

The Impact of Changes in Population Structure on the Economic Development in China and the US

Yiru Wang^{1,a,*}

¹College of management, Shanghai University of Engineering Science, Shanghai, China
a. 031421219@sues.edu.cn

**corresponding author*

Abstract: China and the United States are both undergoing notable shifts in their population dynamics, marked by longer life expectancy and fewer births. This shift is resulting in population aging, with a growing proportion of elderly people compared to younger generations. Studying the impact of population changes on economic development offers valuable guidance for policymakers in China and the US. The research will utilize statistical analysis, data collection, literature review, and comparative case studies as its methodologies. And it informs effective policies in healthcare, education, retirement, and workforce planning. Both China and the United States are witnessing demographic changes marked by aging populations, impacting labor force participation, healthcare expenses, and social security outlays. And both nations confront challenges in maintaining skilled workforces and have implemented policies like fertility incentives, immigration reform, and education investments to address these issues. However, the impacts of demographic changes vary significantly between the two countries. This is due to differences in government policies and culture, such as immigration and fertility policies. Therefore, each country needs to address issues based on the actual changes in its population structure. By leveraging mutual learning and implementing tailored policies, both China and the United States can adeptly navigate demographic shifts, fostering sustainable growth and prosperity.

Keywords: Aging population, Economics, Policy

1. Introduction

Although population aging is not a new trend, the expected rise in the average age of the population is poised to bring about more significant economic impacts than seen before [1]. Both China and the United States are experiencing significant changes in their population structures, characterized by increasing life expectancy and declining birth rates. This demographic transition is leading to population aging, where the percentage of the population composed of older adults is rising relative to younger cohorts. Population aging has implications for the labor force composition and dynamics in China and the US. As the proportion of elderly individuals grows, there may be a shrinking working-age population, which can affect labor supply, productivity, and economic output. Population aging also places pressure on healthcare systems and social security programs in both China and the US. There is a growing demand for healthcare services, long-term care, and retirement benefits as the elderly population expands. Understanding how changes in population structure affect economic development can provide valuable insights for policymakers in both China and the US.

This research can help in formulating effective policies related to healthcare, education, retirement, and workforce planning. For example, demographic changes can impact social welfare systems, healthcare services, and pension schemes. By examining how demographics influence economic growth, researchers can contribute to the design of sustainable social welfare programs that cater to the needs of changing populations.

A comparative study between China and the US can offer a broader perspective on how different demographic trends influence economic outcomes in diverse socio-economic contexts. This comparative analysis can lead to a better understanding of global economic dynamics. Additionally, changes in population structure can create new investment opportunities and challenges. Research in this area can help investors and businesses anticipate future trends and make informed decisions regarding market strategies and resource allocation. In conclusion, investigating the impact of changes in population structure on economic development in China and the US is crucial for informing policy decisions, understanding economic dynamics, and promoting sustainable development in both countries.

The methods that will be used in the research contain statistical analysis. First, this research gathered and analyzed population data from China and the United States, including indicators such as age structure, population growth rate, fertility rate, mortality rate, etc. By comparing population data from different periods and regions, trends in population structure changes can be revealed. Then the economic data from China and the United States are collected as well, including indicators such as Gross Domestic Product (GDP), employment rate, labor force participation rate, consumption patterns, etc. By comparing relevant data on population changes and economic development, the relationship between the two can be explored. Additionally, literature review is an important method, this research integrate existing research literature from domestic and international sources to understand the consequences of demographic shifts on economic progress. By synthesizing the findings and perspectives of previous studies, this review provides a theoretical framework and research direction for the study. Finally, comparative case studies are also crucial for the research. This study chose representative regions or cities as case studies to delve into and analyze how changes in population structure affect the economic development of those areas. By comparing case studies from various regions in both countries, the study can pinpoint variations in how changes in population structure affect the economy.

2. Analysis of the Changing Population Structure and its Impacts in China

2.1. Background and Trends of Population Structure Changes in China

Being the world's most populous nation, China underwent a monumental demographic shift over the last five decades, marked by profound changes in its population's age distribution, decreasing fertility rates, rapid acceleration of population aging, and an expanding population size [2]. From 1979 to 2015, China enforced a stringent one-child policy to manage the growth of the population. This policy aimed to curb the rapid population increase and alleviate the strain on resources. As a result, the fertility rate declined significantly, leading to a decline in the rate of population growth. Figure 1 shows birth rate of China in the past 10 years. According to United Nations population reports, China is projected to have a ratio of elderly dependents to the working-age population of 47.5% by 2050 [3]. One significant outcome of the one-child policy is the aging demographic trend observed in China. As the efficacy of the two-child policy fades and the repercussions of the COVID-19 pandemic ease, China is now experiencing a period marked by historically low levels of fertility rates, as revealed by the findings of the Seventh Census [2].

