Near future of the Chinese economy as indicated in population decrease

By Yuji Miura
(hiraiwa.yuji@jri.co.jp)
Advanced Senior Economist
Economics Department

Summary

1. In the Seventh Population Census conducted in 2020, it came to light that the trend of a decreasing birthrate and aging population was accelerating faster than anticipated. It is expected that China's population will start to decrease in 2022. The following elements are pointed out as causes promoting the decreasing birthrate: (1) population decrease in reproductive-age women; (2) changes in the mindset of people nearing the life stage of marriage and childbearing, such as the tendency to marry later in life and less desire to have children; and (3) postponed marriage and childbearing due to the spread of COVID-19 infections.

2. Due to urbanization and popularization of higher education, current generations facing marriage and childbearing are increasingly more reluctant to have kids, and we expect that this decreasing birthrate trend will further accelerate going forward. Effects of relaxation of birth control measures such as the abolishment of the "One-child Policy" have only been temporary. Support measures such as the provision of childcare subsidies would not have a sufficiently large impact to stimulate motivation for childbearing.

3. The "floating population" excluding moves within the same city in 2020 was 375,820,000, which means that one out of four people in the country moved. The impact of this "floating population" on the increase/decrease of the population in provinces and cities has become significantly larger. Heilongjiang Province and Guangdong Province show a clear contrast when viewed from both the rate of population increase/decrease in 2020 compared to 2010 and the extent of increase/decrease calculated by subtracting the population in 2010 from the population in 2020; and we can say that Heilongjiang Province shows the state of "future China."

4. In Heilongjiang Province, the population growth rate has continued to persist below the average of China overall since 2013, and further slowdown is expected going forward. Population growth slowdown will be unavoidable in China overall as well, but the rate of slowdown of China as a whole will be more moderate than that of Heilongjiang Province due to a higher proportion of young people.

5. In Heilongjiang Province, the balance of the Urban Workers' Pension Scheme reserve fund started to go into the deficit in 2016. There is no doubt that the balance of this fund for the entire China will start to shrink sooner or later. As a result, pension finance in China will rapidly deteriorate, eventually becoming a headache in terms of national finance.

6. The earlier a population starts to decline in a region, the earlier housing prices start to decline and the larger the spread of the price decline. The Chinese housing market will become polarized between the regions where housing prices decline due to population decrease and regions where stable housing prices are maintained thanks to population increase.

7. Full-scale population decline in China is soon to occur, and poses several challenges for the Xi Jinping administration in its third term. Each of the challenges is hard to solve for the Xi Jinping administration—which is said to have solidified its power at the 20th National Congress of the Communist Party in October 2022—and has the potential to result in the slowdown of the Chinese economy and, ultimately, question the raison d'être of the Party.

Introduction

In May 2021, China released the results of the Seventh National Population Census, which revealed that aging of the country's population coupled with a declining birthrate has been progressing at a faster pace than expected. Even within China, some have forecast that China would see its population start to shrink in 2022. The Population Division of the United Nations Department of Economic and Social Affairs projected in the 2022 Revision of World Population Prospects that the population of China would start decreasing after having peaked at 1,420 million in 2021 and fall below 1,000 million in 2079. This means that China's population will start to decline very soon, and the decline curve will become steeper with each passing year.

How fast will China's population decline progress? Will the relaxation of China's birth control policy help counter the decline? And, if China's population continues to shrink, how will it impact the country's economy? Although we have seen a great deal of news about the declining population trend, only a few reports have addressed these questions. It is expected that the effects of the population decline in China will gradually manifest themselves, but in fact, they have already become visible in some regions. The most notable affected regions are Liaoning, Jilin, and Heilongjiang provinces in Northeast China. This article examines what kinds of problems will arise as China turns into a country with a shrinking population by focusing on these provinces experiencing population decline.

First, we will (1.) clarify that China's birthrate has been declining at a pace faster than projected by the Chinese government, and (2.) summarize the causes of the country's declining birthrate and the effectiveness of the countermeasures to stem the trend so far. Then, we will go on to (3.) present the prospect of the future demographic situation in China, where an increasing number of regions will face population decline due to the combined factors of increasing population outflow and a declining birthrate while the population will grow in several major cities in coastal areas. After that, we will (4.) point out that in addition to the slowdown in economic growth, problems such as increasing difficulty in terms of pension financing and real estate market slowdown will begin to surface in the country's population-declining regions. It is possible that the population decline will induce further deceleration of the Chinese economy and even bring about situations where the raison d'être of the Communist Party of China will be called into question.

1. Changes in the demographics of China over the past 10 years

Population prospects for China have changed substantially over the past 10 years. The country's birthrate has been dropping significantly since 2017, and in line with this trend, the projected figures of the Chinese population in the United Nations' World Population Prospects have been revised significantly downward. In response to these developments, even within China, an increasing number of people are expressing pessimistic views about the country's population prospects.

(1) Unstoppable population decline

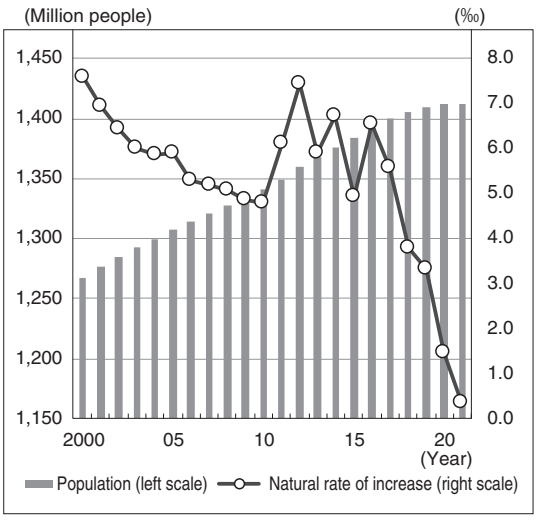
The results of the Seventh National Population Census published by the National Bureau of Statistics of China in May 2021 (hereinafter "the Seventh National Population Census," whose population survey was conducted in 2020) revealed that China's population is aging and its birthrates are falling at a faster pace than expected, which sent massive shockwaves among those both in and outside China. Even though the total population of 31 administrative divisions of China comprising provinces, directly governed cities and autonomous regions (excluding the populations of Hong Kong, Macau, Taiwan and China's foreign residents) stood at 1,412.12 million in 2020,

with an increase of 71.21 million from the total population of 1,340.91 million in 2010 when the previous National Population Census (the Sixth National Population Census) was conducted, the population's natural rate of increase, which represents the population increase or decrease per 1,000 people, declined significantly from 4.79‰ in 2010 to barely 1.45‰ in 2020.

The natural rate of increase refers to the difference between the birthrate and death rate of a region. If the birthrate of a region falls below its death rate, the natural rate of increase in that region becomes negative and its population starts to decrease. The natural rate of increase of the Chinese population has been declining substantially since 2017. According to a sample-based population survey in 2021, the population growth rate of China in that year was a mere 0.34‰, which demonstrates that an unstoppable decline is taking place in the natural rate of increase of the Chinese population (Fig. 1). This trend has yet to show any signs of change, suggesting that it will only be a matter of time before the population of China starts to shrink. The United Nations projected in World Population Prospects 2022 issued in July 2022 that China's population will start declining in 2022, which is nine years earlier than 2031, the originally projected peak year of the country's population indicated 10 years earlier in World Population Prospects 2012 (see Fig. 3).

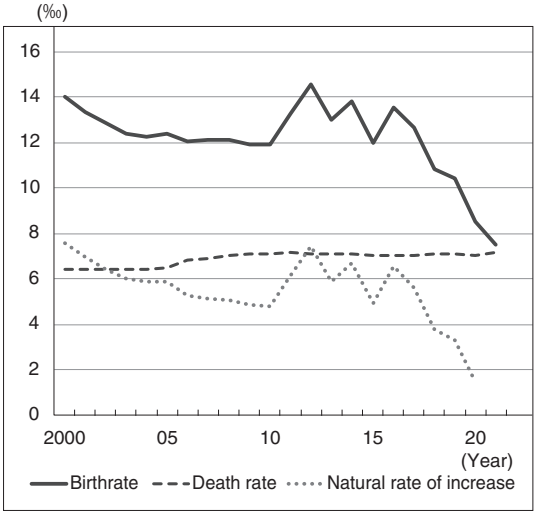
China has been imposing strict control on its residents' movements throughout the COVID-19 pandemic, and as a result, has succeeded in keeping the death toll from the pandemic low and maintaining its general death rates at stable levels. Therefore, the decline in the natural rates of increase can be attributed to a decline in the country's birthrates (Fig. 2). Looking at birthrates in China, the 2021 figure was 7.5‰, and we can see once again that the declines have become substantial since 2017. The number of births in China in 2021 was 10.62 million, which is close to half the number of 18.89 million in 2016 and the lowest figure ever recorded in the country's history. As a result, the natural increase of the Chinese population in 2021, obtained by subtracting the number of deaths from that of births in the year, came to a mere 0.48 million, which was only one-fourth the natural increase of 2.04 million in the previous year. Considering these data, it seems likely that

Fig. 1 Changes in China's population and the natural rate of increase



Notes: The National Population Census was conducted at 10-year intervals, in 2010 and 2020. Each year in between, a sample-based population survey employing a sample of 1% of the national population was conducted.
Source: Prepared by JRI based on data from CEIC

Fig. 2 Changes in China's birthrate, death rate and natural rate of increase



Notes: Natural rate of increase = Birthrate – Death rate
Source: Prepared by JRI based on data from CEIC

China's population will start declining in 2022 as was projected.

China's total fertility rate, which means the average number of children a Chinese woman has during her reproductive years (from 15 to 49 years old), has also been declining. According to the results of the Seventh National Population Census, the total fertility rate in 2020 was 1.30, which is lower than 1.64, the total fertility rate in 2010 when the previous National Population Census was conducted[1], and even lower than that of Japan in 2020, which stood at 1.33. Some scholars in China have suggested that the country's replacement-level fertility rate (the fertility rate that enables the country's population to remain unchanged with no increase or decrease) is 2.02[2]. However, total fertility rates in China since 1992 have all fallen below this figure[3]. Due to the effects of the COVID-19 pandemic, the total fertility rate in 2021 is expected to fall below 1.30 and remain somewhere from 1.10 to 1.20[4]. In World Population Prospects 2022, the United Nations projected the total fertility rate in China in 2021 to be 1.16.

(2) Credibility of National Population Census results

China's National Population Census is a large-scale survey conducted by mobilizing 7 million census takers at 10-year intervals. Despite this, even people in China have been posing questions concerning the credibility of the Census results. One question has to do with the number of babies announced in such censuses. The number of babies is critical figures that determine whether the population will increase or decrease. According to the Seventh National Population Census results, youth population comprising people from zero to 14 years old in China was 253.38 million as of 2020. However, the sum of the number of babies born each year from 2006 through 2020 indicated in the annual statistical data, etc. announced by the National Bureau of Statistics of China came to 238.89 million, which is 14.49 million less than the corresponding figure stated in the Census[5]. In addition, some people have pointed out that the increase in China's population from 2019 to 2020 indicated in the results of the Seventh National Population Census was 12.07 million, which seemed much too large compared to the increase of 3.67 million that took place from 2018 to 2019[6].

Some media outlets in Japan suggested that such differences seen among figures for the population of China's young people from zero to 14 years old may have been the product of "upward window dressing" by the Chinese government to make it look as if the countermeasures it has taken against the declining birthrate are working[7]. However, the National Bureau of Statistics of China has long been in the habit of making retrospective revisions, based on the results of the National Population Census conducted on the entire population once every ten years, to the previously published not-so-accurate data for each year based on the sample-based population survey conducted annually before the relevant Census year. Thus, it is not rare to see a figure for a certain item in the Census results that does not match the figure for the same item derived from past annual statistical data.

Although each of the differences in the figures between the Census results and the annual statistical data from the sample-based population surveys may not be overly significant, even the numbers provided as the population of China as of 2020 are slightly different between the preliminary figures of the National Population Census announced in May 2021, the China Statistical Yearbook 2021 published in June 2021 after the announcement of the National Population Census preliminary figures, and the Chinese Population Census Yearbook 2022 that documented the details of the Census results and that was published in April 2022[8]. There was a difference of as much as 14.49 million between the figure obtained by summing up the numbers of babies born indicated in the annual statistical data for the relevant 14 years and the population of young people aged zero to 14 years indicated in the Seventh National Population Census results. Such a large difference probably stems

from the low accuracy of the annual statistical data based on sample-based population surveys.

In this article, the latest data made available on the most recent date will be used, under the assumption that the data are constantly being revised. However, when comparing populations among provinces, directly governed cities or autonomous regions, the relevant Chinese Population Census Yearbook will be cited, in which a breakdown of the population in provinces, directly governed cities and autonomous regions is provided. Chinese statistical data contain some data of obviously questionable credibility, such as statistics on the GDP of the country's provinces and municipalities (Miura [2013], Kajitani [2018]). Considering that the National Bureau of Statistics of China has also shown a tendency to conceal inconvenient data, as can be seen, for example, in the fact that the Bureau stopped releasing the Gini coefficient, a measure representing income inequality, Chinese statistical data undoubtedly is fraught with many issues. However, China conducts censuses not only on its population but also on its economy and agriculture, and the Chinese government has customarily made retrospective revisions to previously published annual statistical data based on the results of newly published censuses. Therefore, it seems a little too extreme to disregard the National Population Census results altogether due to their low credibility.

(3) Population decline proceeding at a faster pace than expected

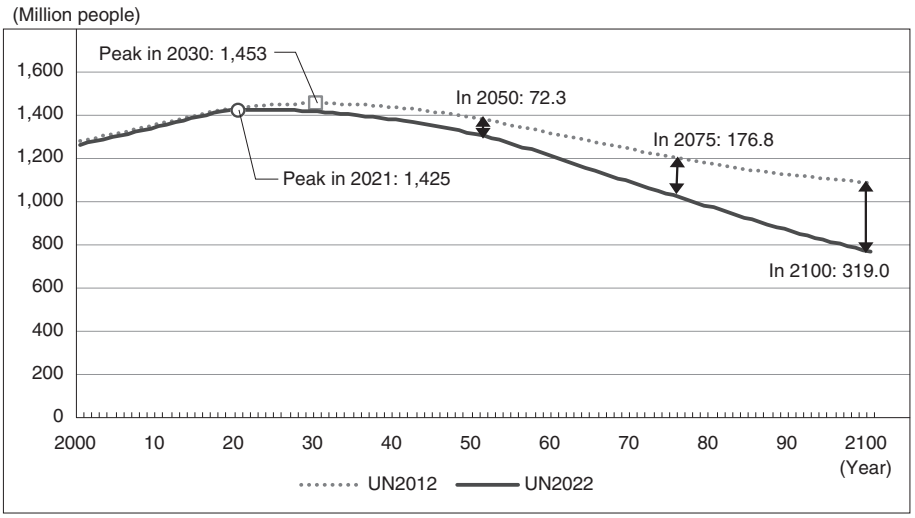
The fact that the population of China has been shrinking at a faster pace than expected can also be observed in the significant revisions made to the figures concerning China's population indicated in the United Nations' World Population Prospects. In the ensuing discussion, we will demonstrate that the population of China has been rapidly decreasing by comparing the figures of the United Nation's World Population Prospects 2012 (hereinafter "UN2012") based on the results of the Sixth National Population Census conducted in 2010 and the figures of the United Nation's World Population Prospects 2022 (hereinafter "UN 2022") based on the results of the Seventh National Population Census conducted in 2020.

The medium-variant projections of UN2012 suggest that the population of China as of 2050, 2075, and 2100 would be 1,384.98 million, 1,205.81 million and 1,085.63 million, respectively. On the other hand, the medium-variant projections of UN2022 indicated that the population of China in 2050, 2075 and 2100 would be 1,212.63 million, 1,029.04 million and 766.67 million, respectively. As shown in these figures, the projected populations as of the same three years (2050, 2075, 2100) decreased by as much as 72.34 million, 176.78 million and 318.96 million, respectively, in only 10 years (Fig. 3). The rates of projected decline as of these three years are -5.2%, -14.7% and -29.4%, respectively, which are rather high even compared to the figures for Japan, i.e., -4.2%, -8.4%, and -12.8%, respectively.

As the population of China decreases as shown in these figures, the ratio of the Chinese population in the world population will also decline. The medium-variant projections of UN2012 indicated that the ratio of the Chinese population in the world population as of 2050, 2075 and 2100 would be 14.5%, 11.6% and 10.0%, respectively. However, the projected ratios for the same three years indicated in UN2022 were 13.5%, 9.9% and 7.4%, respectively. Based on the population projections of India (medium-variant projections) indicated in UN2022, India will overtake China to become the world's most populous country in 2023, and its population as of 2050, 2075 and 2100 is projected to be 1,670.49 million, 1,676.04 million and 1,529.85 million, respectively. Although India's population is projected to reach its peak in 2063, its projected ratios in the world population as of 2050, 2075 and 2100 are 17.2%, 16.2% and 14.8%, respectively, and the gap between the populations of the two countries is expected to widen continuously (Fig. 4).

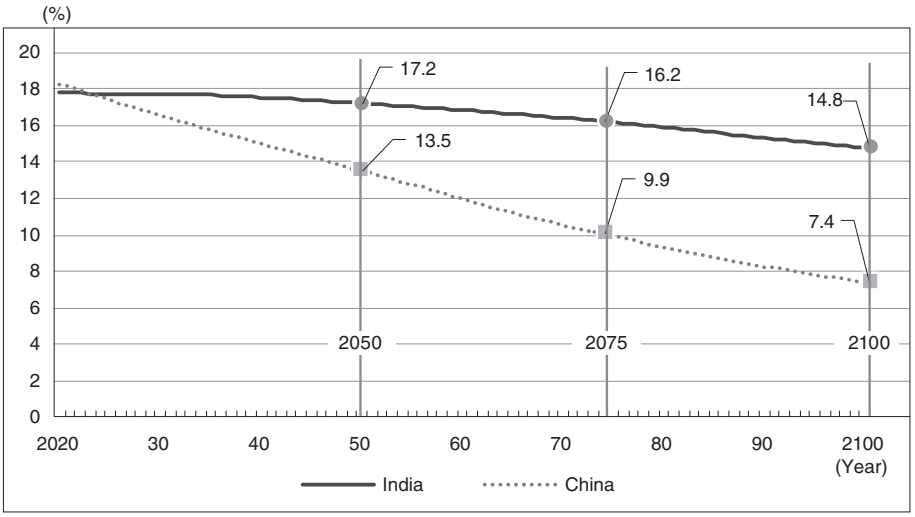
One of the reasons behind the accelerating population decline stems from revisions made to the projected total fertility rates in China. In the medium-variant projections of UN2012, based on

Fig. 3 Changes in the projected population of China in 10 years



Notes: In the medium-variant projections. UN2012 shows projections for the years from 2011, and UN2022 for the years from 2022.
Source: Prepared by JRI based on the United Nations' World Population Prospects 2012/2022

Fig. 4 Changes in the ratios of India and China in the world population

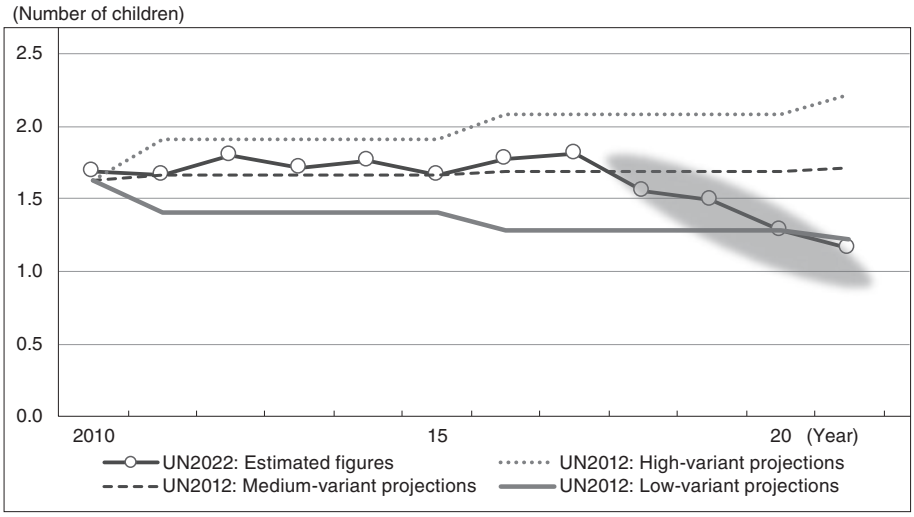


Source: Prepared by JRI based on the United Nations' World Population Prospects 2022

the results of the Sixth National Population Census, the total fertility rate in China was projected to be 1.63 for the period from 2005 through 2010, and thereafter gradually increase to reach 1.72 for the period from 2020 through 2025, and then hit 1.80 for the period from 2040 through 2045 and remain above 1.80 until 2100. However, the medium-variant projections of UN2022 indicated that the total fertility rate in China started declining sharply in 2018 and would become 1.16 in 2021, which is below that of the low-variant projection of UN2012 (Fig. 5)[(9)], and would probably not bounce back to 1.50 even by 2100 (Fig. 6).

