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# How Long will China's Demographic Dividend Continue? —A Question with Implications for Sustainable Economic Growth—

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## Summary

1. This article examines the impact of demographic changes on economic growth in China.
2. A feature of population dynamics in China has been the rapid transition from a high fertility and high mortality to low fertility and low mortality. The total fertility rate (the number of children born in a woman's lifetime) has already fallen to 1.6, which is comparable to levels in advanced economies. The aging ratio was in excess of 8% by 2009, and demographic aging is expected to accelerate in the future.
3. China's productive age population (15-64) will soon pass its peak. According to the demographic dividend theory, which states that increases in the productive age population cause economic growth to accelerate, China's latent growth potential will start to wane from 2015 onwards.
4. Yet the Chinese economy shows no signs of slowing down. To assess the effects of the demographic dividend in China, we also need to take into account the rapid expansion of real labor inputs resulting from the mass-migration of surplus labor from inland and rural areas into coastal and urban areas. If this utilization of surplus labor from inland and rural regions continues, China will continue to enjoy a demographic dividend for longer than has been estimated on the basis of population dynamics.
5. However, China's surplus labor resources are not infinite. Nor will it be possible to utilize all surplus labor. Of particular significance is the fact that the first generation of baby boomers, who make up a significant percentage of the surplus labor force, will soon be in their fifties. The capacity of people in this generation to migrate from inland and rural areas into coastal and urban areas will decline as they grow older, and it will also become more difficult for them to move from agriculture into the manufacturing and service sectors. In other words, labor shortages could become a problem in coastal and urban areas even while there is still a large surplus labor force in inland and rural areas. Furthermore, the working population and labor inputs will shrink rapidly when it becomes necessary for people in this generation to withdraw from the work force. This indicates that China will need to take immediate action to lift the productivity of its first baby boom generation if it is to continue to achieve sustainable economic growth.
6. China is a vast country, and there is likely to be regional variation in the benefits provided by the demographic dividend. Coastal and urban areas have benefited considerably and over an extended period because of population inflows, but in inland and rural areas the demographic dividend has been curtailed by population outflows, with the result that these regions could face demographic aging while their income levels are still low. In recent years there have been signs of growth in inland and rural areas, but it is unlikely that this growth will bring any immediate alleviation of regional disparity.

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## Introduction

The Chinese economy has achieved 30 years of high growth since the launch of the reform and open-door policy in the late 1970s. Since 2000 in particular, China has established a position for itself as the world's factory through the rapid expansion of its exports of manufactured goods. China has also attracted attention as the world's market in recent years. There has been a dramatic increase in the influence of production and market trends in China on the world economy, and we can no longer forecast the global economic outlook without also forecasting trends in Chinese economy.

However, China also faces many internal issues, including income disparity and environmental and energy problems. One of these issues is the birth-rate, which has remained low for many years because of the one-child policy. There is increasing debate about how economic growth will be affected by a falling birthrate and demographic aging, as has happened in Japan.

In 2009 China's demographic aging ratio (the percentage of the population aged 65 or older) stood at 8.5%, and its aged population reached 113 million people. If the birthrate remains at its present low level, China is expected to become a depopulating society by 2030.

In recent years, the concept of a "demographic dividend," whereby economic growth is boosted by changes in demographic composition, has been used frequently in assessments of the impact of demographic change on economic growth. According to this concept, China's productive age population (those aged 15-64) will peak as a percentage of the total population in 2015, and China's potential growth capacity will start to weaken shortly thereafter. However, there are currently no signs that China's economic growth is about to shift to a decelerating trend, and while a population decline is seen as inevitable in the future, there is no evidence at present that labor shortages are becoming more serious. In fact, China is more challenged at present by the task of finding employment for its young people.

Before we can apply the concept of the demographic dividend to China, we need to modify it

somewhat. This is because the demographic dividend theory assumes a situation of full employment, whereby trends in the working-age population match trends in the labor force. However, China has an underemployment situation caused by the existence of large populations of surplus labor in inland and rural areas. From the mid-1990s onward, China has been in transition to a full employment situation as surplus labor is absorbed through migration to coastal and urban areas.

