

Correlation between the Growth of the Chinese Aging Rate and Socioeconomic Factors

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ABSTRACT

This study examines the impact of various socioeconomic factors on population aging in China over the period 1978-2019. An ordinary least square regression model is utilized to analyze the relationship between aging rates and socioeconomic variables such as GDP, CPI, urbanization rate, unemployment rate, and family planning policy. The findings reveal positive correlations between GDP, CPI, urbanization rate, and family planning policy with China's aging rate. Consequently, effective strategies to address population aging should prioritize the quality of economic development through structural reforms, prudent fiscal and monetary policies, and bolstered support for social welfare programs. Targeted adjustments to current family planning policies are crucial in stimulating higher birth rates and supporting larger families. Moreover, refocusing development efforts on small and medium-sized cities and rural areas will help address the implications of rapid urbanization on the pace of aging. This study enhances the understanding of socioeconomic factors impacting the aging rate in China, offering valuable insights to policymakers in formulating more effective strategies. By considering the diverse socioeconomic aspects, policymakers can better prepare for and respond to the challenges presented by population aging.

Keywords: Aging, Socio-economic factors, China

INTRODUCTION

China's rapidly aging population has become a pressing concern for policymakers as it poses significant challenges to its socioeconomic development. According to World Bank data, China's population above the age of 65 increased from 4.1% in 2000 to 12.6% in 2020 (World Bank, 2018). This demographic shift is due to a combination of factors, including a decrease in the birth rate, an increase in life expectancy, and the one-child policy implemented in 1979 (Lee, 2020). Moreover, the problem has been exacerbated by the absence of a robust social security system for the elderly (Angeles, Guilkey, & Mroz, 2005; Niu, 2014).

As the aging population in China continues to rise, policymakers must design targeted measures that safeguard the well-being and quality of life of older individuals in China. Previous studies have shown that various socioeconomic factors, such as GDP, consumer price index (CPI), urbanization rate, and family planning policy, significantly influence the aging rate in China (Feng et al., 2020; Hsu, Yoshida, & Chen, 2022; Wu, Huang, & Pan, 2021). Therefore, this study aims to explore the effects of these variables on population aging and provide policymakers with evidence-based recommendations to mitigate the challenges posed by population aging in China.

This research holds substantial significance as it sheds light on the intricate correlations between China's aging rate and a multitude of socioeconomic factors. Through meticulous examination and quantitative analysis of the impact of these variables on aging rates, this study empowers policymakers with a profound comprehension of the mechanisms driving population aging. Armed with these profound insights, policymakers can craft targeted strategies to effectively tackle the challenges posed by population aging. The profound implications of this research are directed toward the development and implementation of policies that prioritize the well-being of older individuals and ensure a sustainable and prosperous future for the nation. With a clear grasp of the interplay between socioeconomic factors and aging rates, this study lays a critical foundation for informed decision-making and policy formulation, which is indispensable for effectively addressing the complexities inherent in China's aging society.

China's Aging Situation

i. China's population aging process

China's population aging process has been delineated into four distinct phases, as explicated in the "Report on the Main Body of the National Strategy for Coping with Population Aging (2014)". From 1999 to 2022, the first stage of population aging will accelerate significantly, with the elderly population increasing to 268 million and the aging level soaring to 18.5%. In the second stage, from 2023 to 2036, the aging of the population will continue to accelerate, with the elderly population reaching 423 million, and the aging level will further increase to 29.1%.

The third and fourth stages (2036 to 2100) depict the subsequent stages of population aging. The third stage is the continuous aging of the population. The peak of the elderly population reached 487 million, and the aging level rose to 34.8%. The fourth stage (2054 to 2100) is the plateau period of population aging. The elderly population has decreased to 383 million, and the aging level has stabilized at about one-third (Figure 1).