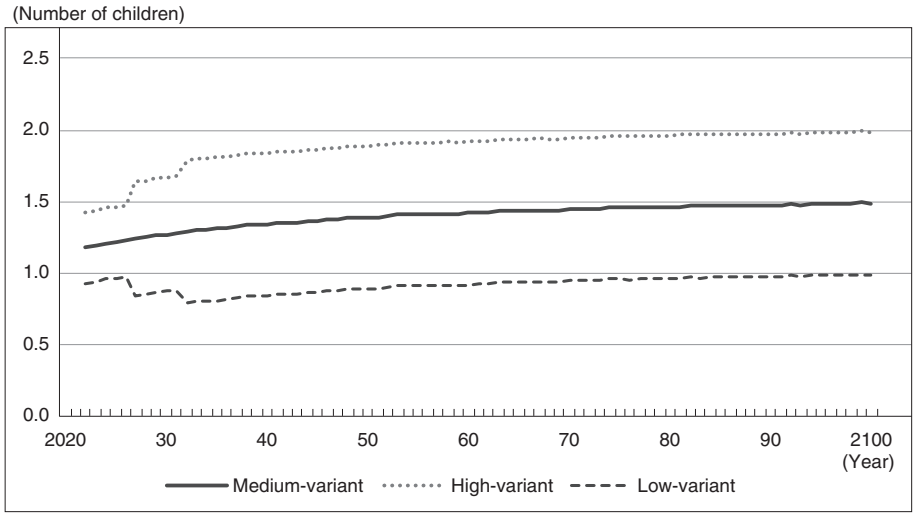
Considering that the total fertility rate was projected to be 1.69 for the period from 2015 through 2020 in the United Nations' World Population Prospects 2019, it is conceivable that the population projections published in UN2022 were cal-

Fig. 5 Total fertility rate projections in UN2012 and estimates in UN2022



Source: Prepared by JRI based on the United Nations' World Population Prospects 2012/2022

Fig. 6 Total fertility rate projections indicated in UN2022



Source: Prepared by JRI based on the United Nations' World Population Prospects 2022

culated by incorporating the successive declines in the total fertility rate of China since 2018 including the data, among all, from the results of the Seventh National Population Census and the sample-based population survey in 2021. It goes without saying that the COVID-19 pandemic contributed to the total fertility rate declines in 2020 and 2021. However, China's total fertility rate had already been declining since 2018. In consideration of this fact, it is also reasonable to assume that the effects of the pandemic on the declines were not very significant.

If this is the case, even if the restrictions on people's movements in China were loosened due to modification of its zero-COVID policy, the country's population should continue to shrink at an accelerated pace. If the decline was to take a trajectory based on the low-variant projections, the total fertility rate would continue to fall below 1.0 and the population as of 2050, 2075 and 2100

would be projected as 1,215.68 million, 837.52 million and 487.93 million, respectively. These figures are far below the medium-variant projections presented in UN2022 shown in Fig. 3—specifically, 96.96 million less, 191.51 million less and 278.75 million less than the medium-variant projections of UN2022 in 2050, 2075 and 2100, respectively. Compared to the medium-variant projections indicated in UN2012, it is 169.30 million less, 368.29 million less and 597.70 million less in 2050, 2075 and 2100, respectively. As can be seen, the decline in the country's total fertility rates since 2018 had a massive impact on the long-term population projections of China.

(4) An increasing number of people in China are expressing pessimistic views

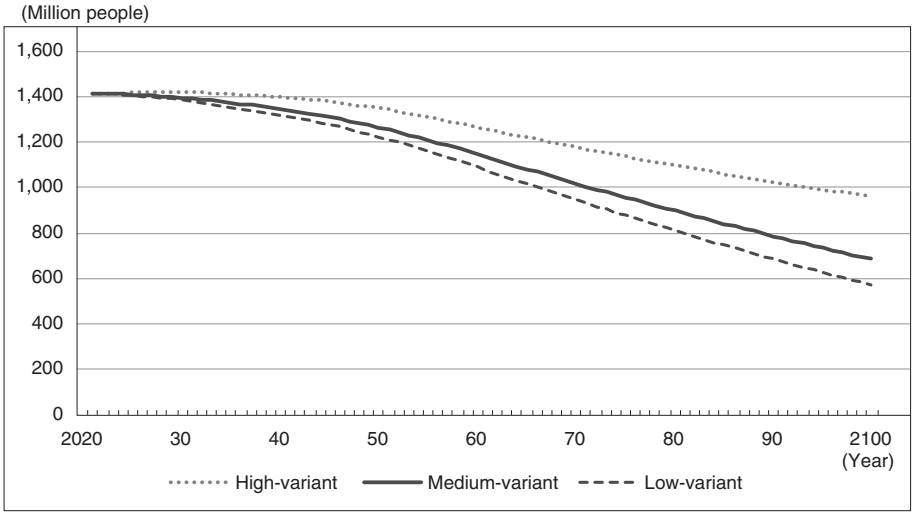
The population prospects presented within China had been rather optimistic in the past. For example, the Institute of Population and Labor Economics of the Chinese Academy of Social Sciences, a governmental think tank in China, forecast in the Green Book of Population and Labor: Reports on China's Population and Labor No.22 published in January 2019 that China's population would reach a peak of 1,440 million in 2029, and even if the country's total fertility rate remained low at 1.6, the peak year would be two or so years earlier than the originally projected peak year of 2029[10]. This is six to eight years later than the projected peak year of 2021 indicated in the medium-variant projections of UN2022. At first glance, these differences among the projected peak years may seem insignificant, but they would bring about a major impact in the long run. Such optimistic projections suggest that, within the Chinese government, there was little sense of urgency over the country's population decline.

Following the release of the results of the Seventh National Population Census, even within China, the previous optimistic views on the country's population prospects have receded, and instead, pessimistic views have become rampant. In response to the decline in the total fertility rate of 2020 to 1.30, YuWa Population Research Institute, a non-profit organization specialized in public policy-related research, released in the *2021 China Population Projection Report*, published at the end of 2021, its population estimates through year 2100 comprising (1) the high-variant projections based on the scenario that the rate would bounce back to 1.6, (2) the medium-variant projections based on the scenario that the rate would remain at 1.2, and (3) the low-variant projections based on the scenario that the rate would fall further to 1.0 (Fig. 7).

In the medium-variant projections published in the Report, China's population is projected to be 1,264.45 million, 955.81 million and 684.50 million in 2050, 2075 and 2100, respectively. Because the *2021 China Population Projection Report* was published at the end of 2021, it is conceived to have not been impacted by the results of UN2022 released in July 2022 and of the sample-based population survey for 2021 released in January 2022[11]. Despite this, the projected population figures released in the Report for 2050, 2075 and 2100 were 48.19 million less, 73.23 million less and 82.17 million less, respectively, than the medium-variant projections of UN2022. This fact indicates that the decline in the country's total fertility rate revealed in the Seventh National Population Census results impacted the population projections released thereafter.

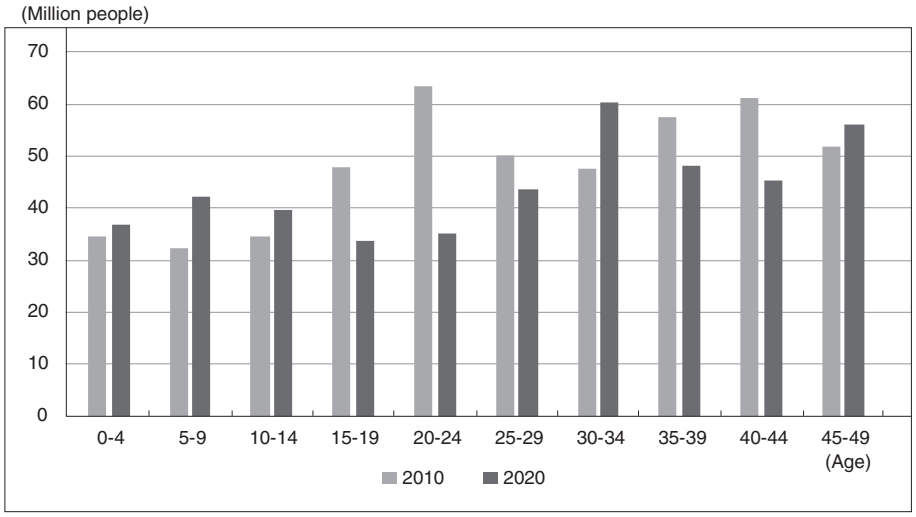
The population projections indicated in the *2021 China Population Projection Report* were also impacted by the decline in the population of women of reproductive age. Looking at the number of women of reproductive age (from 15 to 49 years old), whose figures are used for calculating the country's total fertility rates in the National Population Censuses, the number was 322.29 million in 2020, which was 57.49 million less than the population in 2010 of 379.78 million. Of women in this age group, the population of those from 20 to 29 years old decreased by as many as 36.30 million (from 113.58 million in 2010 to 78.95 million in 2020). As can be seen in these figures, the declines in the country's total fertility rate and the population of reproductive-age

Fig. 7 Population projections released in China after the Seventh National Population Census



Source: Prepared by JRI based on local press materials

Fig. 8 Population of women in China by age group



Notes: Age groups of 50 years old or older are omitted.
Source: Prepared by JRI based on data from the National Bureau of Statistics of China (2012, 2022)

women are two major factors that are accelerating China's shrinking population trend.

If we look at the population of women in China by age group, the numbers of women in the age groups of 30 to 34 years old, 10 to 14 years old, 5 to 9 years old, and zero to 4 years old in 2020 were higher than those in 2010, meaning that the population of Chinese women had not decreased across all age groups (Fig. 8). However, the numbers of Chinese women in the age groups of 25 to 29 years old, 20 to 24 years old and 15 to 19 years old in 2020 were substantially lower than those in 2010. In particular, the number of the women from 20 to 24 years old in 2020 was a mere 35.27 million, roughly half the number of women in the same age group in 2010, which stood at 63.40 million. In China, the mean age at first marriage is 28 years old and the mean age at first birth is 29 years old[12], which are almost the same as those in Japan in 2009[13]. Thus, if China fails to increase

the country's total fertility rate significantly in the next 15 years, during which time the women currently in the 15- to 19-year-old age group will become 30 to 34 years old, China will see a decline in the number of women of reproductive age directly result in a decline in the overall population.

2. Irreversible acceleration of the declining birthrate

What is the context behind the declining birthrate? In this section, we will explore its causes. We will also elucidate how the focus of China's measures against the declining birthrate has shifted from easing the restriction on the number of childbirths to encouraging childbirth, verify the results of such measures, and look at the prospect of how China's population will transition.

(1) Causes of the declining birthrate: Urbanization and popularization of higher education

In China, various discussions have taken place on the causes of the declining birthrate based on cases in Japan and other countries. While there is an increasing argument that the declining birthrate will have a serious impact on the Chinese economy, such as a slowdown in economic growth and the deterioration of pension finance (Chen, Xu, Tang, Gao [2021]), there is also a view that, given that it is an unavoidable phenomenon common to many countries that have achieved economic development, it is difficult to fundamentally solve this issue. In January 2022, the National Bureau of Statistics of China indicated the following three reasons as the causes of the birthrate decline: 1) a decrease in the population of women of reproductive age (aforementioned Fig. 8), 2) a change in the mindset of people who will be entering the life stage of getting married and having children, such as the tendency to marry later in life and less desire to have children, and 3) postponement of marriage and childbearing due to the spread of COVID-19[14].

Two of the causes which have a prospect of being addressed by government policies are the change in the mindset of young people, such as the tendency to marry later in life and less desire to have children, and the postponement of marriage and childbearing due to the spread of COVID-19. For the latter cause, it was clearly indicated during the 20th National Congress of the Communist Party of China held in October 2022 that the zero-COVID policy, which imposed strict movement restrictions, was to be firmly maintained. However, the zero-COVID policy was starting to fail[15], and protest demonstrations against the restrictions occurred one after another. In response, the government came up with a policy in December 2022 to relax the restrictions by taking measures such as no longer requiring negative test result certificates except for schools and medical facilities, allowing home quarantine of those who tested positive, and discontinuing the operation of its movement tracking app[16].

This means that the Xi Jinping administration changed the policy it announced at the National Congress of the Communist Party of China in just one month. If China continues to maintain this revised policy, it will contribute to the recovery of not only the Chinese economy but also the country's birthrate. The Chinese Academy of Social Sciences, which is a Chinese state think tank, indicated in its *2023 Analysis and Outlook of the Economic Situation in China* published in December 2022 that the growth rate will recover to 5.1% in 2023 as personal consumption will regain momentum due to the easing of movement restrictions[17]. The government also mentioned at the Central Economic Work Conference in which the country's economic operation policy for 2023 was discussed that it will boost its economy by implementing powerful financial and monetary policies[18].

However, it is still premature to say that the country's economy will recover linearly and the birthrate will increase with the easing of restrictions. The vaccines used in China are less effec-

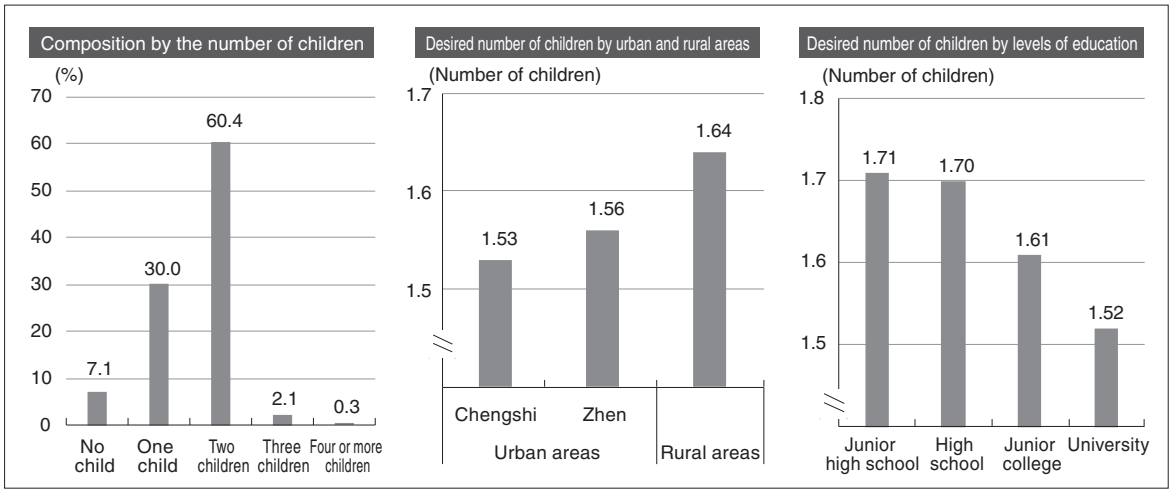
tive as they are the older generations of inactivated vaccines. In addition, the vaccination rates of the elderly population are estimated at 86% for people aged 60 and older and 65% for people aged 80 and older as of the end of November 2022[19]. Consequently, there is a risk that the country's medical system will start to collapse and the death toll will rise as the number of new infections increases. In such a case, people will voluntarily suppress their movement even if no restrictions are imposed on them, and therefore the declining birthrate due to the spread of COVID-19 will be considered a phenomenon that is specific to China.

Also, the mindset of young people such as the tendency to marry later in life and less desire to have children is unlikely to change easily. According to the Seventh National Population Census, the average age of marriage in 2020 was 29.38 years old for men and 27.95 years old for women, falling behind 3.63 years and 3.95 years, respectively, from 2010. The tendency to get married later in life will likely lead to "delayed childbearing" where women give birth to their first child at the age of 35 or older. This gives rise to a decline in the birthrate caused by a decline in the pregnancy rate. Japan experienced a shifting of the peak of its birthrate by age group in 1990s, as the birthrate among people in their 20s significantly declined and the birthrate among people in their 30s increased (Cabinet Office [2015]). China is now experiencing the same situation.

There is also a notable decline in the desire to have children. In a study conducted by Fudan University and other institutions in June 2020, the number of people who considered "two children" as the "ideal number of children" was the highest, accounting for 60.4% of the total responses, followed by "one child" which accounted for 30.0%, and "no children" which accounted for 7.1% (left graph in Fig. 9), and the average ideal number of children was 1.59[20]. In a similar study conducted in 2013, the average ideal number of children was 1.93, indicating that the number has declined by 0.34 in just seven years.

The total fertility rate in 2020, which was 1.30, falls below the average ideal number of children (1.59). This indicates that childbearing and child-raising generations are faced with a situation where they cannot have children according to their ideal scenarios due to rising housing prices and educational expenses. According to NUMBEO, which conducts research on the quality of life across the world, China's ratio of property price to income for 2022 mid-year was 38.4 times,

Fig. 9 Results of survey on the "ideal number of children" (2020)



Notes: The number of valid responses was 6,139. For urban areas, "Chengshi" means areas where secondary and tertiary industries are concentrated, and "Zhen" means areas where secondary and tertiary industries are the main industries, but less concentrated than "Chengshi."
Source: Prepared by JRI based on local press materials

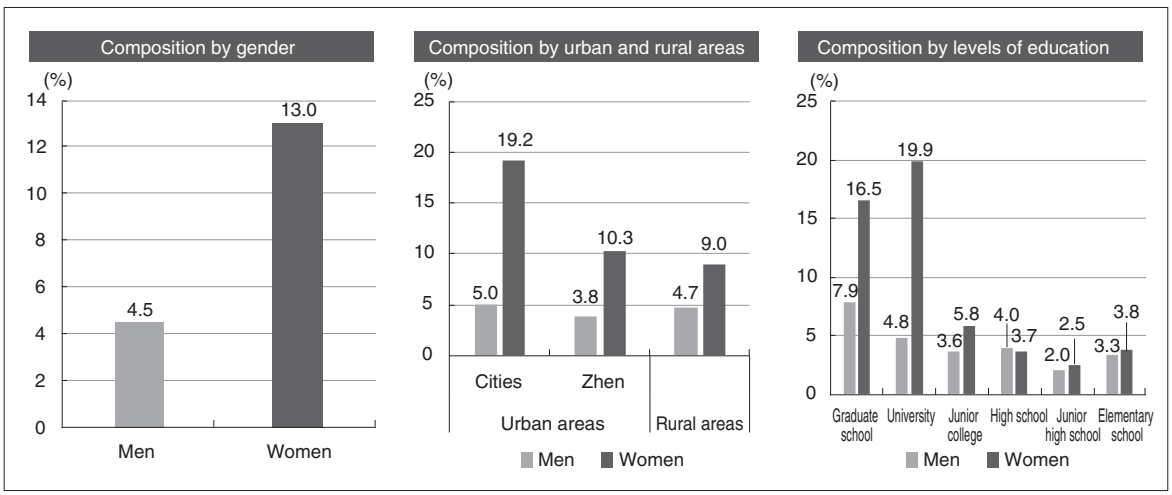
which is significantly higher than Japan's ratio of 10.5 times, indicating that the burden of buying a house in China is one of the heaviest in the world. Further, according to the *Report on Cost of Raising Children in China 2022* published by YuWa Population Research Institute, the average cost of raising a child until the age of 17 is 485,000 yuan, and the said cost until the child graduates from university is 627,000 yuan[21]. The former is equivalent of four years' worth of the average disposable income in urban areas, and the latter is equivalent of 5.2 years' worth, also indicating it is one of the highest levels in the world.