Can we explain China's high growth in recent years by adjusting the demographic dividend concept to reflect these shifts in the labor market? What is the economic outlook, and what does China need to do to achieve sustainable growth? These are the questions that we will consider in this article. We will also look at the effects of productivity differences between age groups and regional variation in population composition, which have not been analyzed extensively in the past in relation to the demographic dividend concept.

The analysis of China's demographic situation in Part 1 of this article identifies a number of trends. First, the birth rate has fallen rapidly since the 1970s, and fertility is now so low that China can be regarded as a low-birthrate society. Second, rapid demographic changes have created a baby boom generation. Third, demographic aging is likely to advance at an accelerating pace in the future.

In Part 2, we will examine the concept of a demographic dividend and look at the timeframe over which its benefits can be received. We will clarify the characteristics of the demographic dividend in China, which has surplus labor in inland and rural regions, through a comparison with the full employment situation achieved in South Korea.

In Part 3, we will analyze the distribution of surplus labor in inland and rural areas by age group. We will look in particular at the impact of the declining capacity of the first baby boom generation on sustainable growth.

In Part 4 we will show how an upsurge in migration over the past few years has caused regional disparity in the demographic dividend, and how this situation is likely to frustrate efforts to reduce regional economic disparity.

## 1. China's Aging Population and Low Birth Rate

### (1) From High Fertility and High Mortality to Low Fertility and Low Mortality

We will begin with an overview of population dynamics in China. A country's population dynamics are affected by (1) changes in fertility, (2) changes in mortality, and (3) net migration to and from other countries. However, migration has only a small influence on population change, and changes in population growth rates are generally explained in terms of fertility and mortality rates.

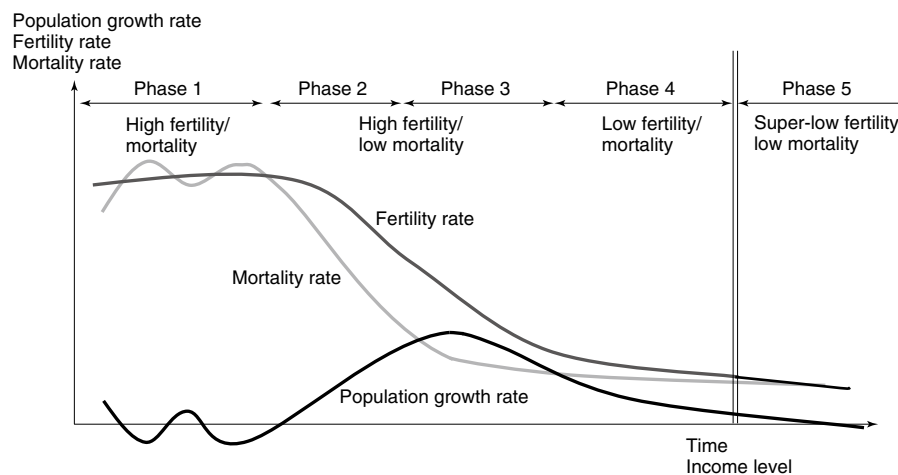
One of the tools used to explain the mechanisms of population dynamics is the demographic transition model (Fig. 1). According to this model, rising income levels are accompanied by a transition from (1) high fertility and high mortality to (2) high fertility and low mortality and (3) low fertility and low mortality. The high-fertility, low-mortality stage is divided into two phases. First the death rate rapidly falls below the birthrate, leading to a rise in the population growth rate. Second, an accelerating decline in the birthrate leads to a fall in the population growth rate. (The fifth phase in Fig. 1 will be discussed later.)

Fig. 2 analyzes China's population dynamics using the same approach as the demographic tran-

sition model. While not as clear-cut as the demographic transition model, this analysis confirms that China's population dynamics have moved from high fertility and high mortality to low fertility and low mortality. In 2009, its crude fertility rate (births per 1,000 of population, ‰) was similar to that of developed nations at 12.1‰. World crude fertility rates are 12‰ for high-income countries, 19‰ for middle-income countries and 32‰ for low-income countries (World Bank [2010]).