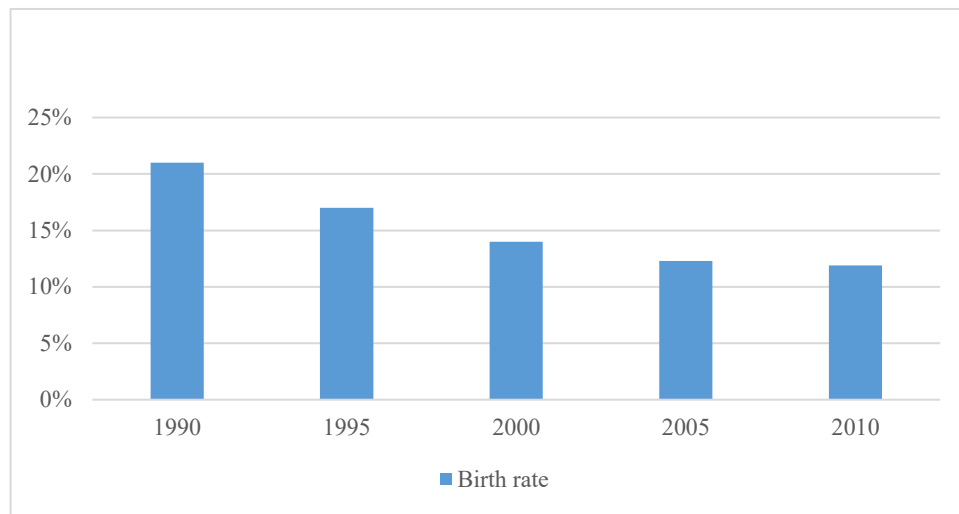


Figure 1: 1990-2010 birth rate of China [4]

This demographic shift poses challenges for the country's social security, healthcare, and labor market. The combination of the one-child policy and a cultural preference for male offspring resulted in a substantial gender imbalance in China. Cultural norms favoring male children led to the practice of sex-selective abortions and the abandonment of female infants. This has resulted in a surplus of males, particularly in rural areas, which has social implications and affects marriage patterns.

China has witnessed swift urbanization, with millions relocating from rural to urban areas in search of better job opportunities and living standards. This urbanization process has led to the growth of mega-cities and the emergence of a large urban middle class. The urban population now constitutes a significant proportion of China's total population.

China's population structure changes are not uniform across the country. There are significant regional disparities in terms of population density, economic development, and social indicators. The coastal regions, such as Guangdong and Shanghai, have experienced faster population growth and economic development compared to the inland provinces. Internal migration has played a crucial role in shaping China's population structure. Millions have transitioned from countryside to cityscape, fueling urban expansion and dwindling rural populations. However, the household registration system (hukou) has created barriers for migrants in accessing social services and benefits in their destination cities. Given the uncertain trajectory of future population structural shifts, it is essential to enhance dynamic assessments, make timely adaptations, and innovate in designing and managing population health strategies to safeguard quality of life amidst the backdrop of the aging of the population [2].

2.2. The Actual Impact of Population Structure Changes on Economic Development in China

One of the key effects of population structure changes is the demographic dividend. As China's working-age population (15-64 years) expanded relative to the dependent population (children and elderly), it created a favorable demographic window of opportunity for economic development. This demographic dividend provided a large and productive labor force, which played a significant role in driving China's rapid economic expansion in recent decades. The demographic dividend allowed China to benefit from a "demographic bonus" as the working-age population grew faster than the dependent population. This led to increased savings, investments, and productivity, which fueled economic expansion. The availability of a large labor force also attracted foreign direct investment and facilitated the growth of labor-intensive industries, such as manufacturing and exports.

However, as China's population structure continues to change, new challenges arise. One major concern is the aging population. Lower fertility rates alongside advancements in healthcare have contributed to extended life expectancy, consequently resulting in an increased share of elderly individuals among the population. This change in demographics presents challenges for economic development, as it puts pressure on the pension system, healthcare services, and social welfare programs. The aging population also has implications for the labor market. With a shrinking working-age population, there may be a shortage of skilled workers in certain sectors, which could hinder productivity and innovation. Additionally, the burden of supporting the elderly population falls on a smaller number of working individuals, potentially straining the social security system.