The study conducted by Fudan University shows that urbanization and popularization of higher education are facilitating changes in lifestyles and values, inducing a lower birthrate. The ideal number of children in "Chengshi," which refers to the central parts of urban areas, was 1.53, lower than the 1.64 in rural areas (middle graph in Fig. 9). Also, the ideal number of children for people who graduated from university was 1.52, which is lower than 1.71 for people whose final academic background is junior high school (right graph in Fig. 9). Above all, the change in the mindset of women has a large impact on the decline in the total fertility rate. The percentage of women who stated that they "have no plans to have children" was 13.0%, which is 2.8 times more than men (4.5%) (left graph in Fig. 10). It also shows that women in urban areas are more reluctant to have children than women in rural areas, as are women with higher educational attainment compared to women with lower levels of education (middle and right graphs in Figu. 10).

With the rise of a career-oriented mindset resulting from the popularization of higher education, increasingly more women feel that a long-term leave from work for childbirth will have a negative effect on their career development. Even if those women accept that negative effect and decide to have children, they will still face a problem of who will do the child-rearing and household chores. Because China does not have a childcare leave system like Japan[22], many people who want to have children give up on doing so because it is difficult to balance work with having and raising children.

One of the questions in Fudan University's study asked respondents who the main bearer of housework including child-rearing was, and the most common answer was "My parents or my spouse's parents" (51.2%), which was higher than "Only ourselves (husband and wife)" (33.0%).

Fig. 10 Gender breakdown of those who responded they have "no plans to have children" (2020)



Notes: Same as Fig. 9
Source: Prepared by JRI based on local press materials

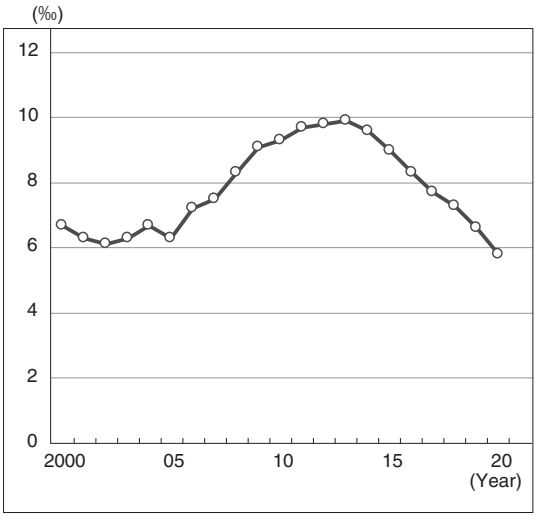
According to the Organisation for Economic Co-operation and Development (OECD), China's labor force participation rate for women was 60.6% in 2019, which is higher than Japan's 53.6%. On the other hand, the unemployment rate for young people (between the ages of 16 and 24) was at a record high of 19.9% in July 2022. The deterioration of the employment environment caused by a slowdown in economic growth will likely have a downward effect on the total fertility rate.

For people who are considering whether or not to have children, their parents are the biggest source of help for child-rearing households. However, they are also a source of worry. This is because there are quite a few people who choose not to have children in anticipation of caring for their parents. It has been 43 years since the One-child Policy was adopted in 1979. As a result of this policy, households with the "4-2-1" family structure increased. The 4-2-1 structure means that a married couple has four parents above them and one child below them, symbolizing the heavy care burden on the working generation. Many people worry if they will be able to have a child while taking care of four parents.

In China, the fact that increasingly more women do not wish to get married is viewed as problematic. According to the *Report on Marriage and Family in China 2022* published by YuWa Population Research Institute, the country's marriage rate—which indicates the ratio of people who are married per 1,000 people—dropped to the lowest level in 20 years to 5.8‰ in 2020 (Fig. 11). While this is believed to be affected by the decrease in the population of women of marrying age, we cannot overlook the fact that women's perspectives on marriage is changing.

According to a study conducted in 2021 by Communist Party subordinate organization the Communist Youth League of China which targeted 2,905 young people between the ages of 18 and 26 who live in urban areas, women who responded that they "will not marry" or "undecided" to the question "Do you intend to get married in the future?" reached 43.9%, far exceeding the ratio of men who chose the same answer (19.3%)[23]. A study conducted in Europe was introduced and gained attention, as it showed that the level of happiness for women who do not get married or give birth is higher than that for women who experienced those things[24]. In China, some also point out that "traditional values, such as 'happiness comes from getting married and having children,' are becoming a thing of the past."

Fig. 11 Transition of marriage rate in China



Source: Prepared by JRI based on local press materials

(2) Transformation of measures against the declining birthrate—From relaxation to promotion

As the Xi Jinping administration felt a heightened sense of concern over the country's birthrate—which was declining at a pace faster than expected—the administration abolished its One-child Policy at the end of 2015 and allowed married couples to have two children[25], and in June 2016, it implemented a policy which allows married couples to have up to three children[26]. The One-child Policy restricted the number of children a married couple can have to only one child, and the government provided a monthly subsidy to households with one child, and/or gave a reward to parents upon retirement at mandatory retirement age[27]. On the other hand, the government

imposed a "social support fee," which was practically a fine on households that did not follow the policy[28]. The amount of the social support fee varies by area, but in the case of Beijing City, the fee was very large, which is estimated to be 3 to 10 times the annual disposable income[29].

As the number of children that families can have has increased, families with three children or less are no longer subject to the fine. However, this does not mean that the fine for violating the policy is abolished[30]. Also, subsidies and rewards continue to be paid to households that have been following the One-child Policy. Considering the fact that the total fertility rate for 2020 was 1.30, a policy that allows families to have three children means the government has lifted its birth control rule, but it has not renounced the rule. Some media point out that the reason for this is that the government intends to control the population of ethnic minorities[31].

The focus of the measures against the declining birthrate is shifting from simply relaxing the birth control rules to encouraging childbirth. This was systemized in the *Decision Regarding the Optimization of the Childbirth Policy and the Promotion of Developing a Balanced Population Over a Long Term*[32] made in July 2021, in which the Communist Party and the State Council (the government) allowed families to have three children (hereinafter referred to as the "Decision"), and the Population and Family Planning Law which was revised in August[33] following the Decision. The Decision stated that the childbirth policy needs to be reviewed in order to maintain human resources and domestic demand that support the development of a high-quality, high-volume economy, and that the government will solve issues surrounding marriage, childbirth, child-rearing and education by meeting the diverse needs of its citizens.

In the Decision, the government clearly indicated the timeline for measures against the birthrate decline and goals to be achieved. It also stated that the government will establish a policy system that supports childbirth by 2025, significantly reduce costs related to childbirth, child-rearing and education, boost the birthrate, establish policies and regulations to promote balanced development over a long term by 2035, and improve the population structure. The government positioned the measures against the declining birthrate as a policy issue that should be addressed over 13 years.

Specific policy topics the government mentioned included 1) achieving elderly care and child care which enables a balance between elderly care and childbirth/child-rearing, 2) enhancing reproductive health services such as increasing obstetrics and gynecology clinics and pediatric hospitals, 3) building childcare service facilities, such as kindergartens, by allocating a budget, 4) enhancing the childbirth leave system and adopting a childcare leave system, 5) easing the burden of childbirth-related expenses through the utilization of public medical insurance, 6) commencing research on incorporating expenses related to raising infants and toddlers into personal income tax deductions, 7) prioritizing the allocation of public rental housing based on the number of children, 8) extending the schooltime for pre-school education and compulsory education, thereby reducing the dependence on out-of-school education such as "cram schools," 9) encouraging companies to create an environment that allows employees to feel comfortable having and raising children, 10) considering adoption of a parent-care leave system which allows an only child to care for their parents, and 11) reinforcing the guidance by the Communist Party.

The policy topic to which local governments reacted the quickest was the extension of childbirth leave. While the childbirth leave defined by the central government is 98 days, local governments added 60 to 90 days extra. For example, Beijing City and Shanghai City provide 158-day leave, and Guangdong Province provides 178-day leave[34]. Zhejiang Province came up with a creative system to encourage people to have multiple children by allowing a 158-day leave for the first child, and a 188-day leave for the second and third child[35]. In addition, many local governments have established a childcare system which allows each of the parents with a child under three years old to take five to 10 days of leave in a year.

In July 2022, the Decision was reinforced by the *Guiding Opinions on Further Improvement*

and Implementation of Active Childbirth Support Measures (hereinafter referred to as the "Opinions"), which were jointly issued by 17 departments such as the National Health Commission and the National Development and Reform Commission. While many parts of the Opinions overlap with the Decision, the Opinions stated that the government will holistically consider marriage, childbirth, child-rearing and education and implement active support measures in the areas of finance, tax, insurance, education and housing, and revealed a policy that addresses issues which were not mentioned in the Decision.

Specific policy topics included 1) reducing the operational cost of childcare services such as kindergarten through subsidies, 2) encouraging qualifying gig economy workers to enroll in Urban Workers' Medical Insurance[(36)], 3) encouraging people out of work to enroll in Urban and Rural Resident Basic Medical Insurance[(37)], 4) providing preferential loans through the public housing provident fund set aside by employees and their employers for house purchasing, 5) providing subsidies for pre-school education to economically disadvantaged families, 6) reinforcing finance support for enhancing after-school education, and 7) conducting research on gender discrimination in the workplace and improving the work environment based on the results of the research.

Also, the Opinions revealed that more extensive measures will be taken against some of the issues that were mentioned in the Decision. For example, while the Decision stated that the government will "commence research" on incorporating expenses related to raising infants and toddlers into personal income tax deduction, it was changed to "implement" in the Opinions. In addition, while the leadership only imposed a reporting requirement on local governments by stating that they "must report their population policy for the region to the Central Committee of the Communist Party and the State Council every year," the Opinions promote more independent efforts by stating that "the importance and urgency of childbirth support measures need to be understood in-depth, and the improvement of such measures needs to be accelerated."

(3) Verification of the results of measures against the birthrate decline

While the number of births by the order of child varies across the country as the government does not announce a definitive figure, the number of births of second children in 2016 increased by 33.0% from the previous year to 10.15 million children, which was higher than the number of births of first children. This implies that the abolition of the One-child Policy at the end of 2015 produced some results (Table 1). However, the

Table 1 Breakdown of birth population by the order of birth

Year	First child		Second child		Third child or later		Total	
	10 thousand people	%	10 thousand people	%	10 thousand people	%	10 thousand people	%
2013	924	52.0	679	38.2	174	9.8	1,777	100.0
2014	916	48.3	795	41.9	186	9.8	1,897	100.0
2015	713	43.1	763	46.1	179	10.8	1,655	100.0
2016	697	37.1	1,015	54.0	169	9.0	1,881	100.0
2017	755	42.8	870	49.3	139	7.9	1,764	100.0
2018	643	42.2	734	48.2	145	9.5	1,522	100.0
2019	621	42.4	684	46.7	161	11.0	1,466	100.0
2020	521	43.2	536	44.4	149	12.4	1,206	100.0
2021	457	43.0	457	43.0	148	13.9	1,062	100.0

Notes: Figures for 2021 are estimates by local media, which were calculated by compiling the materials of the National Bureau of Statistics of China and the National Health Commission.
Source: Prepared by JRI based on local press materials

number of births of second children increased in 2014 as well. This was due to the Separate Two-child Policy that had started in 2014. The Separate Two-child Policy allowed parents to have two children if one of the parents is a single child[38], and it was distinguished from the Universal Two-child Policy implemented at the end of 2015.

However, the effect of the Universal Two-child Policy did not last long. The number of births of second children started to decline in 2017, and the ratio to the total number of births has also declined. According to UN2022, there is no evidence that shows a sharp decline in the population of women in the age between 15 and 49, which is used as the basis for calculating the total fertility rate, during the period in Table 1. This clearly indicates that the effect of the Universal Two-child Policy has dissipated. The extent of the decrease in the number of births of second children in 2017 onwards was larger than that of first children, suggesting it was one of the factors that contributed to the declining birthrate.

According to the results of the 2019 National Population and Family Demographics Survey revealed by the National Health Commission, the top reasons for not having a second child were 1) the financial burden is large (75.1%), 2) there is no one who can look after the child (51.3%), and 3) treatment by the employer deteriorates after taking the childbirth leave (34.3%) (multiple answers allowed). Although the Universal Two-child Policy was not ineffective, it did not address the concerns of those who plan to have children, and therefore did not have the effect of intermittently increasing the number of births of second children.

The National Health Commission did not adequately understand this issue, and it was optimistic about the effectiveness of the Universal Two-child Policy when the policy was introduced in 2016, forecasting that the trend of population increase would grow greatly and that the population would reach its peak in 2030[39]. As a result, China was late to implement measures against the declining birthrate. While some insisted on abolishing the One-child Policy in 2011[40], it took four years to actualize it. Further, it took another five and a half years to make the Decision to allow families to have three children.

The effect of the Decision will start to appear in 2022. Nonetheless, it is unlikely to be a strong effect, as the ratio of third children to total births is a little over 10% to begin with, and the birthrate and the total fertility rate are on a downward trend as illustrated in the aforementioned Fig. 1 and 4.

On the other hand, the Opinions include a "solid shot" of cash benefits for families with children, and therefore some say there will be a change that has never been seen before. In fact, some cities are starting to allocate their budget to measures against the declining birthrate. In 2021, Panzhihua City in Sichuan Province provided a monthly subsidy of 500 yuan per child up to the age of three for households with multiple children. As a result, its birthrate increased by 1.62% from the previous year, and the birthrates of second children and third children increased by 5.6% and 168.4%, respectively[41]. Panzhihua City provided a subsidy in the amount of 950 thousand yuan in total in 2021, and it plans to increase the amount by 10 times to 10 million yuan in 2022.

Moreover, Hengshui City in Hebei Province came up with support measures[42] in November 2022, such as 1) providing a subsidy for fertility treatment (up to 10,000 yuan), 2) providing a subsidy for births of second children (5,000 yuan), and 3) providing a subsidy for supplementing the cost of raising infants and toddlers under the age of three (300 yuan per month for the first child, 500 yuan per month for the second child, and 800–1,200 yuan per month for the third child). As the population of Hengshui City has decreased for two consecutive years, by 6.3% in 2020 and by 0.5% in 2021 from the previous year, respectively, the city expects to turn the rate of population growth positive by providing subsidies for childbirth and child-rearing.

However, measures such as the provision of subsidies and extension of childbirth leave will not have an impact large enough to stimulate the desire to have children, and they will not be a winning formula to stop the decline in the birthrate for the following reasons.

First of all, the amount and period of subsidies are limited and considered insufficient. The child-

care subsidy provided by Panzhihua City in Sichuan Province is 6,000 yuan per year. This is not a small amount as it is the equivalent of 12.5% of the city's disposable income in urban areas, which is 47,915 yuan. Changsha City in Hunan Province attracted attention when it announced in October 2022 that it would provide 10,000 yuan as a childcare subsidy for third children. However, because it is a one-time payment, the amount is actually smaller than the subsidy of Panzhihua City in Sichuan Province which is provided until the child turns three. On the Internet, the subsidy of Changsha City was criticized as insufficient to persuade people to have children, as the amount of subsidy was smaller than the educational expenses for one year[43]. The childcare subsidy of Panzhihua City in Sichuan Province faces the same issue.

There is no doubt that the childcare subsidy will lessen the financial burden on households. However, it does not address the concern of raising money for educational expenses, which reach 627 thousand yuan by the time a child graduates from university. While the Opinions stated that the government would holistically consider marriage, childbirth, child-rearing and education, many of the subsidies are targeting children up to the age of three, and do not cover educational expenses after that (Table 2). Although the Ministry of Education started to work on reducing out-of-school educational expenses in July 2021 by turning cram schools into nonprofit entities[44], the educational expenditure by households (including cultural and entertainment expenditures) for the same year increased by 27.9% from the previous year instead of decreasing.

While childcare subsidies are gaining attention as a new measure against the declining birthrate, if we look at the financial scale, it is doubtful if local governments are taking the matter seriously. While Panzhihua City has been introduced as a successful case for achieving results by providing a subsidy, the subsidy of 950 thousand yuan is only 0.006% of its fiscal expenditure. Even if the city increases the budget by 10 times in 2022, it is difficult to suggest that the city is being aggressive toward providing subsidies.

Secondly, there are only a few local governments that provide housing purchase subsidies. Jiaxing City in Zhejiang Province provides a subsidy of 300 yuan per square meter (up to 50,000 yuan) for households with two children and a subsidy of 500 yuan per square meter (up to 100,000 yuan) for households with three children when they purchase a newly built house. However, if we assume the floor space of a house to be 100 square meters, then the average price of a house in the city would be 1.32 million yuan[45]. We cannot possibly think that this subsidy will become a catalyst for having multiple children.

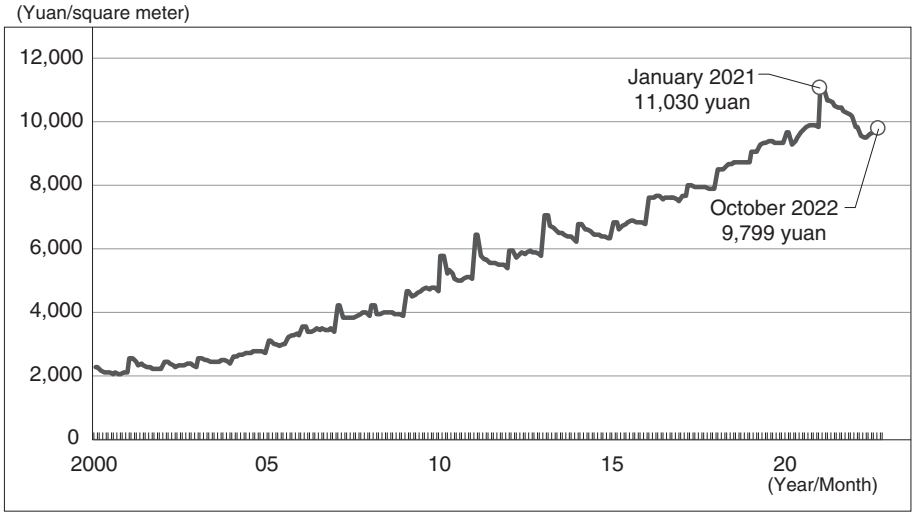
Housing prices in China are still high. The national average of housing prices fell in 2021 due to the "Three Red Lines" (Miura [2021]) which specify regulations on the total volume of banks' real estate lending and debt reduction targets for

Table 2 Breakdown of the cost of raising a child from birth to graduation from university

Period	Expenditure (yuan)	Total (yuan)	Composition (%)
Expenses during pregnancy	10,000	10,000	1.6
Expenses for delivering a child	15,000	15,000	2.4
Zero to two years	Annual average of 21,559	64,677	10.3
Birth to two years	—	89,677	14.3
Three to five years	Annual average of 33,559	100,677	16.1
Six to 14 years	Annual average of 24,072	216,648	34.5
15 to 17 years	Annual average of 26,072	78,216	12.5
Birth to 17 years	—	395,541	63.1
18 to 22 years	Annual average of 35,500	52,323	8.3
Birth to 22 years	—	627,218	100.0

Source: Prepared by JRI based on local press materials

Fig. 12 Transition of housing prices (national average)



Source: Prepared by JRI based on data from CEIC

real estate developers (Fig. 12). Still, the prices have not dropped to a point where they will drastically reduce the burden of mortgage loans. In China, people generally need to cover a down payment of one million to two million yuan, and make monthly repayments of loan in the amount of 10 thousand to 20 thousand yuan.

The Xi Jinping administration introduced a concept called "common prosperity," by which it will reduce housing prices and enable all citizens to feel prosperous (Miura [2022]). Although we believe this will also be effective as a measure against the declining birthrate, the government is busy supporting housing prices and implementing relief measures for property developers that are suffering from poor business performance, as there are concerns over the collapse of a real estate bubble. The Xi Jinping administration is being forced to choose between putting a stop to the birthrate decline or preventing the collapse of a real estate bubble, and it is prioritizing the latter from the perspective of preventing economic instability.

Establishment of public rental housing for mid- to low-income households, which is referred to as security housing, is also not progressing. Even though the Opinions state that households with multiple children are given priority for moving into security housing, the number of security housing units constructed in 2021 was 940,000[46], which is one sixth of 6.47 million general housing units. The government plans to build 8.70 million security housing units during the period of the 14th Five-year Plan (2021–2025)[47], but the plan is already faced with an obstacle. In China, since people often seek to own a house as a means to build assets, it is hard to direct funds to low-profit rental housing.

