

The Effect of Declining Male to Female Gender Ratio on Distribution Pattern in China

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Received: 24 June 2024; Accepted: 12 July 2024; Published: 24 July 2024

Abstract:

Based on the data of China's seventh population censuses and existing literature, this paper sorted out the history, current situation and characteristics of the change of China's gender ratio between men and women, combined with China's national conditions in the new era, firstly analyzed the possible factors affecting the decline of China's gender ratio between men and women from the theoretical level, summarized its development trend, and based on simulation analysis, system dynamics (SD) was used. Based on China's national conditions, this paper predicts the male to female gender ratio in China. In terms of the impact of the decline of the gender ratio on the pattern of income distribution, there are two ways to analyze the impact of the decline of the gender ratio on the pattern of national income distribution: one is the adjustment of the family planning policy - imbalance of the gender ratio - female employment; the other is the decline of the gender ratio - labor supply - social and economic development. There are two ways to analyze the impact of the declining gender ratio on the income distribution gap of residents: one is the concept of gender role - female labor participation - reducing the income of middle and low-end women; the other is the traditional concept of gender in China - the impact of gender inequality - the income gap between men and women.

Keywords:

Gender Ratio, Distribution Pattern

1. Introduction

In 2021, the tenth meeting of the Financial and Economic Commission of the CPC Central Committee stressed that "expanding the proportion of middle-income groups, increasing the income of low-income groups, rationally adjusting high incomes, banning illegal incomes, and forming an olive distribution structure with large middle and small two ends" to promote common prosperity in high-quality development, but how the gender ratio affects the "olive" income distribution pattern. How the shape of the "olive" income distribution pattern changes, and what kind of "olive" income distribution pattern is conducive to the realization of common prosperity remains to

be considered. In this regard, in order to cope with more challenges faced by China's population gender structure in the new era, the main problems to be solved in this paper are as follows: First, based on the data of China's seven population censuses and existing literature, the historical changes of China's male to female gender ratio and the impact of policies are re-sorted out, and the future changes of population gender structure are scientifically predicted; The second is to analyze the relationship between gender ratio and income distribution pattern, and try to study the influencing mechanism.

Gender is an integral part of the population composition, and it is also a perspective worthy of further study. The impact of the gender ratio on the pattern of income distribution is an important social issue, because it involves the principle of social equality, social justice, economic benefits and social stability, etc. It can be found from the previous literature. Scholars' studies on the impact of gender on income mostly focus on the five aspects of floating population, education, rural areas, labor market/participation (employment), and gender discrimination, and the research direction is not always a single study, and some scholars even combine two or three perspectives to discuss. For example, the first three aspects mentioned above are usually studied by scholars under the same theme. Hu [4] found in his research that the increase of urban hukou threshold expands the gender wage gap of the floating population, and higher hukou threshold significantly reduces the wage income of women while significantly increases the wage income of men. Yu et al. [16], using the sample data covering seven provinces, adopted situational scheme setting and psychological experiment methods, and found that rural men are more inclined to choose the distribution plan that adjusts the gender income gap through income redistribution. However, with the increase of the initial gender income distribution gap and the increase of male transfer quota, the possibility of rural men in favor of adjustment decreases. In addition, some scholars pointed out that the increase in education level will significantly improve the employment quality of the floating population. Within the floating population, education has a greater effect on the employment quality, income and employment stability of the male migrant population than that of the female migrant population. Therefore, the number of births has a negative impact on the wage income of different quantiles, and this negative impact is more significant in low-income women.

Next, it takes the labor market as the theme, and the scholars' research time span is relatively large. Wang (2015) used measurement methods to draw the conclusion that the wage difference between men and women is mainly caused by the wage difference in the same industry [10]. Deng et al. (2012) used a multi-layer linear interactive classification model to comprehensively consider the impact of individual human capital and labor market segmentation on income level and gender income gap, and found that a large number of female workers working in the primary industry and informal labor market due to their low education level was an important reason for the gender income gap [2]. He et al. (2020) OLS regression results show that women's income is 40% lower than men's. For high-income groups, women's housework burden is still higher than men's. [3]

The core issue of this paper is to study a series of Chinese population structure phenomena and promote the formation of a stable and reasonable income distribution pattern. Entering the new era, the CPC Central Committee has put the gradual optimization of income distribution in a more important position. Optimizing the pattern of income distribution is an important way to achieve the goal of common

prosperity, and it is also an important step to promote the completion of Chinese-style modernization.