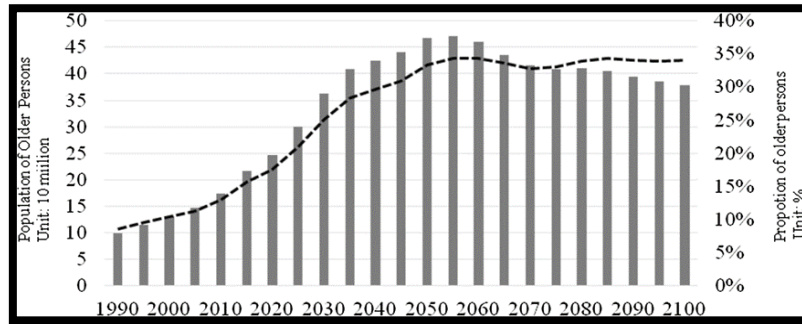


Fig 1 Size and proportion of population 60+, 1990–2100

Source: Academic Team of the Research on Trends and Strategy of Population Ageing (2014) *Research on Trends and Strategy of Population Ageing*. Silver Age Press, Beijing, pp 32–87

ii. The characteristics of population aging:

China's population aging has several prominent characteristics that are different from other countries. First, China has a substantial elderly population. In 2013, the number of people aged 60 and above exceeded 200 million, expected to reach 400 million by 2033. Secondly, China's aging process is accelerating. By the middle of the 21st century, population aging is estimated to rise from one-seventh to one-third. This is a transformation in just 40 years since the beginning of the 21st century. Third, there is a large number of elderly people. By the middle of this century, the number of elderly people aged 80 and over had exceeded 100 million, accounting for 22.3% of the total population aged 60 and over (World Bank, n.d.; Lu & Liu, 2019).

In addition, the aging gap in China is noticeable, and the growth of the elderly population fluctuates due to the dynamic changes in population development. Finally, due to fluctuations in population growth rates in different historical periods, China's aging pattern also fluctuates. These unique characteristics pose unique challenges for addressing the needs and welfare of the elderly population in China (Sagaza, 2004; Wang & Mason, 2007).

iii. Challenges of China's aging population:

One of the main challenges is the increasing pressure on the healthcare and social welfare systems. As the elderly population grows, there is an increasing demand for healthcare and elderly care services. The surge in demand could overwhelm existing healthcare infrastructure and drive-up costs, potentially jeopardizing the quality and accessibility of care for older and younger populations. As a result, social welfare systems will be under pressure to provide adequate support for older people.

Another key challenge is potential labour imbalances. As the population continues to age, there is a risk that the working-age population will shrink, which could lead to a shortage of skilled workers, which in turn could hamper economic growth. Furthermore, this reduction may lead

to an increase in the dependency ratio, making it all the more necessary to find solutions to ensure a strong and sustainable workforce for the future.

iv. Study Overview:

Firstly, the study outlines the distinct characteristics and challenges associated with the rise in China's aging rate, emphasizing the importance of understanding the underlying mechanisms. Subsequently, the content of related literature is discussed. The chosen analytical framework, the Ordinary Least Squares method, is then explicated, and the stability tests of the data are reported. Following this, a model is proposed to examine the impact of socioeconomic variables on the aging rate. A detailed discussion of the research findings, along with an analysis, implications, and recommendations for addressing China's aging population, follows. The study also includes an author statement, acknowledgments, and references at the end.

LITERATURE REVIEW

In recent years, numerous scholarly investigations have explored the intricate relationship between population aging and various socioeconomic variables within the Chinese context. Among the noteworthy studies in this domain are "Social Security System and Fertility Preferences in China: An Analysis of Household Survey Data" by Niu (2014), "Trends and challenges for population and health during population aging — China, 2015–2050" by Luo, Su, and Zheng (2021), and "Aging and Quality of Life in China" by Zhou et al. (2018) delve into this intricate relationship, exploring factors such as poverty levels, education levels, and healthcare systems. These studies collectively underscore how China's aging population is influenced by diverse socioeconomic aspects, impacting the overall well-being and quality of life of older adults.

For instance, Niu (2014) highlights the inadequacy of China's social security system in meeting the needs of an aging population, leading to increased family burdens and reduced fertility preferences among the younger generation. Luo, Su, and Zheng's (2021) work focuses on the challenges posed by population aging, including healthcare and pension system implications. Furthermore, Lu and Liu (2019) establish a strong correlation between GDP and China's aging rate, emphasizing how economic growth contributes to population aging. Rapid urbanization also plays a role, with urban living costs impacting fertility rates. Numerous studies have also examined the challenges encountered by China's elderly population.