The third reason is that subsidy programs are not spreading widely. The Opinions spurred local governments by stating that "the importance and urgency of childbirth support measures need to be understood in-depth, and the improvement of such measures needs to be accelerated." However, subsidy programs for childbirth, child-rearing and housing purchases have not spread widely. The only first-level administrative divisions that have implemented such programs are Beijing City, Guangdong Province and Jiangsu Province, and prefecture-level cities equivalent to second-level administrative divisions that have implemented such programs so far are Changsha City in Hunan Province, Harbin City in Heilongjiang Province, Songyuan City in Jilin Province, Ningshan County in Shaanxi Province, Wenzhou City in Zhejiang Province, Linze County in Gansu Province, and Jiaxing City in Zhejiang Province[48].

The background to this is that local govern-

ments are facing financial difficulties due to decreased income from the transfer of land-use rights resulting from falling housing prices. Income from transfer of land-use rights is the largest income source for local governments, accounting for 40% of their revenue. However, with the deteriorating performance of real estate developers, income from transfer of land-use rights from January to October 2022 decreased by 25.9% year-on-year to 4,402.7 billion yuan (Fig. 13). As income from transfer of land-use rights is expected to further decrease in the future, local governments are not capable of putting a large budget towards measures against the declining birthrate.

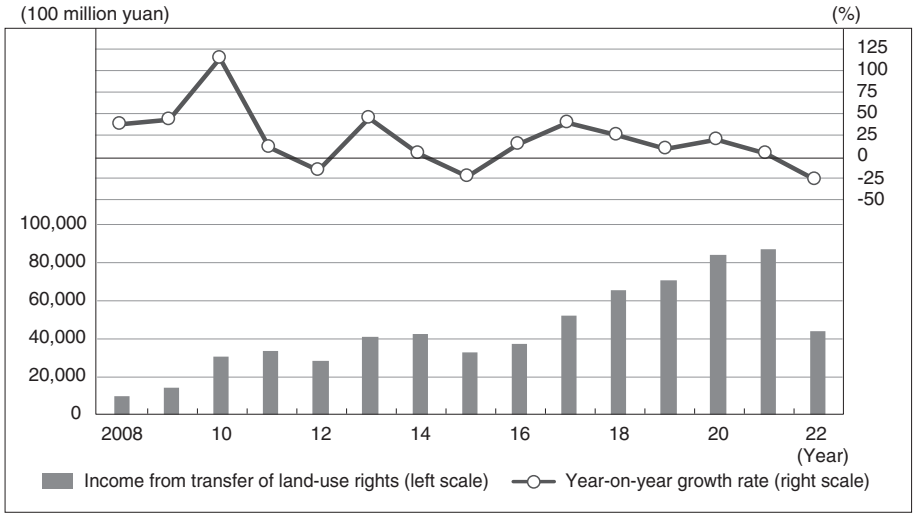
Economist Ren Zeping, who actively talks about the issue of declining birthrate, gained attention when he proposed 1) providing 1,000 yuan as a monthly childcare subsidy until children reach adulthood instead of three years old, and 2) cutting interest charges by half for households with second children and waiving the entire interest charges for households with third children[(49)]. However, local governments do not have the financial resources to implement such measures.

The fourth reason is that people believe the extension of childbirth leave and adoption of a childcare leave system will exacerbate the employment situation for women. Although the intended purpose of these measures is to enable people to balance childbirth/child-rearing and work, they may induce companies to avoid hiring women of childbearing age who may be away from work for a long term. This creates a concern that there will be more women without the opportunity to have children or women who decide not to have children[(50)]. The government and companies are in uncharted territory when it comes to identifying unfair discrimination against women and ways to monitor and correct such discrimination.

(4) Outlook: The possibility of population transitioning close to the low-variant projections

It seems that China will not be able to reduce the burden of education and housing, or dispel the concern that being away from work for childbirth and child-rearing will have a negative impact on the career formation of women. In the meantime, the population of women of reproductive age will

Fig. 13 Transition of income from transfer of land-use rights and year-on-year growth rate



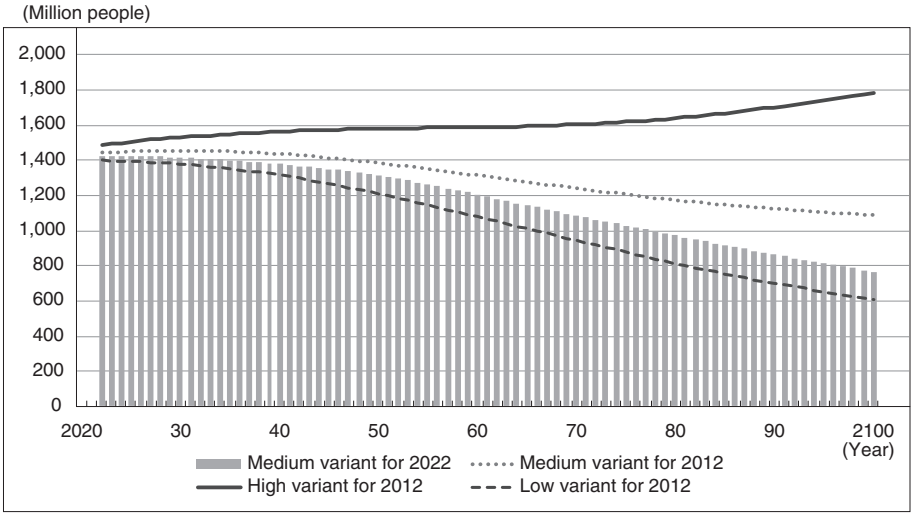
Notes: The figures for 2022 are for the period from January to October.
Source: Prepared by JRI based on the materials of the Ministry of Finance of the People's Republic of China

decrease and the marriage rate is expected to drop further, so the population may transition lower than the medium-variant projections indicated in UN2022 and closer to the low-variant projections.

In fact, among the medium, high, and low variants indicated in UN2012, the low variant was closest to the medium variant in 2022 (Fig. 14), indicating that the low variant is not necessarily a rare occurrence. In such case, the population of China will fall below one billion people in 2065, and below 0.5 billion people in 2100 (Fig. 15).

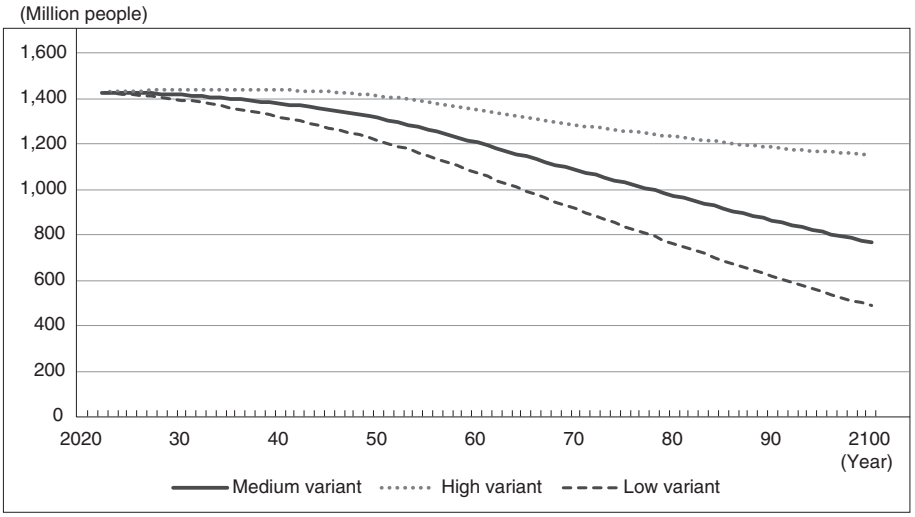
The Chinese government is using the policies of Japan and Korea, which are also struggling with declining birthrates, as reference. However, the unemployment of young people (15–24 years old) in China is 14.3% in 2021, which is higher than

Fig. 14 Three patterns of China's population demographics based on the 2012 forecast by the UN and medium-variant projections for 2022



Source: Prepared by JRI based on the United Nations' World Population Prospects 2012/2022

Fig. 15 China's population demographics based on the 2022 forecast by the UN



Source: Prepared by JRI based on the United Nations' World Population Prospects 2022

that of Japan (4.6%) and Korea (8.1%), suggesting that young people in China are faced with harsh conditions. In China, *tang ping* (lying flat)—which refers to apathetic young people who are unconcerned about getting married, having children or achieving a successful career—is becoming a social issue. For many young people, getting married and having and raising children do not represent happiness in life, but represent anxiety. While it is hard to say that measures against the declining birthrate in any of these countries are working, the fact that the leadership of China is not showing an attitude of empathy towards young people who are seen as *tang ping* is making the situation worse (Miura [2022b]).

The Xi Jinping administration is likely to continue implementing measures to motivate people to have children. Nevertheless, a policy that is only focused on increasing the birthrate may antagonize the generations that are looking to have children. Economist Ren Zeping expressed his opinion on social media in January 2022 that if the central bank "prints two extra trillion yuan every year and uses that money for childbirth/child-rearing support measures, 50 million more babies will be born over the period of ten years." However, this opinion received a wave of criticism on the Internet, such as, "Does he think people will have children if they receive 40 thousand yuan?" and "That would cause further inflation"[(51)].

Moreover, in October 2022, a newlywed woman who lives in Nanjing City in Jiangsu Province posted a story on social media that she was "told by the local authority that they wanted her to get pregnant within one year and that they would give her a phone call every quarter," and the story became a big topic[(52)]. Many people dislike the attitude that women are to be treated as machines that create babies, and that the authorities should not intervene in family affairs such as decisions on whether or not to have children or how many children to have. Coercive ways of thinking, such as "the birthrate will increase if subsidies are boosted," or "people should as a matter of course cooperate in the measures against the declining birthrate" will only negatively impact the attitudes of the generations that could have children.

3. Differences in population change are growing due to migration

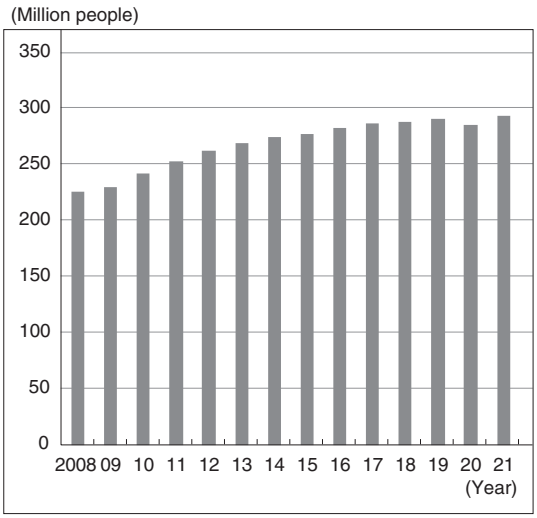
So far, we have been looking at China's low birthrate in terms of the country as a whole, but there is considerable variation from region to region in the degree to which the birthrate is falling and in the change in the population. Population is affected not only by natural increase/decrease, but also by social increase/decrease, i.e., the number of people moving in and out. This section first describes the overall picture of population migration and then illustrates that differences between regions where the population is declining and regions where it is increasing are growing, that population migration has an adverse impact on measures to deal with the low birthrate, and that population change is affected by the ability of cities to create jobs.

(1) Population migration: One in four people is a migrant

In China, the birthrate is falling in the northeastern provinces such as Heilongjiang, and population decline there is becoming more apparent due to excess outflow (i.e., the number of people moving out exceeds the number of people moving in). In the coastal areas such as Guangdong Province, however, the birthrate is not dropping very fast because of excess inflow, and the population in these areas continues to rise. One of the factors behind this is "rural migrant workers," people flowing into cities in search of work whose registered domicile is in a rural area. The number of rural migrant workers has increased almost continuously from 222.50 million in 2008, the first year for which statistics are available (Fig. 16), to 292.51 million in 2021. They now account for 60% of the 467.73 million urban workers.

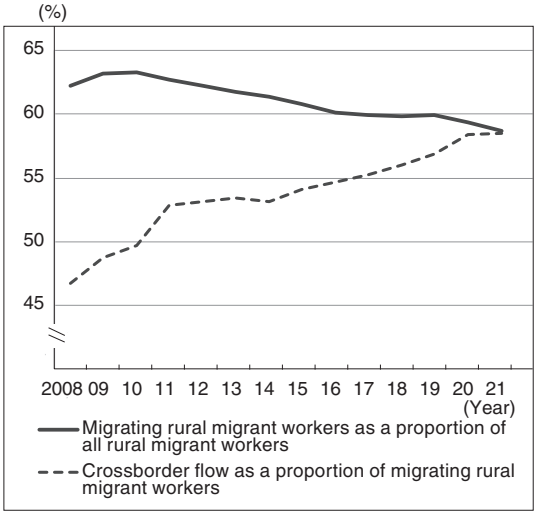
Their movement can be divided into two categories based on whether they have left the area of their registered domicile. Those who have not

Fig. 16 No. of rural migrant workers



Source: Prepared by JRI based on data from CEIC

Fig. 17 Proportions of migrating rural migrant workers and crossborder flow



Source: Prepared by JRI based on data from CEIC

left are classified as "hometown rural migrant workers," and those who have been away for at least six months are classified as "migrating rural migrant workers." Although the proportion of migrating rural migrant workers is falling gradually, they still account for 58.7% of the total at 171.72 million in 2021 (Fig. 17). The destinations of rural migrant workers greatly impact the populations of level-1 administrative divisions, i.e., provinces, directly governed cities, and autonomous regions, and the level-2 administrative divisions below them, i.e., prefecture-level cities.

Depending on whether their migration to the area in which they work crosses the borders of provinces, directly governed cities, or autonomous regions, migrating rural migrant workers can be classified as those who have not left the province, directly governed city, or autonomous region in which their domicile is registered (internal flow: 71.26 million people) and those who have left the province, directly governed city, or autonomous region in which their domicile is registered (crossborder flow: 100.46 million people). Internal flow does not affect the population of the province, directly governed city, or autonomous region as it is internal, but does affect the respective populations of the cities and villages. In contrast, crossborder flow affects the population of the province, directly governed city, or autonomous region itself. In 2021, it accounted for 58.5% of migrating rural migrant workers, increasing by 11.8 percentage points from 2008 (Fig. 17).

Population migration is not only movement from villages to cities. It also includes movement within the same village, movement between villages, movement within the same city, and movement between cities. There is also movement from cities to villages, even though its size is small. Furthermore, not only persons with rural domicile but also persons with urban domicile need to be added to the number of migrants. A population census provides an overall picture of such movements. To gain a more comprehensive understanding of movements, the population census finds out the "domicile-separated population," which is the number of people who have been away from the area of their registered domicile, be it a village or a city, for at least six months.

In 2020, the time of the Seventh Population Census, the domicile-separated population was 492.76 million, accounting for 35.0% of the total population. The domicile-separated population can be divided into those who work in the same province, directly governed city, or autonomous region as their registered domicile (internal movement: 367.93 million people) and those who work

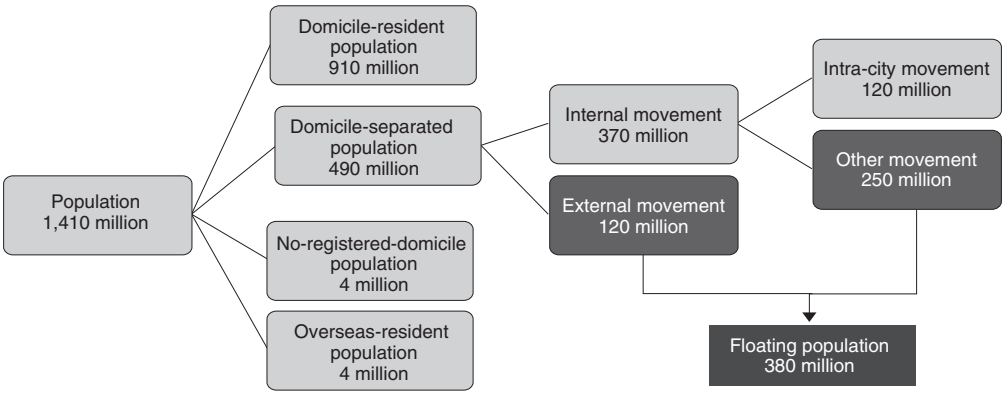
in a different one (external movement: 124.84 million people) (Fig. 18). Although the survey of rural migrant workers, which involves sampling, and the population census differ in terms of precision, when both are added together, we find that the internal flow of rural migrant workers in 2020 was 70.55 million people, accounting for 19.2% of internal movement in the census data. It can therefore be said that persons with urban domicile make up the majority. On the other hand, the crossborder flow of rural migrant workers is 99.04 million people, accounting for 98.6% of external movement, which means that almost all external movement involves persons with rural domicile.

Internal movement in the census can be divided into "intra-city movement," which means movement within the same city, and "other movement," which is other forms of movement. In China, the migrant population excluding short-distance intra-city movement is referred to as the "floating population" (Fig. 18). In 2020, the floating population was 375.82 million people. This is equivalent to 26.6% of the population in that year, which means that one person in four has migrated in a way that is not intra-city movement. In 2010, when the previous census was conducted, the floating population was 221.43 million, which accounted for 16.5% of the population, so the floating population now has a much greater influence on the populations of provinces, directly governed cities, and autonomous regions and on the urban population. Note that China's floating population covers those who have been away from the place of their registered domicile for at least six months. It therefore differs conceptually from the term "floating population" as used in Japan, which refers to people temporarily visiting a place where they do not live for work, school, business trip, vacation, etc.

There is quite a lot of variation in the floating population from province to province. Looking at the floating population as a proportion of the total population (floating population ratio) and the size of the floating population, Guangdong Province stands out (Fig. 19). In 2020, the province's floating population ratio was 41.3% and the floating population was 52.07 million, accounting for 13.9% of the total in China. The province's share of exports based on producer location was 26.6% in 2021, so the high figures are due to the province's status as China's largest production and exporting area. The floating population ratio is also high in Shanghai City (42.1%), Zhejiang Province (39.6%), and Beijing City (38.5%). In terms of size, Guangdong Province is followed by Zhejiang Province (25.56 million) and Jiangsu Province (23.66 million).

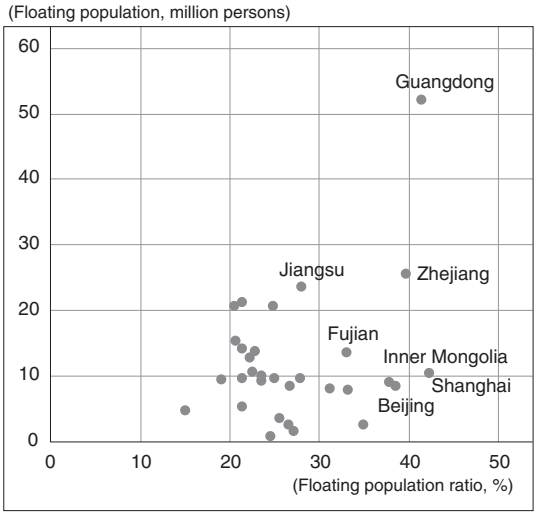
Looking at external movement as a proportion of the floating population (external floating popu-

Fig. 18 Classification of population by domicile and residence period and breakdown of domicile-separated population (2020)



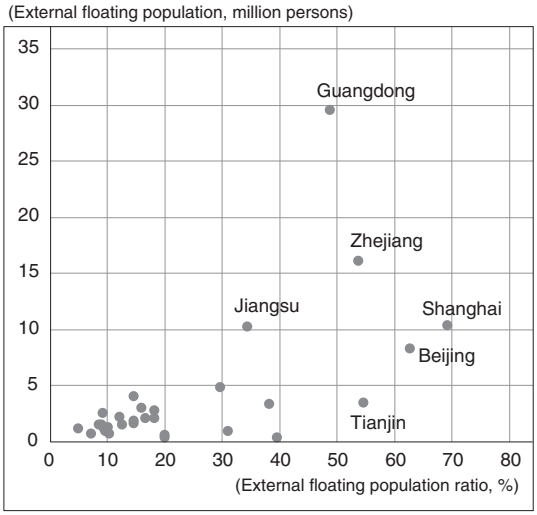
Notes: "Other movement" refers to movement from village to city, between cities, and from city to village. "Overseas" includes Hong Kong, Macau, and Taiwan.
Source: Prepared by JRI based on data from the National Bureau of Statistics of China (2022)

Fig. 19 Floating population ratio and size (2020)



Notes: Floating population ratio = (floating population / total population) x 100
Source: Prepared by JRI based on data from the National Bureau of Statistics of China (2022)

Fig. 20 External floating population ratio and size (2020)



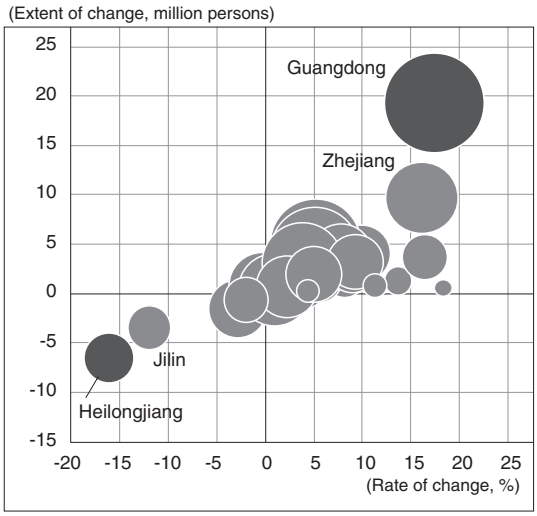
Notes: External floating population ratio = (external floating population / floating population) x 100
Source: Prepared by JRI based on data from the National Bureau of Statistics of China (2022)

lation ratio) and its size, we find that the situation is similar to Fig. 19 (Fig. 20). Here, too, Guangdong Province stands out, with figures of 48.9% and 29.62 million. However, the external floating population ratio itself is higher in Shanghai City (69.2%), Beijing City (62.8%), Tianjin City (54.6%), and Zhejiang Province (53.8%). This is because Guangdong Province has a higher population than other provinces, so it can satisfy its labor requirements with internal movement. In terms of size, Guangdong Province is followed by Zhejiang Province (16.19 million), Shanghai City (10.48 million), and Beijing City (8.42 million).