2. Status of the Male to Female Gender Ratio

2.1. The gender ratio between men and women and its significance

The population, a social group determined by the XY genotype, is basically divided into two main types, the male population (46, XY) and the female population (46, XX), and the population with sexual abnormalities (deformities) is so rare that it is not taken into account. Therefore, demography refers to the gender structure of the population as the proportion of the male population in the total population and the proportion of the female population in the total population, which is called the population gender ratio, or the gender ratio. This paper takes the female population as 100 and calculates the relative number of the male population to represent the gender structure of the population. The index population gender ratio, which indicates whether the population gender structure is balanced or not, should be 100 according to the biological genetic law of homologous chromosome separation and non-homologous chromosome free combination, and the proportion of sexual population should be 50% for both men and women. However, due to the difference in the size and quality of sex chromosomes X and Y, it is natural for the gender ratio at birth to be higher than 100. However, it is internationally recognized that the upper limit of the gender ratio at birth is 107, and if it is higher than this value, it indicates that there is an improper act to interfere with the birth sex. During the period of family planning in China, due to the traditional conception of fertility, there existed the problem of artificial birth sex selection, which led to the situation that the gender ratio at birth was higher than 107, which affected the gender structure balance of the population. Therefore, the gender ratio of population is not only the natural attribute of population, but also the variable parameter of social factors' influence on population in the process of social development. This parameter changes with the change of people's ideas in the development of society. Population development refers to the moderation of population number and the rationality of population structure. The rationality of population structure includes not only the rationality of age structure, but also the balance of gender structure. The problem of gender ratio between men and women, especially the problem of gender ratio between men and women at birth, is the subject of widespread concern. Therefore, based on the data of the seventh population censuses in New China, this paper studies the gender ratio in China to understand whether the gender structure of the Chinese population is balanced or not and the changes in the gender ratio, which provides a reference for the academic research on population issues and provides a theoretical basis for how the gender ratio affects the income distribution pattern in China.

2.2. Characteristics of the male to female gender ratio

Since the founding of the People's Republic of China, it has only taken a short period of more than 30 years for China's population reproduction type to achieve a historic transformation that took Western countries a hundred years to complete. At the same time, the population structure has also changed in the more than 70 years since the founding of New China. The data of the gender ratio of the population age group in the seven censuses of New China show the changing characteristics of the gender ratio of the population, which indicates the unity of the natural and social

attributes of the population. The natural attributes of population (genetic composition, gender structure) are the basis of population as a higher social animal, and the social attributes of population are the essential attributes that dominate population development and are affected and determined by social factors. The gender ratio of the total population in different periods is in a reasonable range of 100-107, but the gender ratio of the same population in different periods in the cross section continues to decline with the increase of age, showing a “young high old low” - a seesaw situation. However, by comparing the trajectory of population gender ratio in different periods, we can see several main characteristics of its changes influenced by social factors over time.

a. The gender ratio at birth is different in different stages of social development, which reflects the phenomenon that the gender ratio at birth is affected by the population policy and produces human intervention.

b. With the passage of time and social development, the gender ratio of the population aged 100 years and above gradually decreased and stabilized at the bottom, and the survival advantage of the female population became more and more obvious.

c. Since the founding of New China, the gender ratio of the same age group of the population has changed at different points in time, showing a more obvious trend of change in the reproductive age group and the menopausal population group, which basically showed a gradual decrease in the gender ratio of the population over time, while the gender ratio of the elderly population increased slightly. This phenomenon reflects the impact of gender roles on population health with the development of society in China.

d. Since the founding of the People's Republic of China, the gender ratio of the population of the age group less than 100 has been declining over time. The gender ratio of the same age group of the population has changed over time, and there are two aspects of concern. On the one hand, the age group with a gender ratio of less than 100 is gradually moving backwards. On the other hand, the gender ratio of the elderly population in the same age group obtained by the fourth population census, the fifth population census and the sixth population census in China has increased from the previous month.

In short, the gender ratio of the population is determined by the gender ratio of the population at birth and the gender ratio of the population at death. The change of the population gender ratio is the superficial data change seen by people. These statistics imply profound meaning, which can be summarized in a word: social development narrows the difference between the mortality rate of Chinese male population and female population, resulting in the decrease of the population gender ratio with the increase of age, and when the highest age group is stabilized and slowly rising, the gap between the life expectancy of female population and the life expectancy of male population is narrowing.

2.3. Prediction of the male to female gender ratio

Population plays an important role in the process of economic growth. As a measure index reflecting the actual situation and future trend of regional human resources, population structure is more closely related to the pattern of national income.

Based on simulation analysis and system dynamics (SD), Ke et al. predicted the demographic structure of China's male to female gender ratio based on China's national conditions. The difference between the predicted value and the real value of the gender ratio in China from 2011 to 2020 is less than 1%, so the predicted value of the model can be trusted. Based on this, it is concluded that in 2030, China's male to female gender ratio will slowly decline. This is shown in the following Table 1 and Figure 1.