Examining the challenges faced by China's elderly population, Zhou et al. (2018) shed light on limited access to healthcare and social isolation, significantly impacting the social welfare system. Overall, the reviewed studies underscore the close nexus between China's aging population and socioeconomic factors, emphasizing the need for targeted policies to safeguard the well-being and quality of life of older individuals. Future research should further explore additional socioeconomic factors and identify efficient strategies to address the challenges of population aging in China.

Numerous prior empirical studies (Chen et al., 2022; Feng et al., 2020; Lee, 2020; Lu & Liu, 2019; Niu, 2014; Wang & Mason, 2007) have extensively examined a range of crucial socio-economic factors, such as rapid economic growth, surging commodity prices, rising living costs, family planning policies, and urbanization rates, among others. The contemporary state of these socio-economic determinants further underscores their ongoing influence on the demographic landscape of China. Specifically, the sustained and rapid economic growth, combined with escalating commodity prices and living costs, has augmented the economic burden of childbearing, leading to a decline in childbirth rates and a subsequent rise in the aging rate. Additionally, the impact of the one-child policy, followed by the two-child policy and other fertility-suppressing measures, has been pronounced in shaping the aging population. Moreover, the continued advancement of urbanization has exacerbated the aging challenge, with the significant migration of rural populations to urban centers substantially affecting the number of newborns and contributing to an increased aging rate.

In conclusion, the convergence of reviewed studies and existing literature underscores the robust nexus between the expansion of population aging in China and diverse socio-economic factors, including poverty levels, education levels, and the inadequacy of a comprehensive social security system for the elderly. Accordingly, future research endeavors may continue to explore the influence of additional socio-economic factors on the accelerated aging rate in China, aiming to identify effective strategies to address the challenges posed by population aging.

RESEARCH METHODOLOGY

To investigate the correlation between aging rates and socioeconomic factors in China, data from the World Bank covering the years from 1978 to 2019 were utilized. The dataset included information on gross domestic product (GDP), consumer price index (CPI), urbanization rate, unemployment rate, and family planning policy, which are essential variables for the analysis. The analysis methodology employed in this study involved the utilization of an ordinary least squares (OLS) regression model to examine the influence of various socioeconomic variables on aging rates. The OLS regression model is commonly employed in statistical analysis and possesses several desirable properties when certain assumptions are met.

In the OLS regression model, the OLS estimator is consistent for the level-one fixed effects when the regressors are exogenous and exhibit perfect collinearity, satisfying the rank condition (Angeles et al., 2005). Moreover, the OLS estimator is consistent for the variance estimation of the residuals when the regressors possess finite fourth moments. Furthermore, according to the Gauss-Markov theorem, the OLS estimator is optimal within the class of linear unbiased estimators when the errors are homoscedastic (exhibiting constant variance) and serially uncorrelated. Consequently, under these specified conditions, the OLS method provides a minimum-variance mean-unbiased estimation, assuming the errors possess finite variances (Angeles et al., 2005).

In addition to these conditions, when the errors are assumed to follow a normal distribution with a mean of zero, the OLS estimator becomes the maximum likelihood estimator, surpassing any non-linear unbiased estimator in terms of performance (Angeles et al., 2005). Given these advantageous properties, the OLS test approach was selected as the analytical framework for this study.

Before performing the OLS test, we first need to perform a stability test on the data.

Table 1 Stability test

| | ADF-value | 1% level | 5% level | 10% level | Prob. |
|-----|------------------|-----------------|-----------------|------------------|--------------|
| AR | 3.239379 | 2.628961 | -1.950117 | -1.611339 | 0.9995 |
| CPI | -3.111557 | -4.205004 | -3.526609 | -3.194611 | 0.1175 |
| FPP | -1.601562 | -4.198503 | -3.523623 | -3.192902 | 0.7751 |
| GDP | -0.060373 | -4.284580 | -3.562882 | -3.215267 | 0.9933 |
| UNE | -3.449522 | -4.198503 | -3.523623 | -3.192902 | 0.0588 |
| URB | -3.356125 | -4.205004 | -3.526609 | -3.194611 | 0.0720 |

Table 1 presents the results of the stationarity test conducted for each variable. The assessment is based on the p-value of the Augmented Dickey-Fuller (ADF) statistical value. Specifically, if the p-value is below 0.01, it signifies that the variable is stationary at a significance level of 1%; if the p-value is below 0.05, it indicates stationarity at a significance level of 5%. The findings reveal that the original series of all variables are non-stationary, but their first-order differences exhibit stationarity. This suggests that these variables possess an I(1) relationship, implying the possibility of a first-order cointegration relationship.