(2) Heilongjiang Province is a reflection of China's future

An increase in the floating population has a substantial impact on the population of provinces, directly governed cities, and autonomous regions, and also on the urban population. Regarding the rate of change in population in 2020 compared with 2010 and the extent of change calculated by subtracting the population in 2010 from the

Fig. 21 Positioning of each province based on population growth rate and extent of change (2010/2020)



Notes: The sizes of the circles denote their relative populations in 2020.
Source: Prepared by JRI based on data from CEIC

population in 2020, the figures for Guangdong Province are increases of 17.6% and 19.28 million persons, so even though China's population is in visible decline, that of Guangdong Province is likely to continue to grow (Fig. 21). In contrast to this is the situation in Heilongjiang Province in

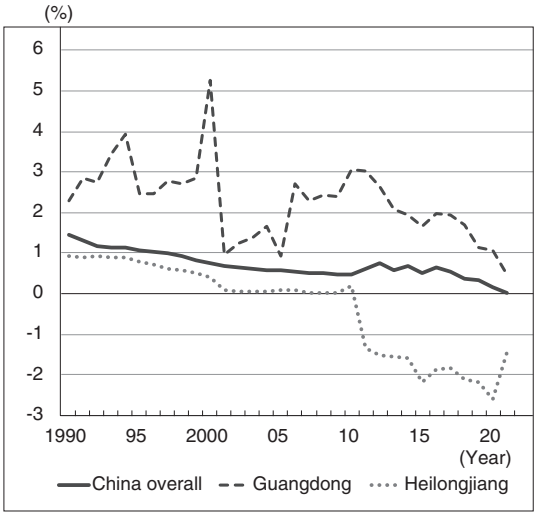
the northeast of the country, where the population fell by 16.2%, or 6.58 million people, between 2010 and 2020. Heilongjiang Province therefore offers a peek into China's future, a country whose population is about to decline.

In fact, there is a clear difference between the population trends of the two provinces when viewed against the rate of change in the population of China as a whole. Guangdong Province's population growth rate slowed from the 2010s, but it has always been above the rate of China. In contrast, Heilongjiang Province's growth rate has always been below that of the country, and its population started to fall as early as 2011 (Fig. 22). The provinces of Jilin and Liaoning, which are also in the northeast, are also seeing their populations decline, though the decline began somewhat later than it did in Heilongjiang Province.

Reasons that population decline has become conspicuous in Heilongjiang Province include the province's heavy dependence on state-owned enterprises in smokestack industries such as oil and coal and the fact that there are few job opportunities there. In conjunction with the urbanization that occurred as a result of China's economic reforms and opening-up policies, the number of urban workers in the country increased rapidly. However, the number of urban workers in Heilongjiang Province was 8.92 million in 2021, hardly any different from the figure recorded in 1995. This contrasts with the situation in Guangdong Province, where urban workers rose from 11.38 million to 54.73 million during the same period (Fig. 23).

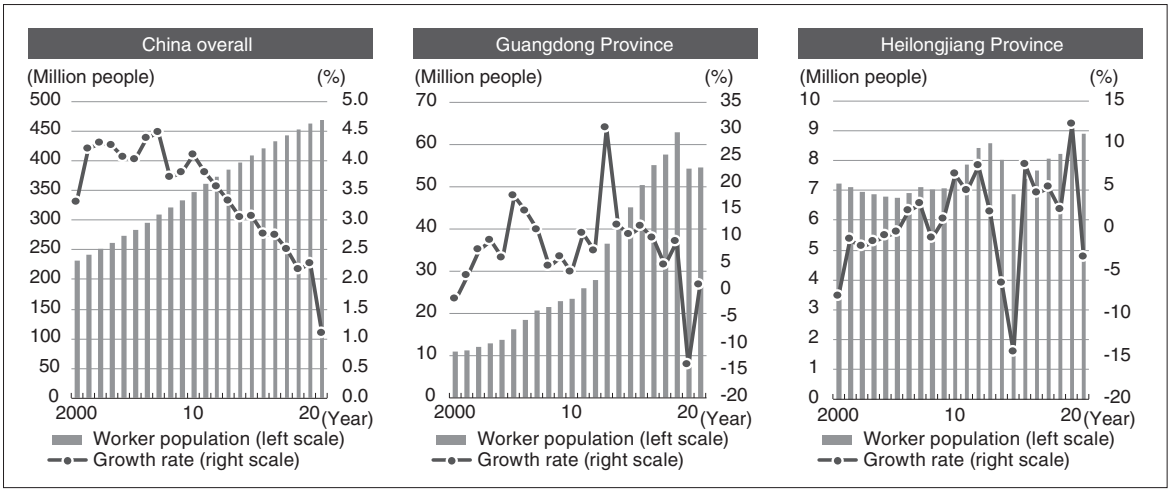
The economic stagnation in Heilongjiang Province caused a decline in the total fertility rate

Fig. 22 Population growth rates of Guangdong and Heilongjiang Provinces



Source: Prepared by JRI based on data from CEIC

Fig. 23 Number and growth rate of urban workers in Guangdong Province and Heilongjiang Province



Source: Prepared by JRI based on data from CEIC

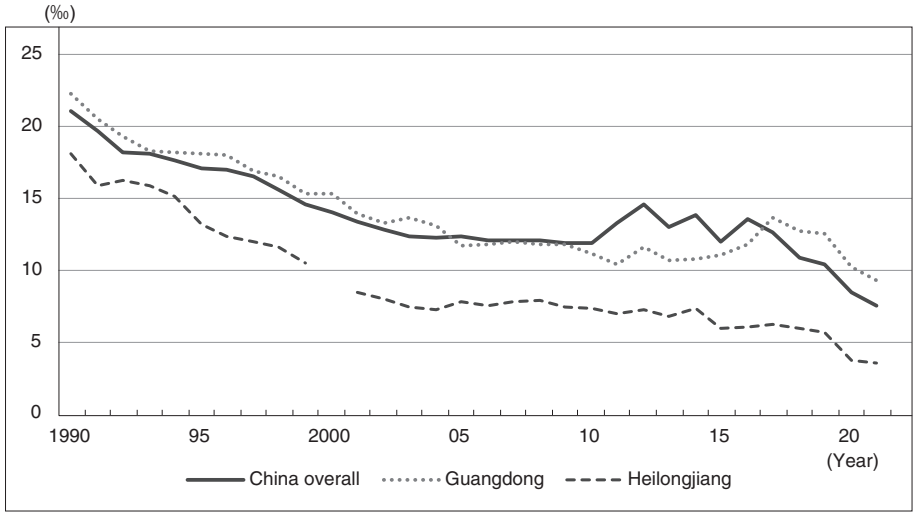
there. According to the Seventh Population Census, the province's figure is just 0.76, half the level for China as a whole, which is 1.30. The total fertility rate is also less than one in places such as Shanghai City (0.74), Beijing City (0.87), Jilin Province (0.88), and Liaoning Province (0.92), but the declines in Shanghai and Beijing are mainly due to lower desire to have children as a result of urbanization and higher levels of educational attainment. In contrast, the falls in the three northeastern provinces of Heilongjiang, Jilin, and Liaoning likely reflect increasing uncertainty surrounding employment and incomes, which is evident from the lack of growth in the number of urban workers. Guangdong Province's total fertility rate stands at 1.36, which is higher than the all-China figure.

Another factor behind the population decline is the falling population of women of reproductive age. In 2020, Heilongjiang Province's population of females aged 15-49 had dropped by 36.3% from 2010 to 7.20 million, a fall of 4.11 million people. This rate of decline is far higher than the national drop of 15.1%. In Heilongjiang Province, the aging of the population that is occurring in conjunction with the outflow of labor is causing the birthrate to decline. The province's birthrate stood at 3.6‰ in 2021, less than half the figure for China as a whole, which was 7.5‰ (Fig. 24). A similar trend is seen in Jilin and Liaoning provinces, and the *2021 China Population Projection Report* predicts that the population of the northeast will fall by 1.389 million between 2020 and 2040, causing the population disparity with the east of the country, which will increase by 418,000, to widen[53]. The east comprises the nine cities/provinces of Beijing City, Tianjin City, Shandong Province, Jiangsu Province, Shanghai City, Zhejiang Province, Fujian Province, Guangdong Province, and Hainan Province.

(3) There is another reason that measures to deal with the low birthrate are not gaining traction

Economic shrinkage due to population outflow is a cause for concern in every province, directly governed city, and autonomous region. So far, we have focused on Heilongjiang Province, but the same problem could arise in other provinces, too. Looking at the rate of population decline between 2010 and 2020, we see that besides Heilongjiang

Fig. 24 Birthrates in Guangdong Province and Heilongjiang Province



Notes: Data for Heilongjiang Province in 2000 is not available.
Source: Prepared by JRI based on data from CEIC

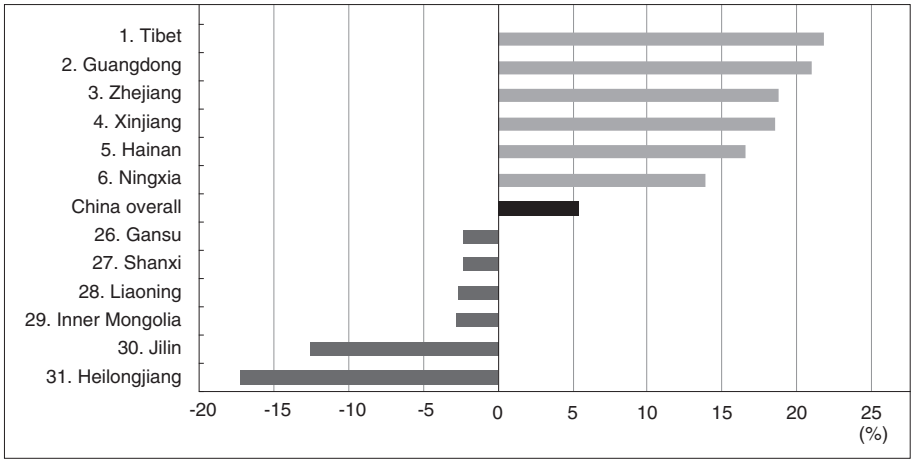
Province, the danger is also high in Jilin Province, the Inner Mongolia Autonomous Region, Liaoning Province, Shanxi Province, and Gansu Province (Fig. 25). Shanxi Province and the Inner Mongolia Autonomous Region are both heavily reliant on the coal industry(54). While Gansu Province is home to the Changqing oil field, there are no notable other industries, and the fact that the province has been left behind in terms of economic development is having an impact. In 2021, the province's per-capita GDP was 41,046 yuan, which is around half of the figure of 80,976 yuan for China as a whole and puts it at the bottom of all 31 provinces, directly governed cities, and autonomous regions.

On the other hand, besides Guangdong Province, regions with marked population growth include the Tibet Autonomous Region, Zhejiang Province, the Xinjiang Uyghur Autonomous Region, Hainan Province, and the Ningxia Hui Autonomous Region. Zhejiang Province's population growth can be viewed in a similar context as that of Guangdong Province, but the circumstances in the other provinces and autonomous regions are different. In the Xinjiang and Ningxia autonomous regions, restrictions on births have been relaxed for ethnic minorities(55), while the situation in Hainan Province, "China's Hawaii," has been affected by the rapid development of the tourism industry.

Population migration includes not only outflows, but also inflows, and the difference between the two, i.e., the net outflow/inflow, affects the population. Even if measures to tackle low birthrates prove effective to some extent, if there is excess outflow, i.e., the net outbound population increases, the impact of the measures is canceled out. An increase in net outflow reduces the birthrate, so even though measures to deal with low birthrates have been strengthened, it is not easy to halt the population decline. Heilongjiang Province looks to have already fallen into this vicious circle. In contrast, if there is excess inflow, i.e., the net inbound population increases, the population will continue to rise, regardless of low-birthrate countermeasures. This is because people who have arrived in search of job opportunities bear and raise children. Guangdong Province is a good example of this.

The size of the net outbound/inbound population reflects the degree to which job opportunities are available, and holds the key to making sense of future demographics in each province. This problem was illustrated clearly with the Seventh

Fig. 25 Six provinces and autonomous regions with high population growth rates and six provinces and autonomous regions with low population growth rates (2010/2020)



Source: Prepared by JRI based on data from CEIC

Population Census. In the case of Heilongjiang Province, the number of people living outside the province whose registered domicile is in the province (outbound population) was 3.93 million in 2020. On the other hand, the number of people living in the province whose registered domicile is in another province (inbound population) was 830,000. The difference between the two, i.e., the net outbound population was 3.10 million, which is equivalent to 9.8% of the province's population. For Guangdong Province, meanwhile, the outbound population was 1.69 million and the inbound population was 29.62 million, putting the net inbound population at 27.93 million. This is equivalent to 22.1% of the province's population.

If the net outbound/inbound population is high, and it has a substantial impact on the province's population, low-birthrate countermeasures will be viewed by the provincial government as having a different meaning to that intended by the national government. In 2020, the number of births in Heilongjiang Province was just 120,000, so from the point of view of the provincial government, even if the focus has been on measures to combat the low birthrate, it is impossible to halt population decline due to population outflow. In Guangdong, on the other hand, the number of births was high, at 1.3 million, but even then, it is population inflow rather than low-birthrate countermeasures that influences the population. The lack of proliferation of low-birthrate countermeasures is not only due to the financial problems of regional governments. Rather, in terms of the impact on population, the effect of population outflow/inflow is far greater than that of low-birthrate countermeasures.

(4) The key is the growth rate of the urban population

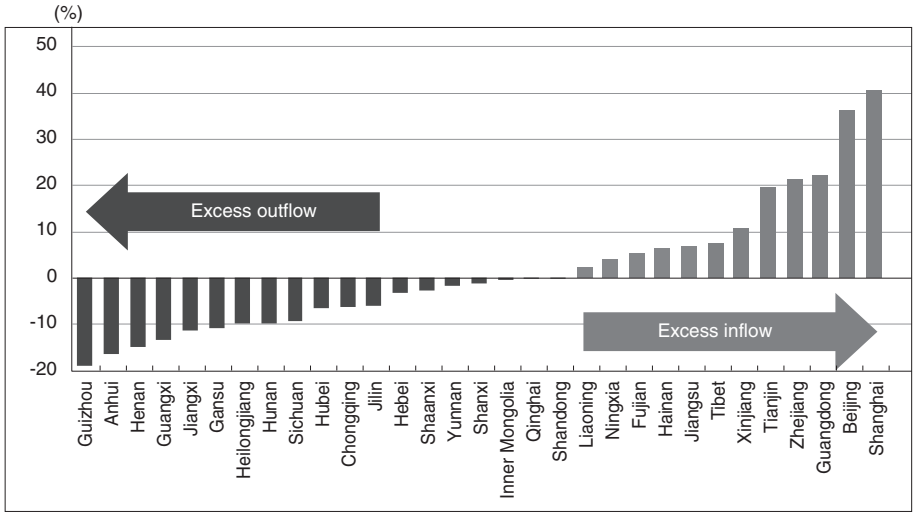
"External movement" has a big impact on the populations of provinces, directly governed cities, and autonomous regions. In the census data, both the outbound population and the inbound population are shown in the form of a matrix, so it is possible to identify the net outbound/inbound population. Looking at the net outbound/inbound population as a proportion of the population of each province in 2020, we find that there are several regions with a higher net outbound population than that of Heilongjiang Province. These are Guizhou Province, Anhui Province, Henan Province, Guangxi Zhuang Autonomous Region, Jiangxi Province, and Gansu Province (Fig. 26).

At first glance, it appears highly likely that the populations of these provinces and autonomous regions would decline by more than that of Heilongjiang Province. However, a net outflow of population results directly in population decline only in provinces where population increase has stalled, so it cannot be said that the situation is more serious in these provinces and autonomous regions than it is in Heilongjiang Province. As we saw in Fig. 25 earlier, Gansu Province is an exception, but the populations of Guizhou Province, Anhui Province, Henan Province, Guangxi Zhuang Autonomous Region, and Jiangxi Province are not in decline. To illustrate this problem in an easy-to-understand way, we have divided the population change in the three provinces of Heilongjiang, Guizhou, and Guangdong into natural increase/decrease and social increase/decrease (Fig. 27).

The factors behind population change differ depending on the province. In Heilongjiang Province, natural decrease has added to social decrease, accelerating population decline. In Guizhou Province, however, natural increase has been stable, and going into the 2010s, social decrease turned into social increase, so the population continued to rise. Meanwhile, in Guangdong Province, while the impact of the COVID-19 pandemic caused social increase to fall, the province can be said to be the region with the most marked natural increase and social increase. Anhui Province, Hebei Province, Guangxi Zhuang Autonomous Region, and Jiangxi Province all have rising populations, like Guizhou Province. In these regions, it will take a little more time before the issue of population decline surfaces.