The gender structure of population is the result of social influence on the basis of natural attributes, and human intervention can not shake the overall balance of population gender structure. However, the gender structure of the population fluctuates under the influence of people's ideology and social environment. Since the founding of the People's Republic of China, the population development and the change of the gender structure or the change of the population gender ratio clearly show that the social development has prompted the change of the gender structure of the male and female population (gender ratio). [5]

Table 1. Simulation prediction of male to female ratio in China from 2011 to 2030.

year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Predicted value/%	51.22	51.17	51.12	51.07	51.02	50.97	50.92	50.87	50.82	50.77	50.72	50.67	50.62	50.57	50.52	50.47	50.42	50.37	50.32	50.27
True value/%	51.26	51.25	51.24	51.23	51.22	51.21	51.20	51.19	51.18	51.17	51.16	51.15	51.14	51.13	51.12	51.11	51.10	51.09	51.08	51.07
Error/%	0.04	0.08	0.12	0.16	0.20	0.23	0.24	0.25	0.26	0.46										

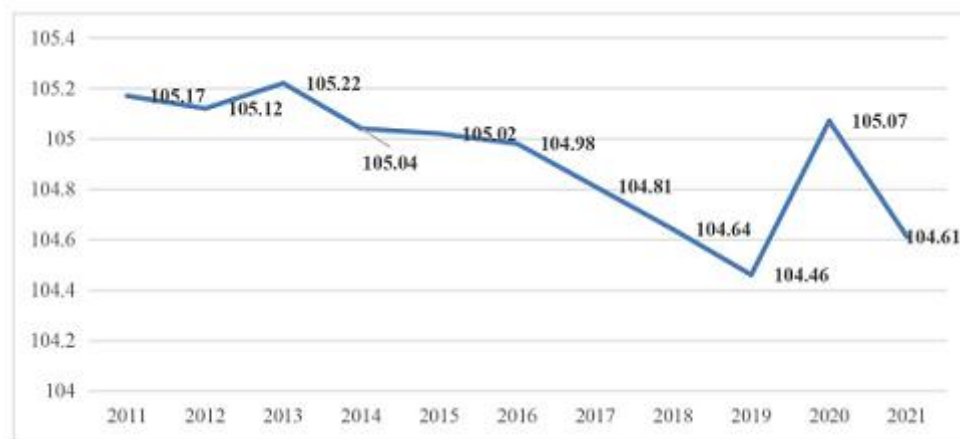


Figure 1. Gender ratio (female =100) in China, 2011-2021.

3. The Effect of Declining Male to Female Gender Ratio on Income Distribution Pattern

3.1. The impact of the decline in the gender ratio on the pattern of national income distribution

3.1.1. Affecting women's employment

Women are the main undertakers of reproductive behavior, and also an indispensable labor resource in the labor market. In the 1980s, China was in the period of economic transformation, with the rapid development of social economy, and the market demand for women's labor gradually increased. At the same time, the family planning policy limited the number of children, reducing the time for family care, and giving married women more time to participate in the social labor force. With the improvement of the overall economic development level and the promotion of the family planning policy, Chinese women's educational level has increased, the vocational training environment has gradually improved, the ability to participate in and discuss politics has improved, and women's rights and interests have been protected. These changes have elevated women's social and economic status, and greatly improved women's employment, family and economic conditions. Female labor force participation is rising. It has increased women's income sources and changed the pattern of national income distribution. [15] The country uses the family planning policy to limit the number of children in the family, and changes Chinese people's preference for boys also have a subtle effect, which increases the human capital investment in girls in the family and is conducive to improving the quality of female employment. Since the reform and opening up, although the social and economic status of women has been generally improved, compared with men, women are still at a disadvantage in the process of employment and career development in the labor market. The adjustment of the birth policy has lifted the limit on the number of women giving birth, which is bound to break the balance between women's birth and work during the period of the family planning policy. Making the problem of women's employment even worse. [17]

The successive implementation of "single second child" and "comprehensive second child" has had a very serious impact on both employment and career choice, as well as on women's future career development, mainly manifested in employment gender discrimination. Sheng [9] analyzed the impact of the implementation of the universal two-child policy from the perspective of female labor supply and demand. He believed that after the adjustment of the fertility policy, Women's income level will be relatively lower, the proportion of women's different pay for the same work will be higher, women who return to work after the childbearing period will be more likely to be transferred from their original jobs, women's employment willingness will be reduced, resulting in the reduction of female employment scale, and female employment structure will also be greatly affected. In general, the adjustment of the birth policy has a negative impact on women's employment quality, employment structure, career development, employment scale, etc., and then has an impact on the pattern of national income distribution.