The study explores the impact of various socioeconomic variables on aging rates in China through three proposed models. The dependent variable, ln AR_t, represents the log of the aging rate for the specific year "t." The study considers several independent variables, including ln GDP_t (log of China's GDP for year "t"), ln CPI_t (log of the consumer price index of China for year "t"), ln UNE_t (log of the unemployment rate of China for year "t"), and ln URB_t (log of the urbanization rate of China for year "t"). Additionally, a dummy variable, D_{fp}, is incorporated to account for the impact of the family planning policy. The three models, each characterized by different sets of independent variables, aim to capture and quantify the relationships between these socioeconomic factors and aging rates in China.

Below is the proposed models for studying the effects of socioeconomic variables on aging rates:

$$\ln AR_t = \beta_0 + \beta_1 \ln GDP_t + \beta_2 \ln CPI_t + \epsilon_t \quad \dots\dots \quad (1)$$

$$\ln AR_t = \beta_0 + \beta_4 \ln UNE_t + \epsilon_t \quad \dots\dots\dots\dots\dots\dots \quad (2)$$

$$\ln AR_t = \beta_0 + \beta_3 \ln URB_t + \beta_5 D_{fp} + \epsilon_t \quad \dots\dots\dots \quad (3)$$

where,

$\ln \text{AR}_t$ = the log of the aging rate of China for year t.

$\ln \text{GDP}_t$ = the log of GDP of China for year t.

$\ln \text{CPI}_t$ = the log of the consumer price index of China for year t.

$\ln \text{UNE}_t$ = the log of the unemployment rate of China for year t.

$\ln \text{URB}_t$ = the log of urbanization rate of China for year t.

Dfp = dummy variable for family planning policy.

FINDINGS AND DISCUSSION

In this section, we present the findings and subsequent analysis derived from our study.

Table 2 Correlations between aging rate and five socioeconomic variables

| | AR01 | CPI | DFP | GDP | UNE | URB |
|------|-------------|------------|------------|------------|------------|------------|
| AR01 | 1.000000 | 0.949567 | -0.730141 | 0.933662 | 0.567328 | 0.990391 |
| CPI | 0.949567 | 1.000000 | -0.872774 | 0.816394 | 0.555646 | 0.967156 |
| DFP | -0.730141 | -0.872774 | 1.000000 | -0.511548 | -0.447775 | -0.765521 |
| GDP | 0.933662 | 0.816394 | -0.511548 | 1.000000 | 0.537513 | 0.909535 |
| UNE | 0.567328 | 0.555646 | -0.447775 | 0.537513 | 1.000000 | 0.570929 |
| URB | 0.990391 | 0.967156 | -0.765521 | 0.909535 | 0.570929 | 1.000000 |

In the correlation matrix table, we can observe the correlations between the variables. Correlation coefficients range from -1 to 1, where -1 indicates a perfect negative correlation, 1 indicates a perfect positive correlation, and 0 indicates no correlation.

The log of the aging rate ($\ln \text{AR}_t$) in China shows strong positive correlations with the log of the consumer price index ($\ln \text{CPI}$) ($r = 0.95$) and the log of the urbanization rate ($\ln \text{URB}$) ($r = 0.97$), indicating that as the consumer price index and urbanization rate increase, the aging rate also tends to increase. Additionally, the log of the aging rate exhibits a moderate positive correlation with the log of China's GDP ($\ln \text{GDP}$) ($r = 0.93$), suggesting that a higher GDP is associated with a higher aging rate in the country. Furthermore, the log of the aging rate displays a weak positive correlation with the log of the unemployment rate ($\ln \text{UNE}$) ($r = 0.57$),

indicating a slight association between a higher unemployment rate and a higher aging rate in China.

Overall, the correlation matrix provides valuable insights into the relationships between the variables and serves as a foundation for further regression analysis to better understand how these socioeconomic factors influence the aging rates in China.