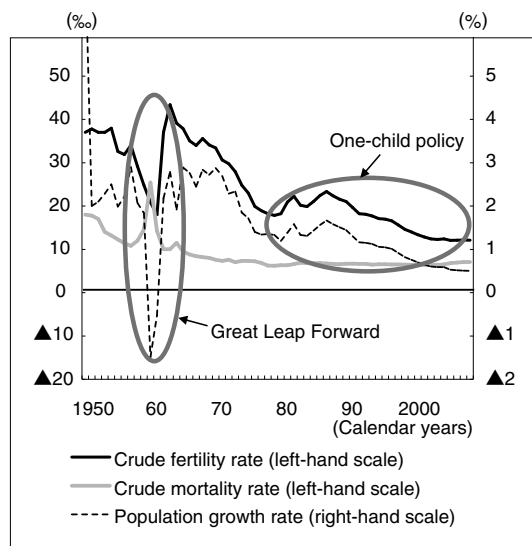
One of the characteristics of China's population dynamics was a dramatic rise in the crude mortality rate during the late 1950s and early 1960s, leading to a fall in the crude fertility rate. This pattern resulted from the failure of the policy known as the "Great Leap Forward," which led to the breakdown of food distribution channels and ultimately caused the loss of 40 million lives. After this sudden rise in the mortality rate, there was a rapid increase in the fertility rate, which reached a peak of 43.4‰ in 1963, when the total fertility rate hit 7.5. Historical experience suggests that increases in mortality as a result of disease, war or other factors are followed immediately by increases in fertility, as if in compensation for the losses. During the first half of the 1960s, China's fertility rate followed this pattern, and by 1970 it was above 30‰. The trend was reversed in the 1970s,

**Fig. 1 The Demographic Transition Model**



Source: JRI

**Fig. 2 China's Population Dynamics (1951-2009)**



Source: China Statistical Yearbook

when a rapid downward trend reduced the fertility rate to 20‰ by 1976. This process resulted in the formation of a baby boom generation consisting of people born between 1963 and 1971 (Fig. 3). Those in this first baby boom generation, who account for 20.7% of China's total population, were aged between 39 and 47 in 2010. The children of

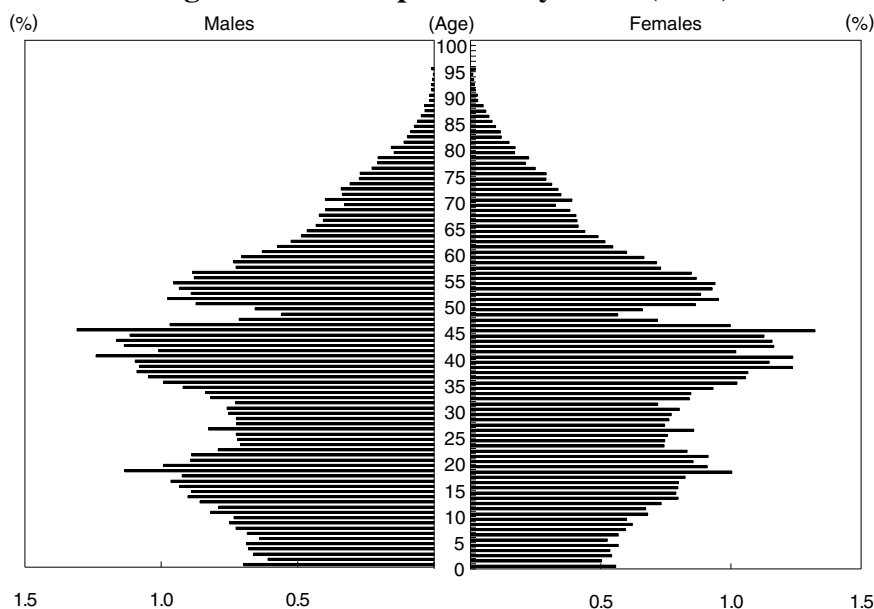
the first baby boom generation have formed a second baby boom generation, aged between 17 and 22 in 2010.