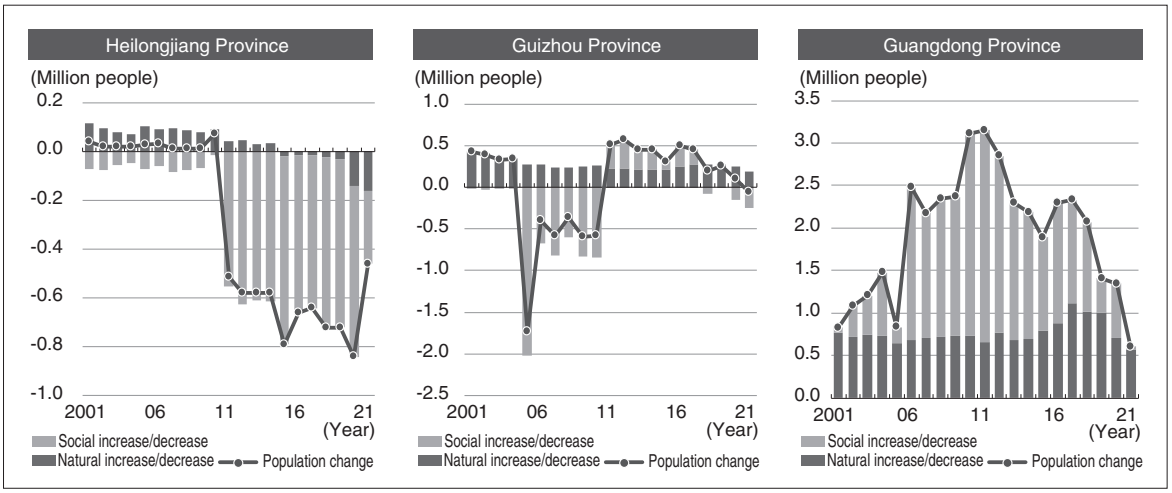
Provinces where, like Heilongjiang Province, the population decline problem has already become apparent are characterized not only by clear

Fig. 26 Net outbound/inbound population as proportion of population of each province as of 2020



Notes: Net outbound/inbound populations in 2020 calculated using this formula: net outbound/inbound population = (population inflow) – (population outflow) / population.
Source: Prepared by JRI based on data from the National Bureau of Statistics of China (2022)

Fig. 27 Breakdown of factors behind population change in Heilongjiang, Guizhou, and Guangdong Provinces

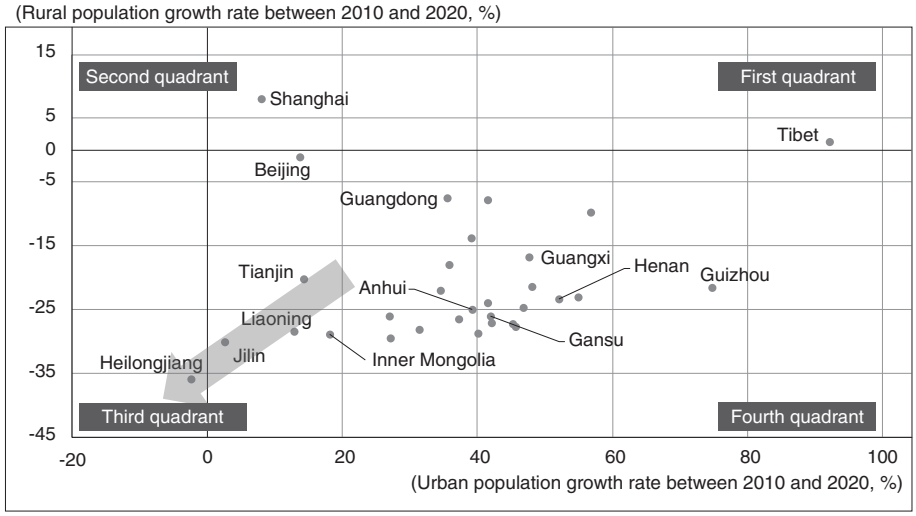


Notes: Social increase/decrease = population change – natural increase/decrease
Source: Prepared by JRI based on data from CEIC

falls in the rural population, but also by low rates of urban population increase. Plotting the rate of growth in the urban population between 2010 and 2020 on the horizontal axis and the rate of growth in the rural population during the same timeframe on the vertical axis, China's provinces, directly governed cities, and autonomous regions can be found in three quadrants, only being absent from the second quadrant (Fig. 28). Many provinces have a negative rural population growth rate, but the urban population growth rate is negative only in Heilongjiang Province. However, it is probably only a matter of time before Jilin Province and Liaoning Province shift into the third quadrant.

The fact that the urban population is not increasing means that cities are not fulfilling their

Fig. 28 Urban and rural population growth rates between 2010 and 2020



Source: Prepared by JRI based on data from CEIC

function as a receptacle for the labor flowing out of the countryside. Urban population growth rates are also low in Shanghai and Beijing, but both these cities have employed strict domicile rules to suppress population inflows. The circumstances of these two cities and cities in the northeast are therefore completely different. Population decline that is accompanied by urban population decline is evidence that the cities have lost vitality, and that their economic foundations are subsiding. This makes it incredibly difficult to escape from population decline. Looking at urban population growth rates, we see that it is possible that not only Jilin and Liaoning provinces, but also Tianjin City and the Inner Mongolia Autonomous Region will move into the third quadrant.

4. The economic impact of population decline

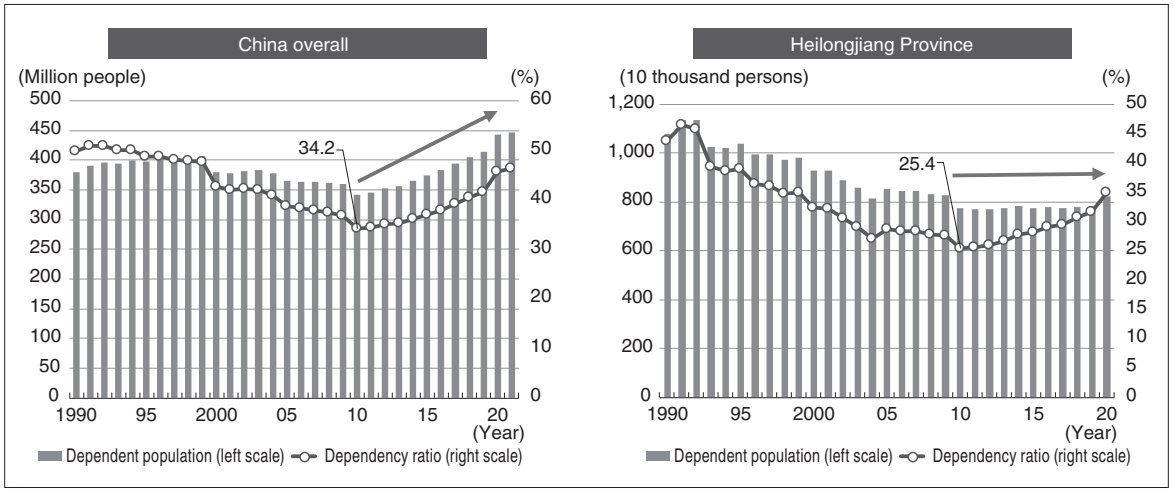
The population of Heilongjiang Province peaked in 2010. About ten years ahead of China in terms of population decline, the province serves as a good example of how population decline impacts an economy. This section discusses its impact on economic growth, pension financing, and the housing market.

(1) Economic growth: Shrinking population slows growth

The labor force, along with capital, is an integral factor for the growth of an economy. Population decline, especially a decline of the working-age population, negatively affects economic growth. Even if the working-age population is not decreasing, an increase in the ratio of youth and elderly populations to the working-age population (the dependency ratio)[56] decelerates the economic growth. That is called "population onus." China's dependency ratio has been increasing after bottoming out in 2010 at 34.2%, and is expected to continue to increase in the future (left graph in Fig. 29).

Considering that Heilongjiang has seen its population decrease since 2011, the province's dependency ratio might be assumed to have started increasing earlier than the whole of China. However, the ratio started to increase in the same year as the entire country, which was 2010 (right graph in Fig. 29), meaning that the province did not expe-

Fig. 29 China's and Heilongjiang Province's dependent population and dependency ratio



Notes: The dependency ratio is the percentage of the dependent population (0–14 years old, and 65 years old or above) to the working-age population (15–64 years old); although the statutory retirement ages in China are 55 for women and 60 for men, Fig. 29 defines the upper limit of the working-age population as 65 due to data constraints.
Source: Prepared by JRI based on data from CEIC

rience population onus ahead of the country. The reason why China's dependency ratio is higher than Heilongjiang's may be that coastal cities have a larger elderly population because they restrict population influx, while areas mainly inhabited by ethnic minorities have a larger youth population.

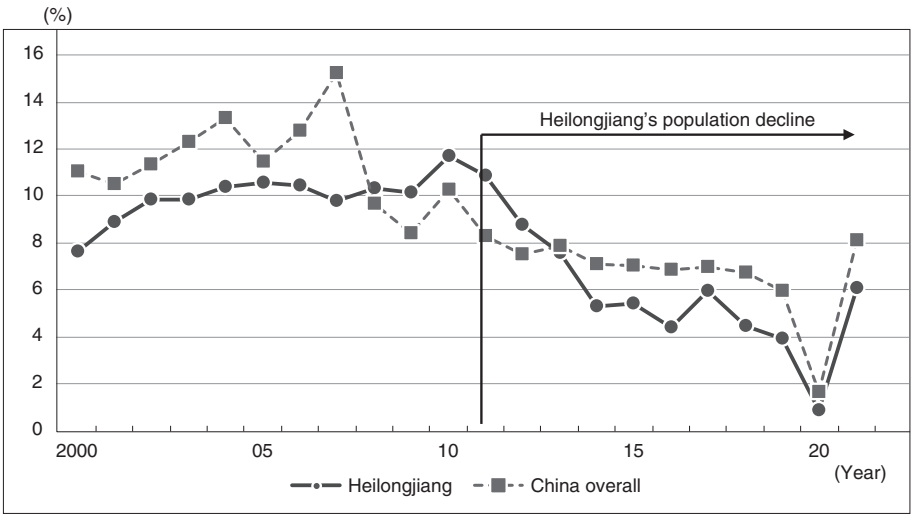
Still, the trend of the working-age population itself indicates the harsh conditions faced by Heilongjiang Province. Fig. 29 shows that, while the national dependency ratio is rising in line with the increase in the national dependent population, the province is seeing its dependency ratio go up even though its dependent population remains unchanged. That is because the province's working-age population is shrinking; In fact, in 2020, the province's working-age population decreased by 23.1% from 2010 to 23.49 million. That is a decrease of 7.07 million people.

Heilongjiang's real GDP growth has been consistently lower than China's since 2013, two years after 2011, the year in which the population began to decline (Fig. 30). The average growth for the period between 2011 and 2021 is 5.3%, which is roughly half the figure for the period between 2000 and 2010 before the population decline (10.2%). China's average growth rates for the same periods are 6.7% and 10.6%, respectively. If the gap in the average growth for the period from 2011 to 2021 is attributed solely to the difference in the working-age population while ignoring the differences in fundamental conditions and production factors between Heilongjiang Province and China, it can be said that the province's growth rate declined 1.4% point due to the shrinking working-age population.

Due to the decrease in its working-age population, the country as well will not be able to avoid growth deceleration. S&P estimates China's potential annual growth rate to be 4.9% for the period from 2022 to 2025, 4.1% from 2026 to 2030, and 3.1% from 2031 to 2040. With labor input projected to decrease by 0.2%, 0.3% and 0.8% during the respective period, the expected acceleration of labor input decrease is expected to put downward pressure on China's economic growth (Kuijs [2022]).

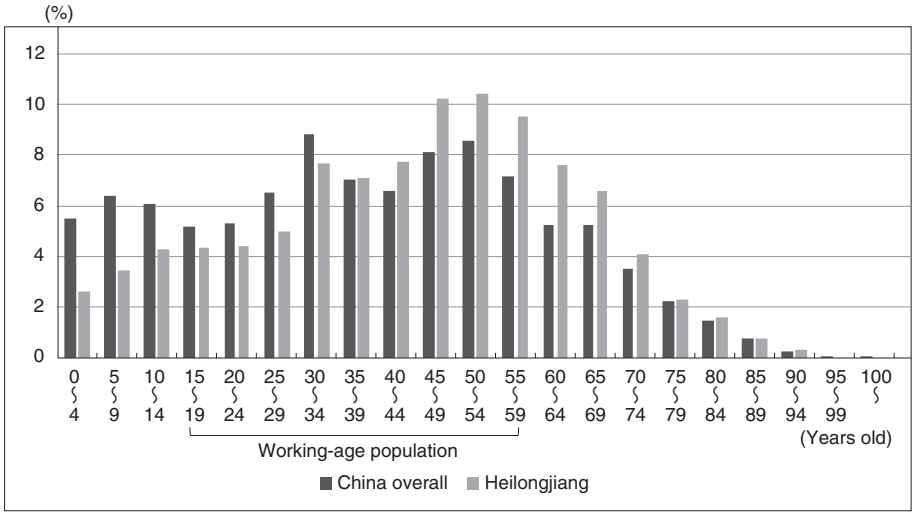
Looking at the distribution of the working-age population by age group, the distribution of Heilongjiang's working-age population is unimodal, with the ratios of the groups of 45–49 years old, 50–54 years old and 55–59 years old the largest, while that for China is bimodal, with the percent-

Fig. 30 Heilongjiang Province's and China's real GDP growth



Source: Prepared by JRI based on data from CEIC

Fig. 31 Heilongjiang Province's and China's population distribution by age group (2020)



Source: Prepared by JRI based on data from the National Bureau of Statistics of China (2022) and Heilongjiang Statistical Yearbook 2021 (Heilongjiang Statistical Bureau)

ages of the groups of 30–34 years old and 50–54 years old the highest (Fig. 31). Hence, the province and the country experience the impact in different ways and at different times. For Heilongjiang, the working-age population will drop in the next 15 years, when the age groups of 55–59 years old, 50–54 years old and 45–49 years old—those occupying the largest percentages—retire. Thus, the economic slowdown will become apparent within a short period of time.

On the other hand, the national working-age population is not expected to rapidly decline like Heilongjiang Province, due to the group of 30–34 years old being the largest in the working-age population and the groups of 0–4 years old, 5–9 years old and 10–14 years old being the largest in the non-working-age population. Nonetheless, unless China solves the problem of birthrate decline in 30 years before those currently 30–34 years old retire, it will see the decrease in its working-

age population lead directly to an economic slowdown, just as in Heilongjiang.

In around 2030, the size of the Chinese economy is anticipated to surpass that of the American economy and become the largest in the world. However, some predict that its expansion will be hindered by population decline and that it will become the second largest in the world again in around 2060 (Saruyama and Tahara [2019]). In fact, China's population in 2060 is anticipated to be 1,205.02 million by the medium-variant projections of UN 2022, and 1,144.59 million by the *2021 China Population Projection Report*, both 200 million fewer than 1,412.60 million in 2021. It is plausible that China's economy will lose the number one spot because of population decline.

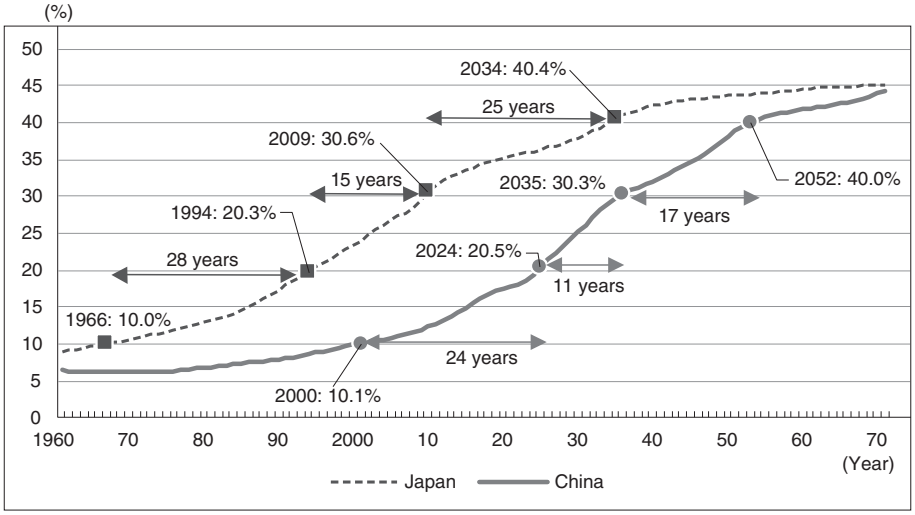
(2) Pension: The financial condition is starting to worsen

Birthrate decline naturally causes the population to age and, consequently, makes social security for senior citizens an important policy issue. In August 2022, the National Health Commission published a paper entitled *Writing a new chapter on the population in the new era* in Qiushi, the journal of the Communist Party of China. The paper, anticipating that China's population will start to decline within the period of the 14th Five-year Plan (2021–2025), finds that the progress of population aging will increase the percentage of those aged 60 or older to more than 30% in 2035 and weaken the caregiving and childrearing capabilities of families as the structure of the family becomes nuclear[57].

China's population aging is characterized by its speed. When we look at the medium-variant projections of UN 2022 to see how the proportion of those aged 60 or older to the total population will change, that for Japan reached 10% in 1966 and took 28 years for it to surpass 20%, and then another 15 years to exceed 30%. And it is expected to take 25 years to exceed 40% (Fig. 32). China reached 10% in 2000, and it took 24 years for it to exceed 20%, nearly as fast as Japan's, but it is estimated to take 11 years to exceed 30% and 17 years to exceed 40%, both much shorter timeframe than Japan's. This is considered attributable to the One-child Policy.

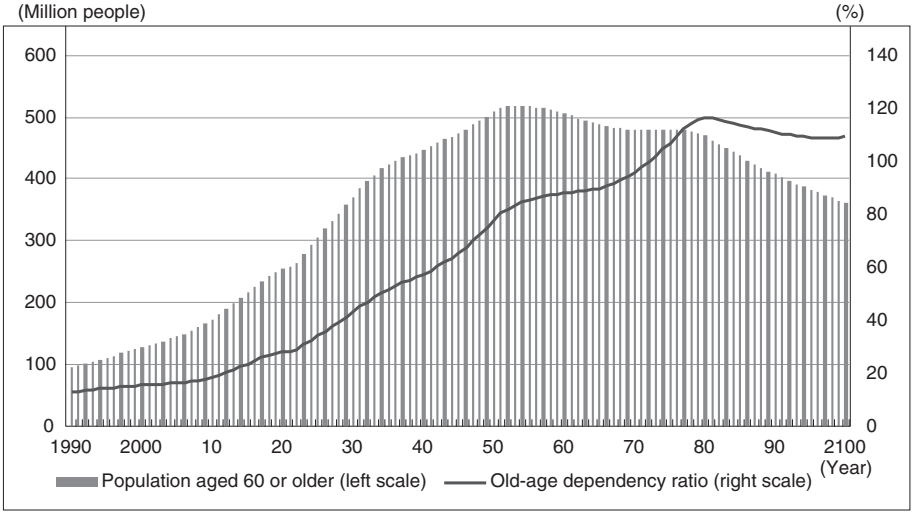
Even while the proportion of the population aged 60 or older will continue rising, that elderly population itself is expected to decrease after

Fig. 32 Ratio of the population aged 60 or older in Japan and China



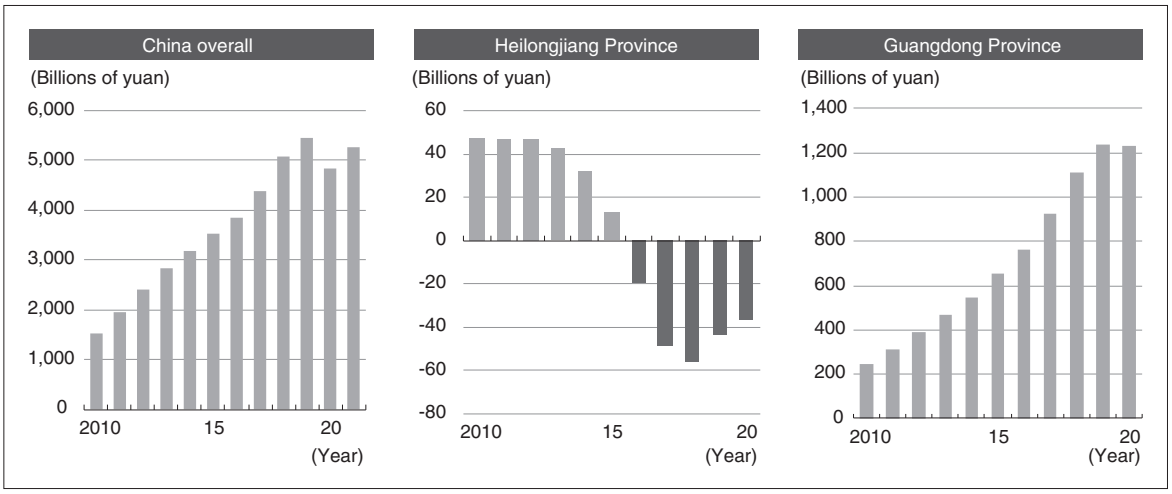
Notes: Medium-variant projections.
Source: Prepared by JRI based on the United Nations' World Population Prospects 2022

Fig. 33 China's population aged 60 or older and old-age dependency ratio



Notes: Medium-variant projections.
Source: Prepared by JRI based on the United Nations' World Population Prospects 2022

Fig. 34 Balance of the Urban Workers' Pension Scheme reserve fund



Source: Prepared by JRI based on data from CEIC

peaking out in around 2055 (Fig. 33)[58]. This almost sounds like good news with respect to the sustainability of pension financing, but the non-elderly population, which is to sustain the living costs of the elderly, will decline even faster, and that is certain to exacerbate the financial condition of the Chinese pension system. The country's old-age dependency ratio, the ratio of the elderly population aged 60 or older to the working-age population aged 15 to 59, is projected to continue rising until around 2080.