Table 3 Summary of results

| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| CPI | 0.006401 | 0.0004801 | 3.34331 | 0.0000 |
| GDP | 0.000327 | 2.90 E-051 | 1.28552 | 0.0000 |
| UNE | 1.153818 | 0.264809 | 4.357174 | 0.0001 |
| DFP | 0.306043 | 0.147681 | 2.072319 | 0.0449 |
| URB | 0.172038 | 0.0053923 | 1.90461 | 0.0000 |

According to Table 3, in general, almost all variables have a significant influence on aging rates. It shows that the consumer price index, gross domestic product, and urbanization rate are significant at $\alpha=1\%$ with a probability of 0.0000 and this also happens to the unemployment rate. However, the variable of family planning policy also has a significant effect, only on $\alpha=5\%$ with probability 0.0449 which is below 0.05.

Furthermore, the coefficient of the consumer price index is 0.0064, which indicates that if the consumer price index increases by 1 level the aging rate also increases by 0.0064 years. Next, the variable of gross domestic product, if this variable increases by 1 yuan, then the aging rate also increases by 0.0003 years. This also applies to the variable of urbanization rate, where this variable increase by 1 percent then the aging rate also increases by 0.1720 year. Meanwhile, for the unemployment rate variable if there is an increase of 1 person, then the aging rate also rises at 1.1538 years. Finally, if the variable of family planning policy increases for 1 level then the aging rate will increase by 0.3060 years. Then, that can be formulated by:

$$Y = \alpha + 0.0064X_1 + 0.0003X_2 + 1.1538X_3 + 0.3060X_4 + 0.1720X_5 + \varepsilon \dots (4)$$

This is shown in Table 4.

Table 4 The results of the variables CPI and GDP

| Dependent Variable: AR01 Method: Least Squares Date: 05/21/23 Time: 22:26 Sample: 1978 2019 Included observations: 42 | | | | |
|---|-------------|-----------------------|-------------|----------|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| CPI | 0.006401 | 0.000480 | 13.34331 | 0.0000 |
| GDP | 0.000327 | 2.90E-05 | 11.28552 | 0.0000 |
| C | 3.765066 | 0.138208 | 27.24209 | 0.0000 |
| R-squared | 0.976951 | Mean dependent var | | 6.981559 |
| Adjusted R-squared | 0.975769 | S.D. dependent var | | 2.156992 |
| S.E. of regression | 0.335767 | Akaike info criterion | | 0.723951 |
| Sum squared resid | 4.396842 | Schwarz criterion | | 0.848070 |
| Log likelihood | -12.20297 | Hannan-Quinn criter. | | 0.769446 |
| F-statistic | 826.5087 | Durbin-Watson stat | | 0.229882 |
| Prob(F-statistic) | 0.000000 | | | |

According to Table 4, both the CPI and GDP coefficients are positive, and their p-values of 0.0000 are significantly less than 0.01. This indicates a positive relationship between these variables and the aging rate at a 1% significance level. It suggests that rapid economic growth and price increases contribute to the growth of the aging rate.

Table 5 The results of the variables DFP and URB

| Dependent Variable: AR01 Method: Least Squares Date: 05/21/23 Time: 22:35 Sample: 1978 2019 Included observations: 42 | | | | |
|---|-------------|-----------------------|-------------|----------|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| DFP | 0.306043 | 0.147681 | 2.072319 | 0.0449 |
| URB | 0.172038 | 0.005392 | 31.90461 | 0.0000 |
| C | 0.594702 | 0.241000 | 2.467646 | 0.0181 |
| R-squared | 0.982771 | Mean dependent var | | 6.981559 |
| Adjusted R-squared | 0.981888 | S.D. dependent var | | 2.156992 |
| S.E. of regression | 0.290290 | Akaike info criterion | | 0.432877 |
| Sum squared resid | 3.286466 | Schwarz criterion | | 0.556997 |
| Log likelihood | -6.090423 | Hannan-Quinn criter. | | 0.478372 |
| F-statistic | 1112.344 | Durbin-Watson stat | | 0.160930 |
| Prob(F-statistic) | 0.000000 | | | |

According to Table 5, the coefficient of the family planning policy (Dfp) is 0.3060. Although its p-value is greater than 0.01 but still less than 0.05, the null hypothesis can still be rejected, indicating a positive relationship between this variable and the explained variable in general. As expected, the family planning policy exhibits a statistically significant positive relationship with the aging rate. The coefficient of the urbanization rate (URB) is 0.1720, and its p-value of 0.0000 is significantly less than 0.01. This suggests a positive correlation between the urbanization rate and the aging rate at a 1% significance level. It implies that the elderly population may constitute a larger proportion of the urban population compared to the rural

population, thus temporarily validating the hypothesis that an increase in the urbanization rate leads to a higher aging rate.