## (2) Fall in Fertility Rate at National Level

Factors linked to falling fertility rates in developing countries include rising income levels, increases in the cost of educating children, a declining reliance on the agricultural sector, in which children are seen as a labor resource, and growing social participation by women. In China, however, the efforts of the state since the late 1970s to curb population growth through the one-child policy have played a major role in reducing the fertility rate.

The one-child policy was introduced in 1982 as a way of reducing population growth by encouraging people to marry later, give birth later and have fewer children. The key components of the policy were an increase in the legal age for marriage under the Marriage Law of the People's Republic of China, and the imposition of mandatory family planning. Married couples that declared their intention to have only one child were given certificates that entitled them to a range of ben-

**Fig. 3 China's Population Pyramid (2008)**



Source: China's Demographic Yearbook

efits, including scholarship payments, prioritized enrolment of their children in daycare facilities and schools, subsidies for childcare and education expenses, and healthcare payments. Those who broke the one-child rule were subject to various sanctions, including maternity surcharges, “social fostering” fees, wage reductions and exclusion from job promotions (Wakabayashi, K. [2005]).

Of course, the policy has not been implemented uniformly across China. Compared with coastal regions, urban areas and Han (Chinese) ethnic groups, the rules have generally been applied less stringently to rural communities, ethnic minorities and inland regions (Wakabayashi, K. [2010]). The fall in fertility has been especially dramatic in urban areas, where the policy has been rigorously enforced. For example, the total fertility rate for Shanghai fell below 1.0 in 1994 and was significantly lower than Japan’s rate at 0.88 in 2008 (Fig. 4).

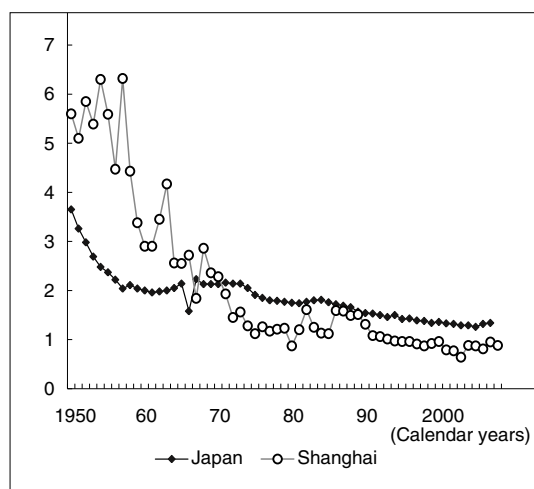
While there is regional variation in the fertility rate, it is generally low throughout China. Fig. 5 provides an overview of crude fertility rates for the 333 prefecture-level cities and four directly-controlled municipalities<sup>(1)</sup>. The crude fertility rate has exceeded 20‰ in only 11 of these areas, most of which are in the western regions, including

Xinjiang Uighur Autonomous Region, the Tibet Autonomous Region, Qinghai Province and Yunnan Province. The crude fertility rate is between 15 and 20‰ in 36 cities, between 10 and 15‰ in 180, and below 10‰ in 110. The fact that China’s fertility rate at the national level is similar to levels in developed countries has important implications for labor supply and demand in the future.

In the final phase of the demographic transition model, when both fertility and mortality rates are consistently low, the population growth rate also stabilizes. The fertility rate at this stage is likely to be around 15‰, a level that China reached in the 1990s. As in the developed countries, China has not halted the decline in its fertility rate. Its total fertility rate was below 1.6 in 2009, and if it remains at this low level, China’s population can be expected to shift to a downward trend in 2030. A country with a fertility rate so low that the population starts to decline is in a sub-replacement situation and should be seen as having entered the fifth of the phases shown in Fig. 1, which should in fact be seen as a second demographic transition (Kono [2007]).