2.3. Policies and Measures of the Chinese Government in Response to Population Structure Changes

Following the easing of the One-Child Policy, the government implemented a Two-Child Policy to encourage couples to have more children and address demographic imbalances. The government has introduced various economic incentives to encourage couples to have more children, such as tax breaks, housing subsidies, and parental leave policies. Efforts have been made to address gender imbalances, particularly in rural areas where the preference for male children has led to skewed sex ratios. Initiatives include promoting gender equality in education, employment, and inheritance rights. The government has encouraged delayed retirement to mitigate the effects of an aging population. This includes policies to raise the retirement age gradually and incentivize older workers to remain in the workforce.

To address urban-rural disparities and encourage balanced development, the government has implemented policies to promote urbanization and improve infrastructure in rural areas. This includes measures to provide better access to education, healthcare, and employment opportunities in rural regions.

The government has expanded social security and healthcare coverage to provide better support for the elderly population. This includes pension reforms, healthcare subsidies, and long-term care services for seniors. With the increasing number of elderly citizens, the government has implemented policies to improve elderly care services, including the advancement of nursing facilities, home care programs, and caregiver education efforts. As an example, China is experimenting with various social insurance models for long-term care financing while simultaneously exploring the integration of healthcare and long-term care provisions in specific regions across the country [5]. The effectiveness and sustainability of these pilot initiatives remain to be seen [5].

3. Analysis of the Changing Population Structure and its Impacts in United States

3.1. Background and Trends of Population Structure Changes in the United States

Changes in the demographic profile of the United States have included an aging population, greater racial and ethnic diversity, and shifts in family structures. One of the most notable trends is the aging of the population. Fertility rates have fluctuated over the years but have generally been declining. Economic factors, cultural shifts, and access to contraception all influence fertility rates. Lower fertility rates can impact population growth and the dependency ratio (the ratio of dependents to the working-age population). Figure 2 shows the birth rate of US in the past 8 years. The baby boomer generation, born between 1946 and 1964, has been driving this trend as they reach retirement age. This aging population has implications for healthcare, social security, and the labor force.

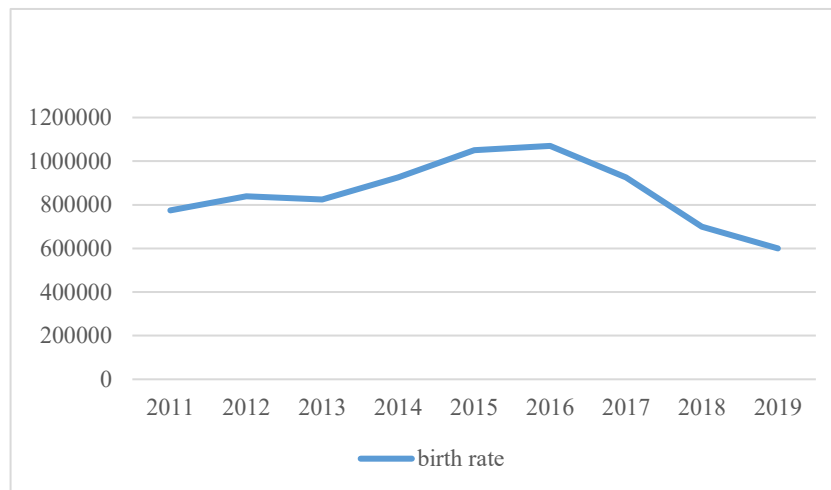


Figure 2: 2011-2019 birth rate of US [6]

The United States is becoming increasingly diverse. Non-Hispanic whites are projected to become a minority by mid-century, while the Hispanic, Asian, and Black populations are expected to grow. Immigration plays a significant role in this diversity, with immigrants contributing to population growth and cultural change.

There has been a steady trend of urbanization in the U.S., with more people living in urban areas than rural ones. This shift has implications for infrastructure, transportation, housing, and social services. Population trends vary across different regions of the United States. For example, some areas are experiencing rapid population growth due to factors like job opportunities and affordable housing, while others are facing population decline and aging populations.

Overall, mortality rates in the U.S. have declined over the past century due to advancements in healthcare, sanitation, and public health measures. However, there are disparities in mortality rates based on factors such as race, socioeconomic status, and geographic location.

3.2. The Actual Impact of Population Structure Changes on Economic Development in United States

Changes in the population structure, including an aging population and declining fertility rates, affect the composition of the labor force. Employees across various age brackets may serve as substitutes or complements to each other, affecting the productivity of different age groups through their interactions [1]. With an aging population, a reduced portion of the populace falls within the working-age bracket, potentially resulting in labor shortages within specific sectors and geographical areas. This can impact economic productivity and growth.