The regression results are derived from the aforementioned formula. The R-squared values of goodness of fit for the explanatory variables are 0.977, 0.322, and 0.983, respectively. These values indicate that while the unemployment rate exhibits a lower explanatory power of 32% and lacks a strong fitting effect, the other variables such as GDP, CPI, urbanization rate, and family planning policy exhibit high explanatory power and demonstrate a good fitting effect.

The F statistic value serves as an indicator to assess whether the equation adheres to a linear relationship.

The null hypothesis posits that the equation does not follow a linear relationship.

If the probability value (p-value) is less than 0.05, the null hypothesis is rejected, indicating a statistically significant linear relationship in the equation. In our results, the p-values of the F statistics are all significantly below 0.01, indicating that the overall equation conforms to a linear relationship at a significance level of 1%. Moreover, the F statistic values of Result 1 and Result 3 are 827 and 1112, respectively, indicating a high level of explanatory power in the model. However, result 2 exhibits a lower F statistic value of 19, suggesting that the variable of the unemployment rate has limited explanatory power within the model.

IMPLICATIONS AND RECOMMENDATIONS

Given China's status as the country with the largest elderly population worldwide, addressing population aging is of paramount significance for its socio-economic development. This section presents several thoughts and recommendations to effectively tackle aging and mitigate the aging rate.

1. Addressing the positive relationship between the aging rate and GDP and CPI, it becomes evident that China's rapid economic growth, accompanied by escalating commodity prices and living costs, has increased the financial burden of childbearing. Consequently, the willingness of Chinese individuals to have children has declined, resulting in a significant decrease in newborns and a subsequent rise in the aging rate. To address this, governments can adopt a comprehensive approach, encompassing both macroeconomic and structural measures, to effectively address the challenges presented by an aging population. Firstly, emphasis should be placed on prioritizing the quality of development over sheer quantity, achieved through targeted structural reforms that prioritize innovation, technological progress, and industrial upgrading. By implementing such reforms, the economy can experience healthier and more sustainable GDP growth. Secondly, prudent fiscal and monetary policies should be deployed to control inflation and prevent unwarranted escalation of the CPI. Utilizing fiscal measures to adjust demand and employing monetary policy to regulate the money supply will enable the government to maintain price stability and alleviate the economic burden on citizens. Additionally, supporting social welfare programs and pension systems is paramount in

addressing the challenges posed by an aging population. Such support will relieve retirees of financial pressures, empowering them to actively participate in the economy.

2. The data analysis conducted in this study underscores that there is a significant positive correlation between the family planning policy and the aging rate. Specifically, the one-child policy and subsequent two-child policy, along with other birth-suppressing measures, have had a pronounced effect. To effectively tackle the aging population challenges, the government should maintain its existing family planning policy while implementing targeted adjustments to encourage higher birth rates. This can involve allowing more affluent families to have more children and offering additional incentives and benefits to support larger families. Concurrently, policies should be implemented to encourage childless families to have their first child, entailing financial support, improved childcare services, and flexible work arrangements to address concerns surrounding child-rearing. Moreover, the government should diligently raise public awareness and understanding regarding childbearing policies through a variety of channels, including public campaigns and educational programs. Learning from successful childbearing incentive policies implemented in other countries can yield valuable insights and guidance to bolster support for families in their decision to have children. By effectively implementing these measures, the government can cultivate a balanced population structure, mitigate the impact of an aging population, and sustainably address the challenges it poses.

3. Increased urbanization rate will lead to faster aging. In the past, when China's urbanization rate was relatively low, many rural families had three or more children (Angeles, Guilkey, & Mroz, 2005). However, with the rapid urbanization, a substantial number of farmers migrated to cities for work and settled there. The fast-paced urban lifestyle and high levels of stress make it increasingly difficult to sustain the previous practice of having multiple children. Most urban residents now have one or two children, while some couples even opt not to have children at all. This population shift from rural to urban areas has significantly impacted the number of newborns and subsequently led to an increase in the aging rate (Lu & Liu, 2019). To address this, the Chinese government should reassess its focus on the development of large cities and instead provide greater support to small and medium-sized cities and rural areas (Feng et al., 2020). Guiding more farmers to return to their hometowns to work, start businesses, and reside will not only alleviate the strain on major cities but also revitalize rural areas, facilitating a more balanced population distribution, higher birth rates, and a more optimal population structure.