Despite the fact that its fertility rate has fallen to the same level as in developed countries, the Chinese government is expected to maintain the one-child policy. In January 2007, the government promulgated the *Strategic Research Report on National Population Development* and the *Decision of the Central Committee of the Communist Party of China and the State Council on Fully Enhancing Population and Family Planning Program and Comprehensively Addressing Population Issues*, in which it indicated that the one-child policy would be maintained. The one-child policy is also likely to be retained in the 12th Five-Year Plan.

**Fig. 4 Total Fertility Rates of Japan and Shanghai**

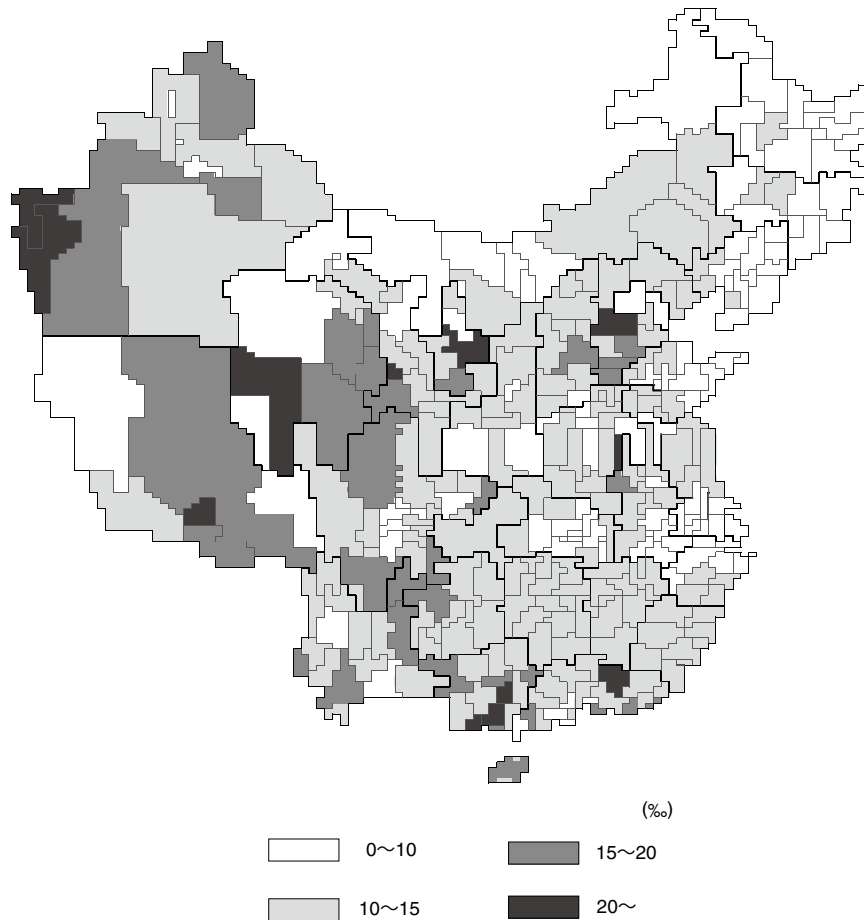


Source: *White Paper on Birthrate-Declining Society*, www.popinfo.gov.cn

### (3) Accelerating Demographic Aging

The average life expectancy at birth has meanwhile increased significantly because of the increasing availability of medical services, improved nutrition and other factors. From 40.8 in 1950-55, it has risen to 65.3 in 1975-80 and 73.0 in 2005-10. When combined with a consistently low fertility rate, this trend can be expected to trigger ac-

**Fig. 5 Regional Variation in Crude Fertility Rates in China (2008)**



Source: Compiled using National Bureau of Statistics of China, *China Statistical Yearbook for Regional Economy 2009*

celerated demographic aging.