3.1.2. Affect social and economic development

A decline in the gender ratio could boost social and economic development. Women's share of employment increases, employment equality increases, and the increase of women in the labor market will bring more human resources, improve productivity and national income levels. From the perspective of reducing labor costs, the increase of female labor force brings the increase of labor supply. On the one hand, the bargaining power of labor force in the market is reduced, so as to maintain the price advantage of products. On the other hand, the increase of female employment share is conducive to optimizing the internal resource allocation of industries and

enterprises. From the perspective of improving technological innovation, the improvement of the overall quality of female labor force makes the increase of female employment share bring more high-quality human capital, improve the technological innovation ability of export industries and enterprises, and promote the sustainable and healthy development of economy. [7]

3.1.3. The effect of declining male to female gender ratio on resident income distribution gap

In the process of reform and opening-up and economic globalization, women have made great progress in the field of social and economic activities, but the gender gap in labor market performance still persists. There are several typical facts about the gender differences in China's labor market performance: First, the labor participation rate of both sexes in China is on a downward trend, but the labor participation rate of women is always lower than that of men, and the decline is larger and more obvious; Second, there is a significant difference between men and women in the acquisition of occupational status in the labor market. Women's occupational status is significantly lower than that of men, and there is a trend of expansion; Third, the gender wage gap in the labor market persists and is gradually widening. Therefore, focusing on improving women's labor participation rate, occupational status and wage income is of great significance to effectively increase gender dividends and promote the long-term and stable development of China's social economy. [6]

With economic and social development, gender inequality in education continues to decrease significantly, especially the gender difference in years of education no longer exists in most people in recent years [12]. However, although education equality, an important aspect of human capital, is gradually realized, gender inequality in work and income still exists widely and even continues to expand. [11,1,14] China is a society with profound farming tradition and Confucian culture, so although it has entered the modern industrial society, there are still some traditional patriarchal gender division of labor and norms [8,13] At the same time, the socialist period in which "women can hold up half the sky" has passed, and after the reform and opening up, China's gender concept has appeared "twists and turns", and the academic community has generally found that the gender concept or practice has appeared "tide", and the field of social division of labor has a tendency to return to the tradition [14]. Therefore, the influence of China's traditional gender concept on gender inequality and then on the gender income gap and the specific mechanism of the influence deserve attention. [6]

4. Discussion

By sorting out the current situation and characteristics of the male-female gender ratio and predicting the future male-female ratio, this paper analyzes the impact of the declining male-female gender ratio on the pattern of national income distribution in two ways, and draws the following conclusions:

First, the decline in the gender ratio will have an impact on the employment situation of women. In recent years, driven by the improvement of the overall economic development level and the fertility policy, women's social status has risen, which has improved the employment situation of women and increased the labor supply in the labor market, which in turn has an impact on the distribution pattern of national income.

Second, the decline of the gender ratio will have an impact on the income distribution gap of Chinese residents, and the decline of the gender ratio is an important factor affecting the income balance between men and women. The decline in the gender ratio has led to a change in the concept of sexual roles, which firstly reduces the labor participation rate of women, secondly reduces the income of middle and low-end women, and finally exacerbates the income gap between men and women. On the other hand, China's traditional gender concept also has an impact on the gender income gap, which leads to gender inequality and further aggravates the gender income gap. Therefore, to solve the problem of income distribution gap of Chinese residents, we need to promote gender equality and promote gender income balance from two aspects of gender role concept and traditional gender concept.

5. Conclusions

As mentioned above, reducing the income gap between men and women can be done in the following ways:

(1) Reducing the gender pay gap: A decline in the male-female gender ratio may reduce the gender pay gap between men and women. A more balanced gender ratio can reduce discrimination and prejudice against women and increase women's pay, thereby improving the fairness of the final distribution.

(2) Promote the narrowing of the gap between the rich and the poor: the decline in the gender ratio may promote the narrowing of the gap between the rich and the poor. Women's progress in the labor market increases the income levels of lower-income groups while reducing the comparative advantage of higher-income groups, thereby improving the fairness of the final distribution.

(3) Improving social welfare: Changes in the gender ratio may improve the overall welfare level of society. The economic empowerment of women increases the total income of families and societies, thereby improving the equity of final distribution and raising the overall level of welfare.

(4) Reduce social inequality: A decline in the gender ratio may reduce social inequality. A more balanced gender ratio can reduce social inequality, alleviate social contradictions and conflicts, and promote social harmony and stability.

Conflicts of Interest

The author declare that there is no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

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