4. The government should actively promote the growth and development of aging-related initiatives and industries to prepare for the long-term challenges posed by population aging (Lee, 2019). Establishing and enhancing a legal framework to safeguard the rights and interests of the elderly is essential to facilitate the growth of aging-related endeavors and industries. Currently, China's legal system concerning the elderly lags behind the pace of population aging in terms of development and coverage (Feng et al., 2020). Therefore, the country should draw lessons from advanced nations and expedite the improvement of its legal system for the elderly. With the increasing number of elderly individuals in China, services related to elderly health, sports, cultural entertainment, finance, and tourism will experience substantial growth. It is

crucial for the government to promptly enhance policies and legislation pertinent to the aging sector and industry, addressing China's increasingly pressing aging challenge (Wang & Mason, 2007).

By implementing these recommendations and enacting appropriate policies and legal measures, the Chinese government can effectively confront the profound implications of population aging and pave the way for a more sustainable and prosperous future.

CONCLUSION

This study provides valuable insights into the complex relationship between socio-economic variables and China's aging rate. The results demonstrate a significant positive correlation between GDP, CPI, urbanization rate, and family planning policy with the aging rate, highlighting their key roles in shaping China's population pattern and influencing population aging.

Firstly, the research reveals that rapid economic growth and rising prices contribute to a higher aging rate. The positive coefficients of GDP and CPI indicate that as the economy grows and living costs increase, the financial burden of childbearing intensifies, resulting in a decline in individual willingness to have children, thereby driving up the aging rate. This emphasizes the importance of addressing the cost of living and incentivizing fertility through macroeconomic measures to stem the decline in the birth rate and maintain a stable and healthy population growth.

Secondly, the study finds a statistically significant positive correlation between the family planning policy and the aging rate. The coefficient of the family planning policy (Dfp) shows that the policy has a significant impact on the aging rate. Research suggests that the one-child policy and subsequent two-child policy, along with other fertility-suppressing measures, contributed to the observed effects. To effectively address the challenges of population aging, the government should make targeted adjustments while adhering to existing policies to encourage higher fertility rates and support families in actively procreating.

Thirdly, the findings highlight the high correlation between China's urbanization rate and population aging. With the advancement of urbanization, a large number of farmers have migrated to cities to work and settle down, resulting in a decline in the birth rate, which in turn leads to an increase in the aging rate. In view of this, the Chinese government should shift the focus of development from concentrating on the development of large cities to increasing support for small and medium-sized cities and rural areas. Guiding more farmers to return to their hometowns to work, start businesses, and settle down will revitalize the countryside, balance the population distribution, increase the fertility rate, and ultimately ease the pressure on big cities.

In conclusion, this study provides valuable insights into the multifaceted dynamics driving

population aging in China. Policymakers should consider the impact of GDP, CPI, urbanization rate, and family planning policies when formulating effective strategies to address the challenges of population aging. By implementing targeted policies such as lowering the cost of living, liberalizing family planning policies, and supporting births, the government can encourage higher birth rates and mitigate the impact of population aging on the country's future. Besides, to further refine the findings, more research on other potential influencing factors of population aging in China would be beneficial. For example, research can explore the impact of healthcare policies, education policies, and technological advances on aging rates. In addition, the study can also examine the specific impact of urbanization on different regions of China to formulate more targeted policies and interventions. Overall, a more comprehensive understanding of the factors driving population ageing will allow policymakers to develop more effective strategies to address this pressing problem. Finally, the study highlights the importance of being proactive in addressing population aging. Instead of waiting for problems to turn into crises, policymakers should act now to address the root causes of population ageing.

ETHICS STATEMENTS

As this study did not involve interviewees, informed consent was not required from respondents.

AUTHOR STATEMENTS

Zhou Xiaolang was responsible for the writing of the entire paper, including the problem statement, literature review, data collection, data analysis, and conclusion. Doris Padmini Selvaratnam provided tutoring, review, inspection, and revision of the article, offering guidance and feedback throughout the research process.

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DECLARATION OF INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this thesis.

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