With an aging ratio of 8.5% in 2009, China has already made the transition to an aging society<sup>(2)</sup>. The aging ratio is expected to rise at an accelerating rate, reaching 14% in 2025-30 and 20% in 2035-40. The number of years required for the aging ratio to increase from 7% to 14% is known as the “doubling period.” This period is used as a measure of the speed of demographic aging. China’s doubling period of 22-24 years is similar to Japan’s (24 years).

In 2009, China’s aged population was 113 million and is expected to climb to 200 million in 2025-30, and to over 300 million in 2035-40. With its aged population expected to increase by an average of over 3% per annum in the period to 2040.

This acceleration of demographic aging is now seen as inevitable, and some believe that China should abolish its one-child policy and raising its fertility rate in order to reduce the burden of aging. Already some regions are allowing married couples who are both without siblings to have a second child<sup>(3)</sup>. However, even if the one-child policy is abolished, leading to a rise in the fertility rate and a reduction in the aging ratio, the burden on society will not be reduced.

This can be confirmed using United Nations population statistics. Total fertility statistics compiled by the United Nations are based on medium, low and high variants, which center on rates of 1.85, 1.35 and 2.35 respectively<sup>(4)</sup>. Let us assume that China’s fertility rate would recover to the

high variant level (i.e., increase to 2.35) if the one-child policy were abolished.

A higher fertility rate would certainly reduce the speed of demographic aging. Under the low variant, China's aging ratio would reach 16.8% in 2030, compared with 15.9% under the medium variant and 15.1% under the high variant. However, this would not reduce the social burden, since a higher fertility rate would mean increased expenditure on care and education for children. Fig. 6 analyzes trends in the dependent population ratio, which consists of the aging ratio and the child population ratio (people aged 0-14).

As is clear from Fig. 6, the dependent population ratio is highest with a fertility rate based on the high variant. This is because a higher fertility rate leads to increased expenditure on child care and education, leading to a continuing rise in the burden on society.

The fertility rate may not improve significantly even if the one-child policy is abolished. Because, China is experiencing factors that have caused fertility rates to decline in other developing countries, including lifestyle changes, an increasing so-

cial emphasis on higher education, and changing attitudes to marriage.

## 2. The Demographic Dividend and the Chinese Economy

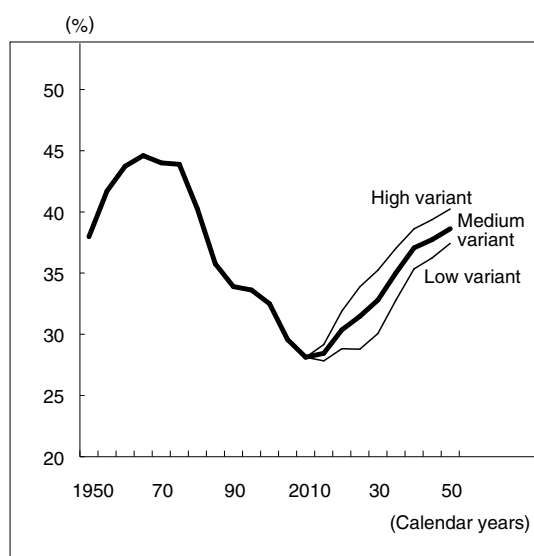
### (1) What is the Demographic Dividend?

A fall in the fertility rate does not lead immediately to demographic aging. The aging ratio does not start to rise until 30-40 years after the shift to downward movement in the fertility rate. During that time, the economic growth of developing countries will continue to benefit from the presence of large numbers of working people in their societies. This acceleration of economic growth as a result of demographic changes caused by falling fertility rates is known as the "demographic dividend." We will now use the demographic dividend concept to analyze the population-related factors that have underpinned China's economic growth in recent years, and to identify issues that could affect sustainable growth.