The aging population typically demands higher levels of healthcare services, placing pressure on healthcare systems and causing healthcare costs to rise. This can have implications for government budgets, as well as for businesses providing healthcare benefits to employees. The aging population also strains social security and pension systems, as a shrinking workforce supports an increasing number of retirees. Policymakers may need to reform these systems to ensure their sustainability in the face of demographic changes.

Population structure changes also influence the skill composition of the labor force. For example, the retirement of the baby boomer generation may lead to a loss of experienced workers in certain industries. At the same time, changes in immigration patterns can impact the availability of workers with specific skills and qualifications.

Demographic shifts, such as increasing racial and ethnic diversity and changes in family structure, affect consumer markets. Businesses must adjust their product offerings and marketing approaches to meet the diverse preferences and household compositions of consumers. This can create opportunities for businesses that can effectively target emerging demographic groups. Demographic changes can also impact innovation and entrepreneurship. For example, a younger population may be more inclined to start new businesses and adopt innovative technologies, driving economic growth. Likewise, heightened diversity has the potential to stimulate creativity and innovation by uniting individuals with varied perspectives and backgrounds.

Overall, population structure changes have complex and multifaceted impacts on economic development in the U.S. The ongoing trajectory of population aging and declining fertility rates, anticipated to persist in the coming decades, could lead to reduced output growth and real interest rates have been observed across OECD economies [7]. Policymakers, businesses, and communities need to understand these dynamics and adapt their strategies to effectively navigate the opportunities and challenges posed by demographic shifts.

3.3. Policies and Measures of American Government in Response to Population Structure Changes

As the population ages, the government adjusts Social Security policies to ensure financial stability for retirees. Changes may include raising the retirement age, adjusting benefits, or increasing contributions. Changes in population demographics, such as an aging population and shifts in healthcare needs, prompt the government to implement healthcare reforms. These reforms aim to improve access to healthcare services, control costs, and address the needs of specific demographic groups. The government implements workforce development initiatives to address changing population demographics, technological advancements, and shifts in labor market demands. These initiatives may include training programs, apprenticeships, and partnerships with employers to prepare workers for emerging industries.

The government adjusts immigration policies to respond to shifts in population demographics, labor market demands, and humanitarian considerations. Changes may include adjustments to visa programs, pathways to citizenship, and enforcement measures.

Demographic changes, such as urbanization and population growth, prompt adjustments to environmental policies to address resource management, pollution, and climate change. These policies may include regulations, incentives for sustainable practices, and investments in renewable energy.

4. Comparative Analysis

4.1. Comparing How Population Changes Affect Economic Development in China and the US

From a demographic standpoint, numerous advanced economies are grappling with the challenge of rapid aging, stemming from significant decreases in both birth and death rates [8]. China has experienced significant demographic shifts due to its one-child policy, which was relaxed in recent years. The population is aging rapidly, leading to a shrinking workforce and increased dependency ratio. The United States has a more stable population structure with a moderate birth rate and aging population. Immigration plays a significant role in maintaining workforce growth and offsetting the aging trend.

In terms of demographics, despite a large population, China faces challenges in maintaining a productive workforce due to an aging population and a decrease in the population of working-age individuals. The government has initiated policies to encourage increased participation of women and older individuals in the labor force. The US labor force is more diverse and adaptable, with a higher

participation rate. Immigration contributes to labor force growth and diversity, although there are debates over its long-term impact on wages and employment.

From the policy analysis, China has made significant strides in enhancing productivity through industrialization, technological advancements, and investments in infrastructure and education. However, productivity growth has slowed in recent years, partly due to demographic challenges. The Chinese government has implemented various policies to address demographic challenges, including incentives for couples to have more children, raising the retirement age, and promoting automation and technology adoption to offset labor shortages. The US economy benefits from a culture of innovation, entrepreneurship, and a highly skilled workforce. Investments in research and development, coupled with a dynamic business environment, contribute to sustained productivity growth. Government policies in the US focus on immigration reform, education and workforce development, and supporting innovation and entrepreneurship to maintain economic competitiveness and address demographic changes.

4.2. Analysis of Commonalities and Differences

Both China and the United States are experiencing demographic shifts characterized by aging populations. The process of demographic transition is reshaping the age distribution of emerging nations, resulting in substantial fluctuations between the working-age population and dependents [9]. This demographic trend has implications for labor force participation, healthcare costs, and social security expenditures in both countries. Both countries face challenges related to maintaining a productive and skilled workforce. As the population ages, there is pressure to increase labor force participation rates among older workers and to invest in education and training to ensure a skilled workforce. Regarding the influence of the impact of population demographics on economic growth in rapidly expanding populations, there is a generally adverse effect on agricultural GDP globally.