The aggravation of the pension finance is already happening in Heilongjiang, where population aging is especially serious due to the outflow of the working-age population and the decline in the total fertility rate. The reserve fund of the province's "Urban Workers' Pension Scheme," which is a public pension scheme in China that covers employees of state-owned enterprises and large private enterprises, has already declined, and

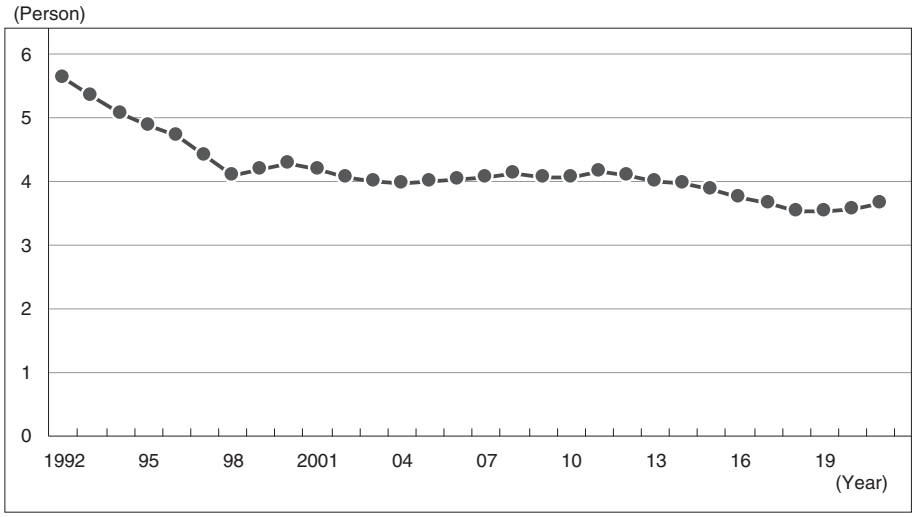
in 2016, began to go into the deficit (Fig. 34). The deficit is believed to be covered by the province's coffers; social security expenditures amounting to 135.1 billion yuan occupied the largest share of Heilongjiang's public spending in 2020 at 24.8%.

The Urban Workers' Pension Scheme in China is a mixture of the pay-as-you-go pension plan and the fully funded pension plan, and requires high contributions to offer high benefits, supported by public funding. Therefore, the rising old-age dependency ratio inevitably poses difficulties to pension finance. In Guangdong Province, the reserve fund is projected to keep expanding since its working-age population will continue to increase. For China overall, on the contrary, with other regions including Liaoning Province predicted to follow the path of Heilongjiang, the balance is likely to shrink going forward. The reserve fund of Heilongjiang's Urban Workers' Pension Scheme peaked in 2010, which precedes the province's population decline. Judging from this, it will not be long before the national reserve fund of the scheme begins to decrease.

In China, there is another public pension scheme called the "Basic Endowment Insurance for Urban and Rural Residents," which is for private-sector workers and those outside of the workforce. It is also supported by public funding, but the balance of the reserve fund has been steadily accumulating because it is a fully funded pension plan, so there is no need to worry that the fund may go into deficit. The problem is, however, that the scheme does not function as a safety net for the elderly. Its annual payment amount in 2019 was 1,943 yuan, just one-twentieth of the amount paid by the Urban Workers' Pension Scheme (Miura [2022a]).

In the context of measuring the sustainability of pension financing, the pension support ratio (the ratio of those in the working age paying premiums to those receiving pensions) is often adopted. The figure for the Urban Workers' Pension Scheme dropped to 3.7 in 2021 from 5.6 in 1995 (Fig. 35). Compared with 2.4, the figure for Japan's Employees' Pension Insurance in 2020[59], the situation in China is ostensibly less severe than in Japan. However, based on the following problems, it is quite reasonable to believe that the financial condition of China's pension system will exacerbate so rapidly that it will badly affect the country's public finance as severely as, or more severely than, public finance in Japan.

Fig. 35 Pension support ratio for China's Urban Workers' Pension Scheme



Notes: The pension support ratio is the proportion of those paying premiums to those receiving pensions.
Source: Prepared by JRI based on data from CEIC

First, reforms to maintain a balance between the expenditures and revenues of regional pension finance are still not in place. In the "report on the reinforcement and promotion of countermeasures against population aging" announced at the Standing Committee of the National People's Congress in August 2022[60], the government vowed to unify the different pension systems managed at the provincial level and establish a "central coordination system" for the central government to manage them.

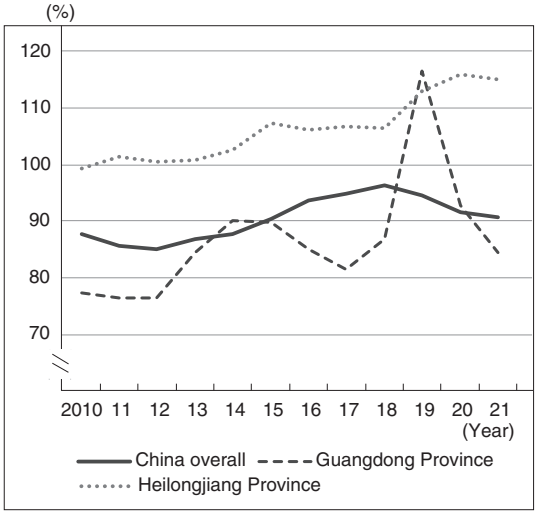
This should contribute to maintaining the soundness of the nationwide pension financing by pooling the risk of ballooning pension expenditures, which varies by region. Actually, the Chinese government had promised to establish that system four years before[61]; it is one of the policies that the Chinese government has formulated but not yet implemented. The "central coordination system" virtually compels the regions that succeed in accumulating the pension fund to assist the others, and can curb the payment amounts in those regions. Hence, such coordination is difficult to implement even for the Xi Jinping administration.

Second, efforts to control the spending—one of which is raising the retirement age—are not sufficient. Designating Jiangsu Province as the pilot area, the Chinese government announced that it would start raising the pension age of the Urban Employees' Pension Scheme by raising the retirement age in March 2022[62]. However, the retirement age is to be raised by at least one year, and the raise is required to be based on the employee's own will. Moreover, it is accepted only when the company approves. Given the limited scope of application, it is questionable whether this raising of the retirement age will take root. In addition, many pension scheme members in China look forward to retirement to start a new life. Past opinion polls reveal that as many as 60% to 90% of respondents were opposed to the raising of the retirement age, suggesting that this will be a challenging task[63].

Third, the level of benefits is raised, although the financial condition of the pension system is certain to be aggravated. To curb spending, it is imperative to lower the level of benefits in ways other than raising the retirement age. Nevertheless, there is almost no sign of such measures being implemented in China. The per-capita benefit amount of the Urban Workers' Pension Scheme, calculated by dividing the scheme's total expenditures by the number of the recipients, was 42,929 yuan in 2021. The pension replacement rate based on the disposable income in urban areas has been above 90% (Fig. 36).

In Heilongjiang Province, the pension replacement rate is high, reflecting the large number of state-owned enterprises. On top of that, the rate is continuing to rise because the growth of wages paid to the workforce is stagnating. The fact that these issues are still not being addressed despite the pension fund being in deficit clearly implies how difficult it is to take on the challenge of reforming the pension system in China. Using the provincial budget to pay benefits to those who retired from state-owned companies is undoubtedly unfair, but trying to mend that situation may challenge the Communist Party's rule, which is founded on public ownership.

Fig. 36 Pension replacement rate of Guangdong Province's and Heilongjiang Province's Urban Workers' Pension Scheme



Notes: The pension replacement rate is the proportion of the annual pension received to the annual disposable income in urban areas.
Source: Prepared by JRI based on data from CEIC

This problem is also true for the entire Urban Workers' Pension Scheme. In 2021, the scheme received a subsidy of 1.2763 trillion yuan, seven times as much as in 2010. With that amount equal to 28.9% of the total premium income, the scheme cannot be sustained without subsidization. The lowering of the benefit level needs to be discussed nationwide, not just at the provincial level in Heilongjiang, but this will cause more opposition than raising the retirement age.

The Center for International Social Security Studies, a government think tank under the Chinese Academy of Social Sciences, estimates that the fund of the UrbanWorkers' Pension Scheme will go into deficit in 2035[(64)]. Looking at Fig. 34, the speed of the decline is expected to be extremely fast. Moreover, the estimate is merely as of 2019. When the data of the Seventh National Population Census is incorporated, the balance would surely fall into deficit even earlier. Although China's government debt in 2020 was not so large, at 93.1% of the GDP (IMF [2022]), it is certain that the spending on the Urban Workers' Pension Scheme will inflate government debt and erode the national finance.

(3) Housing market: Polarization will accelerate even further

Population decline diminishes housing demand and accordingly lowers housing prices. In Heilongjiang, however, housing prices continued rising until 2019 even though the population began to decline in 2011. The background to this is that investors seeking capital gains targeted regions excluding coastal cities to evade regulations on housing prices. In China, housing prices were driven by speculative demand, not by actual demand (Miura [2021]). With the "Three Red Lines" setting targets for the reduction of property developers' debt and regulations on total volume of real estate-related loans by banks, the situation has reversed, as demonstrated by the price starting to fall in Fig. 12.

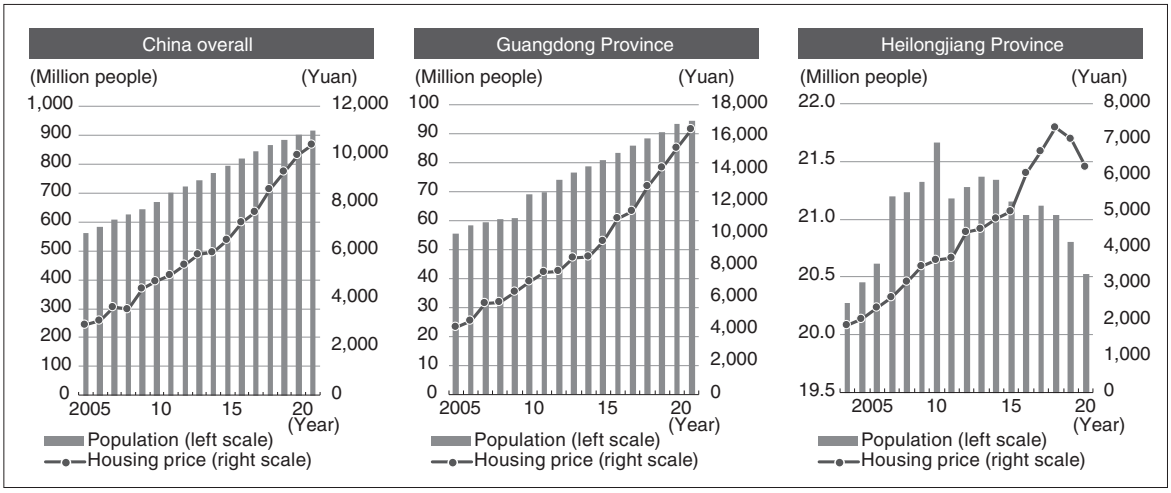
It might be assumed that the timing at which the price decline began was earlier in areas where population decline was progressing, and the extent of the decline was greater. On an annual basis, housing prices in Heilongjiang began to decline when the COVID-19 pandemic started in 2020, by 4.3% year on year, and continued to decline in 2021, at a rate of 10.9% year on year. The province saw the price decline ahead of others among the 31 provinces/directly governed cities/autonomous regions, and its decline rate was also the largest (Fig. 37). In contrast, the price rose by 8.6% in 2020 and 7.3% in 2021 in Guangdong. The price gap between the two provinces widened to 10,211 yuan per square meter in 2021 from just 1,395 yuan in 2005.

The truth is that no obvious correlation can be observed between the population and housing prices in the 31 provinces/directly governed cities/autonomous regions. The same can be said for the 293 prefecture-level cities. This is ascribable to the government's policy to support housing prices, which is concerned about the bursting of the bubble economy. (Miura [2021]). With the government setting the limit for the price decline, housing prices is increasingly being state-controlled. Still, as population decline will put downward pressure on housing prices over time, it is anticipated that more and more areas will see the price fall in the long run due to population decline.

In January 2022, Hegang City in Heilongjiang Province went bankrupt. The city saw its core industry of coal wane due to resource depletion, and its population shrank by 180,000 to 890,000 in 2020, down from 1.06 million in 2010, making it known for the cheapest housing prices in the country. The situation in Hegang City is not exceptional. Of the 290 prefecture-level cities for which valid data can be obtained out of the 293 prefecture-level cities, as many as 133, or 45.9% of the total, saw the population in 2020 decrease from that of 2010. Among them, the decrease rates for 25 cities exceeded Hegang's figure (15.8%).

Prefecture-level cities where the population is shrinking are concentrated in Northeastern China, as expected. All of Heilongjiang Province's 12 prefecture-level cities are witnessing population decline, while seven of the eight prefecture-level

Fig. 37 Guangdong Province's and Heilongjiang Province's urban population and housing price



Source: Prepared by JRI based on data from CEIC

cities in Jilin Province and 12 of the 14 in Liaoning Province are facing population decline. In the future, these cities are likely to experience a vicious cycle in which the acceleration of population decline causes housing prices to fall and leads to further population drain. On the other hand, in Guangdong, the population influx is thought to keep housing prices high and encourage further population influx.

China is becoming polarized into regions where the economy is weakening in response to population decline and regions where the economy is still booming as a result of population growth. And now that China is facing population decline as a whole, that polarization is expected to accelerate. As a matter of fact, in spite of the possibility of a housing bubble collapse becoming more likely, the prices of newly built houses in Guangzhou and Shenzhen—cities in Guangdong—are steadily maintaining a high level.

Conclusion

Full-scale population decline in China is soon to occur, and poses several challenges for the Xi Jinping administration in its third term. As described below, each of the challenges is hard to solve for the Xi Jinping administration—which is said to have solidified its power at the 20th National Congress of the Communist Party in October 2022—and has the potential to result in the slowdown of the Chinese economy and, ultimately, question the raison d'être of the Party.

The first challenge is widening regional inequality. Fixing this is one of the most important policy issues for the Communist Party of China and the government of China. The government has already taken on large-scale projects (China Western Development, Revitalize Northeast China, and Rise of Central China) to mend the situation, but now that the internal rate of return on infrastructure investments in China has dropped to 3–6% from the previous 7–15%[(65)], it is difficult to develop the less-developed regions by large-scale infrastructure investment.

Private-sector investments that do not rely on infrastructure investments are urgently needed to address this issue. Benefited from its cool climate, Guizhou Province has turned into a data center hub, and its urban population doubled to 20.51 million in 2020 from 11.74 million in 2010. Nonetheless, not all areas facing population decline are able to follow its success. It is not easy to attract private investment to depopulated areas in any country.

The problem of regional inequality was not ap-

parent when the Chinese economy showed high growth, and even regions that lagged behind could expect high economic growth. However, when growth decelerates, these regions start to fear being left behind, and this becomes truly problematic. Regional economic disparities often lead to ethnic and religious issues and, as a result, can divide and destabilize society.

The second challenge is shrinking human resources that will lead the next generation. According to the International Monetary Fund (IMF), the total factor productivity (TFP) in China during the 2010s grew by just 0.7% year on year (annual average), remarkably slower than 3.5% in the 2000s (IMF [2022]). The TFP refers to the qualitative growth of economy, such as technological advances and greater production efficiency, and is not ascribable to the quantitative growth of production factors such as capital and labor inputs. When the working-age population no longer increases, it is advisable to consider how to efficiently leverage the existing working-age population to raise the TFP.

The reality is, however, that the youth unemployment rate in China remains high, and it is forecast that one in five young Chinese will be unemployed for the next 10 years (Miura [2022b]). Even while the size of the working-age population can be maintained by raising the statutory retirement age, unemployment among the digital natives who will shape the future causes a large opportunity cost. To make matters worse, despite "*tang ping* (lying flat)" (living a less materialistic life and forgoing competition, hard work, marriage and childbirth) already becoming a trend among the younger generation, the Communist Party unilaterally considers it "weakening."

The third is the stagnation of personal consumption in response to the heightened uncertainty. The Xi Jinping administration has managed the Chinese economy while facing the particularly tough challenges of an ever-intensifying confrontation with the United States, the heightened risk of a property bubble collapse, and the economic slowdown due to the government's zero-COVID policy. Furthermore, headlines that China's population is starting to decrease were seen at the beginning of 2023 and are sure to magnify the uncertainty.

People in China already feel uncertain about the future at an unprecedentedly high level. According to the Urban Depositor Survey Report published by the People's Bank of China, as many as 58.3% of the respondents answered they would prioritize saving over consumption in June 2022, hitting a record high. Their reason for accumulating savings is to prepare for a possible deterioration of the employment situation. A survey in September 2022 also saw the percentage of respondents answering that the employment situation would improve slip below 10% for the first time, at 9.7%.

It can be inferred from these two figures that many Chinese not only expect the environment of the Chinese economy to worsen even further going forward, but also worry whether Xi Jinping's government can overcome that hardship. The easing of various restrictions reflecting the winding down of the zero-COVID policy in December 2022 may resolve their fears in the long term while it may amplify their fears in the short term in reaction to more infections and deaths reported. Still, even if China successfully transitions from "zero-COVID" to "living with COVID," it is doubtful that consumption will drive the Chinese economy.

In spite of population aging, the propensity to consume is decreasing in China. In general, since the elderly have less need for savings, population aging should cause the figure to rise (Cabinet Office [2011]). For China, on the contrary, the percentage of disposable income spent on consumption dropped from 73.6% in 2010 to 63.9% in 2021, down 9.7% points. The situation in China is abnormal in that population aging has not boosted the propensity to consume; there is no reason for households that are becoming anxious about the future to prioritize consumption over saving.

Stagnant personal consumption is putting downward pressure on the Chinese economy. Furthermore, it prevents the Chinese economy from shifting from the current investment-driven economy to a stable consumption-driven economy. The Xi Jinping administration, starting its third term by filling top positions with Xi's aides, is said to have solidified its dominance in politics. Nevertheless,

struggling to maintain sustainable growth to retain public support, Xi Jinping's government is certain to undergo its toughest five-year term.

End Notes

1. Total fertility rate for 2010 was said to be 1.18 initially according to the Sixth Population Census. However, it was revised to 1.64, based on the results of a sampling survey on nationwide birth status conducted in 2017. Refer to *Comparing the Sixth Population Census in 2010 and the Seventh Population Census in 2020: Which was higher in birthrate?* May 3, 2022, qq.com (https://new.qq.com/omn/20220503/ 20220503A06TEZ00.html)

2. *What changes have we seen in the population scale and composition of young people?* July 22, 2022, huxiu.com (https://www.huxiu.com/article/619205.html)

3. *Comments by demographer Yuan Xin: Net population increase of 480,000 was reported in 2021. How should we see the inflection in China's population?* January 17, 2022, SOHU.com (https://www. sohu.com/a/517253347_114988)

4. *2021 birthrate may have gone below 1.3. What are more effective maternity incentives? <<Delivering babies in the new era>>*, January 18, 2022, jiemian.com (https://www.jiemian.com/article/7025052.html)

5. *Seventh Population Census: Difference of 10 million people between the population of 0 years old ~ 14 years old and the cumulative total? The National Bureau of Statistics << There were missing samples in past reports and there were errors in estimation>>*, May 13, 2021, jiemian.com (https://www.jiemian.com/article/6084855.html)

6. *Inconsistency in the Population Census: Gap between the youth population and cumulative data? The National Bureau of Statistics responded*, May 14, 2021, qq.com (https://new.qq.com/omn/20210514/20210514A04Z4W00.html)

7. *Question about the Chinese National Census: Population of 14 years old or younger exceeded the cumulative number of births. The National Bureau of Statistics <<We did not make any adjustments>>*, May 12, 2021, Nikkei (https://www.nikkei.com/article/DGXZQOGM123E80S1A510C2000000/)

8. For example, the population of China in 2020 was 1,411,780,000 according to flash data from the Census. As a reference, the population was 1,410,080,000 according to the "2021 Statistical Yearbook" and 1,409,780,000 according to the "2022 Population Census Almanac of China."

9. The United Nations calculates its own figures based on estimates concerning past population statistics, not merely using raw data gathered from each country as is. On the other hand, concerning future population statistics, it releases its own outlook as a projection. Refer to Hiroshi Kawabe [1992] for details.

