational Education in the Whole Province to Build 'Skilled Gansu'", and take the in-depth integration of vocational education and regional industries as the key path to enhance human capital. Centering on the development needs of Gansu's advantageous industries such as new energy, new materials and equipment manufacturing, as well as key industrial chains, we should explore a talent training model of "school-enterprise cooperation and work-study integration"[6]. Encourage leading enterprises to co-build training platforms and develop courses with vocational colleges, so that what students learn is closely aligned with the needs of jobs. Thus, it can provide stable and high-quality skilled talents for the industrial transformation and upgrading of Gansu.

4.2. Developing the Silver Economy to Tap the Consumption Potential of the Elderly Population

In response to the deepening aging degree of Gansu Province (the proportion of the population aged 65 and above has reached 13.63%) and the continuous rise of the elderly dependency ratio (nearly 20%), developing the silver economy is not only a necessary measure to cope with the pension pressure, but also an important path to stimulate domestic demand potential and promote industrial transformation. According to the "Opinions of the General Office of the State Council on Developing the Silver Economy to Improve the Well-being of the Elderly", Gansu Province should fully tap the consumption potential of the elderly population:

Developing Characteristic Silver Products For active elderly people inside and outside the province, develop "migratory" elderly tourism and pension products, and build the "Gansu Health Care" brand. [1] Encourage enterprises to carry out precise innovation for the needs of the elderly, and develop "silver caring packages" that are easy to digest and nutritionally balanced (preliminary practices such as 'silver caring packages' have emerged in the province, which have the foundation for further promotion).

Expanding Intelligent and Financial Silver Consumption Scenarios Support enterprises to develop intelligent health monitoring equipment suitable for the elderly (for example, Linze County and Gangu County have taken the lead in establishing a smart elderly care model integrating intelligent equipment, cloud platforms and offline services under government leadership), so as to improve the safety and convenience of elderly care services. Guide financial institutions to innovate and launch pension wealth management, trust and commercial endowment insurance products with moderate thresholds, stable returns and low risks (for example, Bank of Gansu has systematically built the "Gan Yang Le" pension financial brand) to help the elderly activate their asset stock and enhance their sustainable consumption capacity[8].

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4.3. Implementing Differentiated Regional Policies to Promote the Coordinated Development of Population and Industry

There is a significant dual population structure in Gansu Province: the aging rate of industrial cities such as Lanzhou and Jinchang has exceeded 15%, while ethnic minority areas such as Linxia and Gannan still maintain a young structure.

Core Cities: Focusing on "Strengthening the Provincial Capital" and Talent RetentionFor regions with a high degree of aging but a good industrial foundation such as Lanzhou and Baiyin, the key countermeasure is to shift from relying on population scale to improving the output efficiency of unit labor and attracting high-quality external human capital. Thoroughly implement the "Gansu Province's Action Plan for Strengthening the Provincial Capital", accelerate the digital and intelligent transformation of traditional industries, and reduce the dependence on intensive labor. At the same time, optimize the threshold for talent settlement, provide "hard measures" such as talent apartments and housing subsidies, refine the incentives for graduates of local universities such as Lanzhou University and Northwest Normal University to stay in Gansu, transform the province's high-quality higher education resources into a stable talent supply, and build the "preferred destination" for graduates of local universities in the province.

Ethnic Minority Areas: Implementing the "Foundation Building and Transformation" Strategy Transform the advantage of population quantity into a long-term human capital advantage. Ethnic minority areas represented by Linxia Prefecture (child proportion 27.4%, aging rate 9.3%) and Gannan Prefecture have a significant young population structure and growth potential, but insufficient human capital accumulation. The core of the countermeasure is to invest in people, transforming the current "window of opportunity" of population quantity into a sustainable "quality dividend" supporting future development[7]. Relying on the "14th Five-Year Plan for the Cause of Ethnic Unity and Progress in Gansu Province", prioritize the allocation of public resources to basic education and secondary vocational education. Continuously deepen mechanisms such as "paired assistance", and guide the orderly transfer of surplus young and middle-aged labor forces in Gannan and Linxia to cities with strong industrial employment demand in the province (such as Lanzhou and Baiyin). Realize the spatial optimal allocation and efficiency improvement of the "provincial demographic dividend", alleviate the labor shortage pressure in core cities, and promote coordinated regional development.

5. Conclusion

Gansu Province has entered the initial stage of deep aging, with the working-age population proportion declining, the dependency burden increasing, and prominent regional dual structure characteristics. These changes have exerted profound impacts on the province's economic development, residents' savings behavior, and regional and urban-rural coordinated development. To address these challenges, it is necessary to adhere to the strategic orientation of "replacing quantity dividend with quality dividend", focus on improving human capital quality through vocational education integration, tap the consumption potential of the elderly population by developing the silver economy, and narrow regional development gaps through differentiated regional policies. Only by adapting to the new changes in the population age structure and promoting the coordinated development of population, industry and regions can Gansu Province achieve high-quality development in the era of negative population growth.

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