Two factors contribute to the demographic dividend: reduced burdens and increased production capacity (Fig. 7). The reduction of burdens results from a decline in the child population ratio. This is obvious, given the fact that developing countries with high fertility rates have large child populations, with the result that the level of savings remains low because of the heavy burden on society. One of the theories used to explain why developing countries are unable to escape from poverty is the notion of a vicious circle of poverty. Because savings are low in developing countries, investment is also low, with the result that it is impossible to raise productivity. As a result, income levels remain low. Countries tend to fall into a vicious circle, since low incomes mean low savings. One of the factors that keeps savings low is the high cost of childcare and education. The reduction of fertility rates therefore has the potential to release developing countries from the vicious circle of poverty. This was one of the motives behind the Chinese government's decision to introduce the one-child policy.

However, the social burden again starts to in-

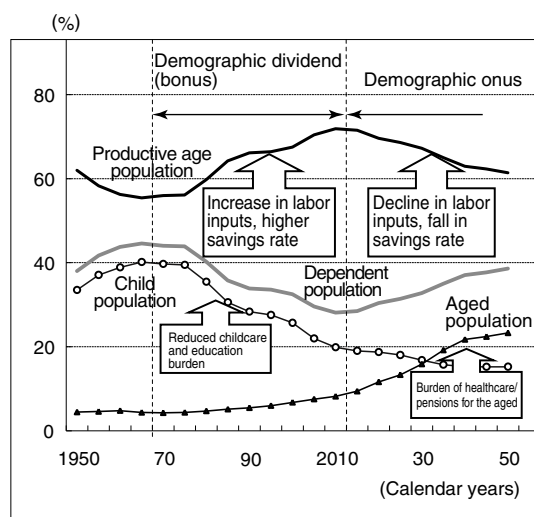
**Fig. 6 China's Dependent Population Ratio**



Notes: The high variant, medium variant and low variant center on total fertility rates of 2.35, 1.85 and 1.35 respectively.

Source: United Nations, *World Population Prospects: The 2008 Revision*

**Fig. 7 The Demographic Dividend in China**



Source: Compiled by JRI

crease as the demographic aging ratio rises. In contrast with the demographic dividend, or demographic bonus, this phase is sometimes referred to as the “demographic onus”<sup>(5)</sup> (Komine, T., Japan Center for Economic Research, ed. [2007]).

One of the benefits of an increased productive age population ratio is the expansion of production capacity. While the productive age population ratio is rising, the working population and labor inputs can be expected to expand. If the working population is provided with an appropriate employment environment, domestic savings rates can be expected to rise in step with this ratio. Reductions in the burden of caring for and educating the child population are also likely to contribute to higher domestic savings rates. In other words, a downward trend in the fertility rate offers opportunities to provide the increased labor inputs needed for economic growth, and to secure the savings needed to develop capital stocks.

The word “opportunities” was used here because increases in the productive age population ratio do not necessarily lead to economic growth, since there can be no increase in the working population or upward pressure on savings rates unless the labor market has the capacity to absorb an expanded productive age population. And unless do-

mestic financial systems are properly developed, higher savings rates will not result in the accumulation of capital stocks, which helps to accelerate economic growth. This is what we mean by “demographic dividend.”

As demographic aging proceeds, the benefits of increased production capacity resulting from the demographic dividend are eroded, and a mechanism that is the exact opposite of this effect begins to operate. This is because reduced labor inputs and lower saving rates push down growth.

## (2) The Duration of the Demographic Dividend

There is a limited period in which an economy can benefit from the demographic dividend. Given the likelihood that the burden associated with demographic aging will subsequently start to increase, the question of how long the dividend will continue becomes a focus of concern. There is no generally accepted view concerning the duration of the demographic dividend. As shown in Fig. 7, however, many believe that the period comes to end when the productive age population ratio shifts from growth to decline (or when the dependent population ratio shifts from decline to growth).

In Table 1, we have used United Nations population prospects to calculate the end point for the demographic dividend in various Asian economies. The period has already ended in Japan. The NIEs, including South Korea and Taiwan, and also China and Thailand will reach this point between 2010 and 2015. Other economies can be expected to enjoy a demographic dividend for longer than this, though the duration will not be substantially greater.