However, if the proportion of the working-age population surpasses 87%, this trend is reversed. Similarly, while there is a detrimental effect on global service GDP, this effect is mitigated if the elderly population share is less than 27% [10]. Governments in both China and the United States have implemented policies to address demographic challenges. These policies may include incentives for fertility, immigration reform, raising the retirement age, and investing in education and training programs.

On the other hand, there are many differences between these two countries. The age distribution of China's population has begun to impose constraints on its economic growth, while the United States has experienced a relatively minor impact from its population age distribution on economic growth [11]. Additionally, China's aging population has resulted in a discernible effect on per capita health expenditure, unlike the United States where no clear directional impact was observed [11]. While both countries are experiencing aging populations, China's population growth has slowed significantly due to its former one-child policy, whereas the United States has a relatively stable population growth rate, partly due to immigration. Immigration plays a more significant role in the United States compared to China in offsetting demographic challenges. The United States attracts immigrants who contribute to labor force growth and bring diverse skills and perspectives, whereas China has historically had more restrictive immigration policies.

The United States has a strong culture of innovation and entrepreneurship, which contributes to its productivity growth and economic dynamism. While China has made significant strides in technological advancement, it still faces challenges in fostering a culture of innovation and creativity comparable to that of the United States. The government structures and policy approaches in China and the United States also differ significantly. China operates under a centralized government with five-year plans guiding economic development, while the United States has a more decentralized system with policies influenced by federal, state, and local governments as well as market forces.

5. Conclusion

Both countries need to focus on up skilling and reskilling their workforce to adapt to changing demographics and technological advancements. Robust social safety nets are crucial to support aging populations and mitigate income inequality. This includes pension reforms, healthcare provisions, and affordable housing initiatives. Addressing gender imbalances is also essential for sustainable development. Policies promoting gender equality in education, employment, and social welfare can enhance productivity and social cohesion.

The U.S. should enact immigration policies that attract skilled workers and entrepreneurs while addressing concerns about job displacement and cultural integration. Both China and the U.S. need to invest in healthcare infrastructure and eldercare services to meet the needs of their aging populations. Governments should implement inclusive economic policies that prioritize equitable growth and address disparities across regions and demographic groups.

Changes in population structure have far-reaching implications for economic development. However, future population growth remains uncertain due to fluctuations in fertility, mortality, and migration trends, alongside numerous other influencing factors. By learning from each other's experiences and implementing targeted policies, both China and the United States can navigate demographic shifts more effectively and ensure sustainable growth and prosperity.

References

- [1] Maestas, N., Mullen, K.J., & Powell, D. (2023). *The Effect of Population Aging on Economic Growth, the Labor Force, and Productivity*. *American Economic Journal: Macroeconomics*, 15(2), 306-332.
- [2] Luo, Y., Su, B., & Zheng, X. (2021). *Trends and Challenges for Population and Health during Population Aging—China, 2015–2050*. *China CDC Weekly*, 3(28), 593.
- [3] Wang, Y., & Conesa, J.C. (2022). *The Role of Demographics and Migration for the Future of Economic Growth in China*. *European Economic Review*, 144, 104076.
- [4] National Bureau of Statistics of China, 2013, <https://www.google.com/publicdata/directory?hl=en&d|=en>
- [5] Feng, Z., Glinskaya, E., Chen, H., Gong, S., Qiu, Y., Xu, J., & Yip, W. (2020). *Long-term Care System for Older Adults in China: Policy Landscape, Challenges, and Future Prospects*. *The Lancet*, 396(10259), 1362-1372.
- [6] U.S. Census Bureau, 2020, <https://www.google.com/publicdata/directory?hl=en&d|=en>
- [7] Aksoy, Y., Basso, H. S., Smith, R. P., & Grasl, T. *Demographic Structure and Macroeconomic Trends*. *American Economic Journal: Macroeconomics* 11 (1), 193-222.
- [8] Ann, J., & Park, C. (2020). *Demographic Structure and House Prices in the United States: A Reconciliation Using Metropolitan Area Data*.
- [9] Ye, L., Zhang, X., & Geng, J. (2020). *Demographic Transition and Economic Growth: Evidence from China and United States*. *The International Journal of Health Planning and Management*, 35(1), e1-e11.
- [10] Gildas, N.T., paul, N., & Engwali, F. D. (2023). *Do Demographic Structure Conditions Sector Contribution to Economic Growth? A Machine Learning Approach*. *Environment, Development and Sustainability*, 1-41.
- [11] Kalafatçılar, M.K., & Özmen, M.U. (2021). *Demographic Transition and Inflation in Emerging Economies*. *Eastern European Economics*, 59(1), 51-69.