10. *Green Book of Population and Labor: Reports on China's Population and Labor No.19 promulgated*, January 4, 2019, CHINESE SOCIAL SCIENCES NET (http://news.cssn.cn/zx/bwyc/201901/t20190104_ 4806519.shtml). *Green Book of Population and Labor: Reports on China's Population and Labor* has been published every year since then, with a special subject covered in each issue; for instance, "Employment" in No.20 in 2020; "Human capital" in No.21 in 2021; and "Urbanization" in No.22 in 2022. However, it does not contain any long-term population outlook.

11. *Net increase of 480,000 in the nationwide population was seen in 2021: the 3-baby policy is gradually proving its effect!* January 17, 2022, CAIJING.COM.CN (http://58cjw.cn/redian/11627.html)

12. *Average age of first marriage is 28.67 in China: Aren't you raising the average level?* June 25, 2022, SOHU.com (https://www.sohu.com/ a/560742121_120546417). *10% is the share of women delivering their first baby at an older age (35 years old or older) in our country; experts advising childbearing-age women not to pass the golden line*, August 10, 2020, Shanghai Observer (https://export.shobserver.com/baijiahao/html/278129.html)

13. In 2009, the average age of first marriage was 28.6 and the average age of first birth was 29.7 for Japanese women. Refer to "2009 Overview of Demographic Statistics (Confirmed)" of the Ministry of Health, Labour and Welfare (https://www.mhlw.go.jp/toukei/saikin/hw/jinkou/kakutei09/index.html) for details.

14. *Press conference by the Director of the National Bureau of Statistics of China on the national economic situation in 2021 (Q&A)*, January 17, 2022, the National Bureau of Statistics of China (http://www.stats.gov.cn/tjsj/sjjd/202201/t20220117_1826479.html)

15. A number of regions recorded the highest number of new infections during November and December 2022. Specifically, they are nine provinces and directly governed cities of Beijing City (November 29), Hebei Province (November 24), Shanxi Province (November 25), Heilongjiang Province (November 25), Zhejiang Province (December 12), Guangdong Province (December 5), Chongqing City (December 5), Sichuan Province (November 22), and Yunnan Province (December 1).

16. *Notification on further easing of COVID-19 prevention measures*, December 7, 2022, www.GOV.cn (http://www.gov.cn/xinwen/2022-12/07/content_5730443.htm)

17. *Economic Blue Paper: China's economic growth rate for 2023 forecasted to be around 5.1%*, December 13, 2022, Sina (https://news.sina.com.cn/o/2022-12-13/doc-imxwpmmx6241566.shtml#/)

18. *Xi Jinping, Li Keqiang, and Li Qiang made important speeches at the Central Economic Work Conference held in Beijing, and Zhao Leji, Wang Huning, Han Zheng, Cai Qi, Ding Xuexiang and Lee Xi attended the meeting*, December 16, 2022, www.12371.cn (https://www.12371.cn/2022/12/16/ARTI1671193528795538.shtml)

19. *(Inner voice at the "front line of pandemic control") There's no time to spare in the vaccination of the elderly*, December 7, 2022, SOHU.com (https://www.sohu.com/a/614564604_349336)

20. *How many children is ideal for a family? A study by Fudan University reveals the ideal number of children is further decreasing. The average ideal number of children is 1.59*, November 22, 2022, wenhui.whb.cn (https://wenhui.whb.cn/third/baidu/202011/22/381187.html)

21. *Is the cost raising a child until they graduate from university 627 thousand yuan? Ren Zeping publishes an important report*, October 6, 2022, qq.com, (https://new.qq.com/rain/a/20221006A07MNC00)

22. *Labor law of China (Shanghai)*, Tada International Labor and Social Security Attorney Corporation (https://www.tk-sr.jp/business/asia_employment/shanghai/index4_11.html, accessed on November 11, 2022), *Introduction of childcare leave in China*, January 25, 2022, TMI Associates (https://www.tmi.gr.jp/uploads/2022/01/25/Childcare_Leave_of_China.pdf)

23. *Survey on views of young people on marriage and love: What are the worries of young people about marriage?* October 8, 2021, Gmw.cn (https://m.gmw.cn/2021-10/08/content_1302631544.htm)

24. *No child. No spouse. More women are choosing to stay single in Europe! Are unmarried women with no children the happiest?* August 28, 2022, NetEase (https://www.163.com/dy/article/HFSRS7I305148KED.html)

25. *Proposed amendment of the Population and Family Planning Law of the People's Republic of China was passed (the Order of President No.41) at the Standing Committee of the National People's Congress*, December 28, 2015, www.GOV.cn (http://www.gov.cn/zhengce/2015-12/28/content_5029897.htm)

26. *Central Committee of the Communist Party of China and State Council: Decision Regarding the Optimization of the Childbirth Policy and the Promotion of Developing a Balanced Population Over a Long Term*, July 21, 2021, www.GOV.cn (http://www.gov.cn/xinwen/2021-07/20/content_5626190.htm)

27. *Households with one child receive blessings. They can receive three major subsidies and two support measures if they qualify*, October 5, 2021, SOHU.com (https://www.sohu.com/a/493621067_120487031)

28. *What is the "one-child penalty?"* January 5, 2022, hualv.com (https://lawyers.66law.cn/s2a085300e3f51_i1093836.aspx)

29. *Second child penalty criteria stipulated by each province*, June 16, 2022, hualv.com (https://www.66law.cn/laws/12141.aspx)

30. *No penalty on having a second child in 2022. Third-child penalty criteria*, November 1, 2022, hualv.com (https://www.66law.cn/laws/8111.aspx)

31. *China needs to boost its population, so why not scrap birth caps entirely? The reason might be Xinjiang*, June 20, 2021, CNN (https://www.cnn.co.jp/world/35172627.html)

32. Same as Note 26.

33. *Proposed amendment of the Population and Family Planning Law of the People's Republic of China was passed at the Standing Committee of the National People's Congress*, August 20, 2021, www.GOV.cn (http://www.gov.cn/xinwen/2021-08/20/content_5632426.htm)

34. *The latest 2022 nationwide standard for marriage, childbirth, and child-rearing leaves will come into force on November 1!* October 27, 2022, SOHU.com (https://www.sohu.com/a/600203655_121123710)

35. *Zhejiang Province extends the period of childbirth leave: 158 days in total for birth of first children, and 188 days for second and third children*, November 25, 2022, NetEase (https://www.163.com/money/article/GPLI2DA900259DLP.html)

36. Urban Workers' Basic Medical Insurance is a "higher coverage with higher cost" type of public medical insurance, which also covers childbirth expenses. People enrolled in this insurance are mostly employees of state-owned companies. Note that the urban social insurance system in China, which is mainly for employees of state-owned companies, had been referred to as the "Five Types of Insurance and One Fund," which consist of 1) pension (endowment) insurance, 2) medical insurance, 3) unemployment insurance, 4) work injury insurance, 5) childbirth insurance, and 6) housing provident fund. However, in June 2017, childbirth insurance was integrated into medical insurance, and the system became "Four Types of Insurance and One Fund." For details, refer to *Circular of the State Council on the promulgation of the trial bill on integrating childbirth/child-rearing insurance and employee basic medical insurance*, February 4, 2017, The Ministry of Human Resources and Social Security of the People's Republic of China (http://www.mohrss.gov.cn/SYrlzyhshbzb/dongtaixinwen/shizhengyaowen/201702/t20170204_265754.html)

37. Urban and Rural Resident Basic Medical Insurance is a "low coverage with low cost" type of public medical insurance, which also covers childbirth expenses. People enrolled in this insurance are those who are not eligible for Urban Employee Basic Medical Insurance.

38. *The Central Committee of the Communist Party of China and State Council circulate opinions on the adjustment and establishment of a childbirth policy*, December 30, 2013, www.GOV.cn (http://www.gov.cn/gongbao/content/2014/content_2561278.htm)

39. *National Health and Family Planning Commission: China's total population is forecast to reach its peak of approximately 1.45 billion people in 2030*, January 12, 2016, people.cn (http://scitech.people.com.cn/n1/2016/0112/c1057-28042277.html)

40. *Remarks by Cai Fang on the population policy: How to adjust the existing policy*, March 21, 2011, Sina Finance, (http://finance.sina.com.cn/economist/jingjiguancha/20110321/01149562675.shtml)

41. *Receive a subsidy if you give birth, and a monthly subsidy for second and third children! A county in Shaanxi Province uses a new method to encourage childbirth*, November 18, 2022, SOHU.com (https://www.sohu.com/a/607309832_121264865)

42. *A 2,000-yuan subsidy for giving birth to a child in Ningshan County in Shaanxi Province. The birthrate of third children increases by 168.4% in Panzhihua City in Sichuan Province*, November 11, 2022, SOHU.com (https://baobao.sohu.com/a/604693859_491157)

43. *Zhengguan webcast critique: Although the 10,000-yuan one-time subsidy for third children is too small, it should receive more praise*, October 14, 2022, qq.com (https://new.qq.com/rain/a/20221014A05UFL00)

44. *The Central Committee of the Communist Party of China and State Council circulate the opinions on reducing the burden of homework and out-of-school education on students in compulsory education*, July 24, 2021, www.GOV.cn (http://www.gov.cn/zhengce/2021-07/24/content_5627132.htm)

45. The housing price of Jiaxing in December 2021 was 13,202 yuan per square meter. For details, see *2021 Housing Prices in Jiaxing City*, anjuke.com (https://www.anjuke.com/fangjia/jx2021/, Accessed on November 22, 2022)

46. *Statistical Communiqué of the People's Republic of China on the 2021 National Economic and Social Development*, February 28, 2022, www.GOV.cn (http://www.gov.cn/xinwen/2022-02/28/content_5676015.htm)

47. *National Health Commission and Ministry of Housing and Urban-Rural Development plan to build/procure 8.7 million units of security rental housing during the period of the 14th Five-Year Plan. 17 departments including National Health Commission are shifting toward placing the focus of their housing policy on households with multiple children*, August 22, 2022, SOHU.com (https://www.sohu.com/a/578947392_121123809)

48. *Provide money for giving birth: multiple provinces and cities propose the creation of a childcare allowance system*, August 9, 2022, Sina Finance (https://finance.sina.com.cn/wm/2022-08-09/doc-imizmscv5526603.shtml)

49. *Report on the forecast of China's population published by Liang Jianzhang: The number of births could drop to around 10 million in 2021*, December 31, 2021, qq.com (https://new.qq.com/rain/a/20211231A0826D00)

50. *Will the employment discrimination against women intensify with the extension of childbirth leave?* March 4, 2022, SOHU.com (https://www.sohu.com/a/527212799_220095)

51. *Do not have high hopes for people born in the 1990s and 2000s! Ren Zeping proposes that the People's Bank of China (the central bank) print an extra two trillion yuan to use for encouraging childbirth*, January 10, 2022, qq.com (https://view.inews.qq.com/k/20220110A0CRNX00)

52. *Did the Chinese authority call a newlywed woman to promote pregnancy? A post on social media went viral before being deleted*, October 2, 2022, Reuters (https://jp.reuters.com/article/china-women-idJPKBN2RN0F3)

53. *In 2040, population of China will become about 1,345 million and urbanization rate will reach 78.6%. It is expected that of the increment in urban population, the metropolitan area of Shanghai will account for the largest portion of the annual average increase*, May 8, 2022, NetEase (https://www.163.com/dy/article/H6ROBN5Q0519QIKK.html)

54. Shanxi and Inner Mongolia produced 29.4% and 25.3% of China's raw coal.

55. Kumakura [2022] concludes that the policy of encouraging migration of Han Chinese into the Xinjiang Uyghur Autonomous Region has been effective.

56. The dependency ratio, which is the ratio of the youth and elderly populations to the working-age population, is an indicator of the social and economic burden borne by the working-age population.

57. *Writing a new chapter on the population in the new era*, August 1, 2022, qstheory.cn (http://www.qstheory.cn/dukan/qs/2022-08/01/c_1128878530.htm)

58. Although the World Health Organization (WHO) defines the working-age population as those 15-64 years old and the elderly population as those 65 years old or above, the population aged 60 or older is considered the elderly here, taking the statutory retirement ages in China (60 for men and 55 for women) into account.

59. *List of the public pension schemes in Japan*, Ministry of Health, Labour and Welfare (https://www.mhlw.go.jp/content/12500000/000925920.pdf, accessed on December 2, 2022)

60. *State Council's report on the reinforcement and promotion of countermeasures against population aging, at the 36th session of the 13th NPC Standing Committee on August 30, 2022*, August 31, 2022, National Health Commission (http://www.npc.gov.cn/npc/c30834/202208/889a7e67a7794176b3a718f972447cac.shtml)

61. *State Council's notification on establishing a central coordination system for the Urban Employees' Pension Scheme reserve fund*, June 13, 2018, www.GOV.cn (http://www.gov.cn/zhengce/content/2018-06/13/content_5298277.htm)

62. *The act on the implementation of Jiangsu Province Urban Employees' Pension Scheme to be enforced on March 1*, February 21, 2022, SOHU.com (https://www.sohu.com/a/524350621_362042)

63. *Opinion poll jointly conducted by Dataway and Sohu: nearly 90% of Internet users are clearly against the retirement age extension*, December 28, 2015, SOHU.com (http://news.sohu.com/20151228/n432740689.shtml)

64. *Shangzhi Fengyuan: Pension fund to run out in 2035? A leading expert of the Ministry of Human Resources and Social Security explains!* July 22, 2019, NetEase (https://www.163.com/dy/article/EKMQ5T9F053814UU.html)

65. *Infrastructure: still performing very well making use of the REIT market*, China International Capital Corporation Limited (https://research.cicc.com/frontend/recommend/detail?id=3201, accessed on December 5, 2022)

References

(Japanese)

1. Akutsu, Fumika [2017]. "*Population censuses in the world, focusing on those of Japan, the United States and the United Kingdom,*" Advances in Social Research No.19 September 2017, Japanese Association for Social Research. (https://jasr.or.jp/wp/asr/asrpdf/asr19/asr19_080.pdf)

2. Kawabe, Hiroshi [1992]. *The Future Population of the World and Japan*, Journal of Geography Volume 101 Issue 6, Tokyo Geographical Society. (https://www.jstage.jst.go.jp/article/jgeography1889/101/6/101_6_539/_pdf)

3. Kajitani, Kai [2018]. "*Lecture on the Chinese economy: from the credibility of its statistics to the prospects of growth*," Chuokoron Shinsho, Chuokoron Shinsha.

4. Kuroda, Haruhiko [2019]. *Demographic Changes and Macroeconomic Challenges*, Bank of Japan. (https://www.boj.or.jp/announcements/press/koen_2019/data/ko190117b.pdf)

5. Kumakura, Jun [2022]. "*Xinjiang Uyghur Autonomous Region—70 years of Chinese Communist rule*," Chuokoron Shinsho, Chuokoron Shinsha.

6. Japan Center for Economic Research [2019]. *US and China Rival in GDP while Japan Ranks Fifth in 2060*, 2060 Digital & Global Economy, Long-term Economic Forecast 2019-2060. (https://www.jcer.or.jp/jcer_download_log.php?f=eyJwb3N0X2lkIjo0ODUxNywiZmlsZV9wb3N0X2lkIjo0ODg4MX0=&post_id=48517&file_post_id=48881)

7. Saruyama, Sumio; and Tahara, Kengo [2019]. *US and China to fight for top GDP in 2060 while Japan dips to 5th*, July 26, 2019, Nihon Keizai Shimbun. (https://www.nikkei.com/article/DGXKZO47775960V20C19A7KE8000/)

8. Cabinet Office [2003]. *Annual Report on the Japanese Economy and Public Finance 2003*. (https://www5.cao.go.jp/j-j/wp/wp-je03/03-00000pdf.html)

9. ——[2011]. "*Regional economy of Japan 2011—reconstruction from the earthquake, revitalization of regions—*." (https://www5.cao.go.jp/j-j/cr/cr11/chr11_index.html)

10. ——[2015]. "*Choice for the future— future outlook indicated by population projections—*." (https://www5.cao.go.jp/keizai-shimon/kaigi/special/future/sentaku/index.html)

11. Japan Business Federation [2008]. *An Economy and Society That Responds to the Challenges of a Declining Population*. (https://www.keidanren.or.jp/japanese/policy/2008/073.pdf)

12. Fukuda, Shin-ichi [2017]. *Macroeconomic Effects of Population Decline on Economic Growth*, Economic Analysis No. 196, Cabinet Office Economic and Social Research Institute. (https://www.esri.cao.go.jp/jp/esri/archive/bun/bun196/bun196b.pdf)

13. Miura, Yuji [2013]. "*The credibility of local GDP statistics in China*," RIM Pacific Business and Industries Vol. XIII No. 48., Japan Research Institute. (https://www.jri.co.jp/MediaLibrary/file/report/rim/pdf/6584.pdf)

14. ——[2021]. *Limitations of China's Growth Patterns Revealed by Excess Debt —SOE and housing speculation threaten the feet of the Xi Jinping administration—*, RIM Pacific Business and Industries Vol. XXI No.83., Japan Research Institute.

15. ——[2022a]. *The Reality of "Common Prosperity" Advocated by the Xi Jinping Administration*, RIM Pacific Business and Industries Vol. XXII No. 84., Japan Research Institute. (https://www.jri.co.jp/MediaLibrary/file/report/rim/pdf/13190.pdf)

16. ——[2022b]. "*The background to China's rising youth unemployment*," RIM Pacific Business and Industries Vol. XXII No. 87., Japan Research Institute. (https://www.jri.co.jp/MediaLibrary/file/report/rim/pdf/13795.pdf)

17. Li, Lianhua; and Zhang, Jiyuan [2021]. *Childcare Policy in China*, Journal of Social Security Research Vol. 6 No. 4 (No.23), National Institute of Population and Social Security Research. (https://www.ipss.go.jp/syoushika/bunken/sakuin/kikanshi/0604.htm)

(English)

18. Center for Strategic & International Studies [2022]. *China's Demographic Trends in the Context of Economic Competition*. (https://www.csis.org/blogs/new-perspectives-asia/chinas-demographic-trends-context-economic-competition-%E2%80%AF)

19. IMF [2022]. *2021 Article IV Consultation—Press Release; Staff Report; and Statement by the Executive Director for The People's Republic of China*. (https://www.imf.org/en/Publications/CR/Issues/2022/01/26/Peoples-Republic-of-China-2021-Article-IV-Consultation-Press-Release-Staff-Report-and-512248)

20. Kuijs, Luis [2022]. *Economic Research: China's Trend Growth To Slow Even As Catchup Continues*, S&P Global Ratings. (https://www.spglobal.com/ratings/en/research/articles/221110-economic-research-china-s-trend-growth-to-slow-even-as-catchup-continues-12550713)

21. OECD [2021]. *Pensions at a Glance 2021: Country Report-China*. (https://www.oecd.org/publications/oecd-pensions-at-a-glance-19991363.htm)

(Chinese)

22. National Bureau of Statistics of China [2012]. *The Sixth National Population Census*, China Statistics Press.

23. ——[2021a]. *Major Figures on 2020 Population Census of China*. (http://www.stats.gov.cn/tjsj/pcsj/rkpc/d7c/202111/P020211126523667366751.pdf)

24. ——[2021b]. *China Statistical Yearbook 2021*. (http://www.stats.gov.cn/tjsj/ndsj/2021/indexch.htm)

25. ——[2022]. *The Seventh National Population Census*, China Statistics Press.

26. Chen, Hao; Xu, Ruihui; Tang, Tao; and Gao, Hong [2021]. "*China's awareness of its demographic shift and countermeasures*," PBC Working Paper No.2021/2. (http://www.pbc.gov.cn/yanjiuju/124427/133100/4214199/4215384/2021032618390757190.pdf)

Disclaimer:
This report is intended solely for informational purposes and should not be interpreted as an inducement to trade in any way. All information in this report is provided "as is", with no guarantee of completeness, accuracy, timeliness or of the results obtained from the use of this information, and without warranty of any kind, express or implied, including, but not limited to warranties of performance, merchantability and fitness for a particular purpose. In no event will JRI, its officers or employees and its interviewee be liable to you or anyone else for any decision made or action taken in reliance on the information in this report or for any damages, even if we are advised of the possibility of such damages. JRI reserves the right to suspend operation of, or change the contents of, the report at any time without prior notification. JRI is not obliged to alter or update the information in the report, including without limitation any projection or other forward looking statement contained therein.