The per capita GDP levels shown on the far right of Table 1 show that in all of the economies except Japan and the NIEs, the benefits of the demographic dividend are lost and the transition to the aged society stage will occur before income levels rise. In China, this transition to aging before wealth is achieved has become the focus of debate. In Thailand, too, measures to maintain growth in an aging society are key elements in the



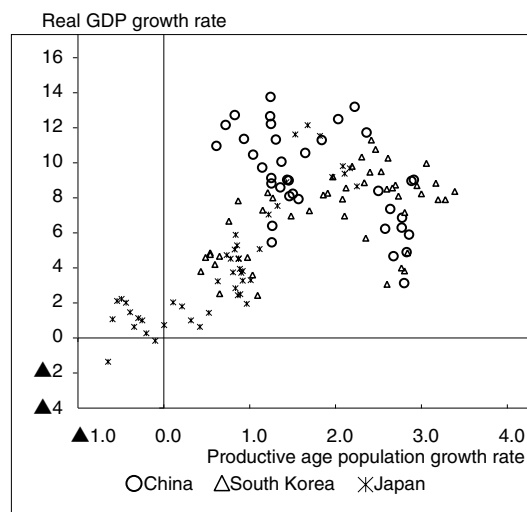
**Table 1 The Duration of the Demographic Dividend**

	Demographic Dividend Period (Years)		Per capita GDP 2009 (\$)
	Start	End	
Japan	1930 – 35	1990 – 95	39,727
NIEs			
South Korea	1965 – 70	2010 – 15	17,078
Taiwan	1960 – 65	2010 – 15	16,380
Hong Kong	1960 – 65	2010 – 15	30,065
Singapore	1960 – 65	2010 – 15	36,537
China	1965 – 70	2010 – 15	3,734
ASEAN 5			
Thailand	1965 – 70	2010 – 15	3,946
Malaysia	1965 – 70	2030 – 35	6,812
Indonesia	1970 – 75	2020 – 25	2,335
Philippines	1960 – 65	2040 – 45	1,746
Vietnam	1970 – 75	2015 – 20	1,130
India	1965 – 70	2035 – 40	1,100

Notes: Medium variants

Source: Compiled using United Nations, *World Population Prospects: The 2008 Revision*, IMF Statistics, Statistical Bureau of Taiwan

**Fig. 8 Growth Rates of Real GDP and Productive Age Populations**



Notes: Real GDP growth rates are based on three-year moving averages.

Source: United Nations, *World Population Prospects, The 2008 Revision World Development Indicators*

12th National Economic and Social Development Plan (2011-2015).

Of course, a downward shift in the productive age population ratio does not trigger a rapid drop in the economic growth rate. While the reduction of labor inputs resulting from a decline in the productive age population ratio will impede growth, as long as the ratio remains high, saving rates can also be expected to remain high. If savings are used effectively and efficiently, it may be possible to maintain a high economic growth rate<sup>(6)</sup>.

Fig. 8 analyzes trends in the productive age population growth rates and real GDP growth rates of Japan, South Korea and China, using three-year moving averages. The figures show that in both Japan and South Korea there is a strong positive correlation between the productive age population growth rate and the real GDP growth rate. This means that the real GDP growth rate tends to decline when the growth rate of the productive age population slows.

In fact, there is debate in Japan about how sustainable growth can be maintained by an economy affected by low fertility, demographic aging and population decline. South Korea is still in the middle of its demographic dividend phase, but the growth rate of its productive age population has

slowed from 2% in the first half of the 1990s to below 1% in 2000-2005, while its average yearly growth rate has slowed from 6.5% in 1990-2000 to 3.9% in 2000-09.

In contrast, China's GDP growth rate shows no signs of slowing, despite the fact that the growth rate of its productive age population has been below 1% since the start of the new millennium. Its average growth rate has remained high at 10.4% in 1990-2000 and 10.5% in 2000-2009, indicating that there may even be a negative correlation. China is expected to reach the end of its demographic dividend phase at the same time as South Korea, yet there is no evidence that its economic growth is decelerating.

How should this situation be explained?

### (3) The Demographic Dividend with Full Employment and with Underemployment

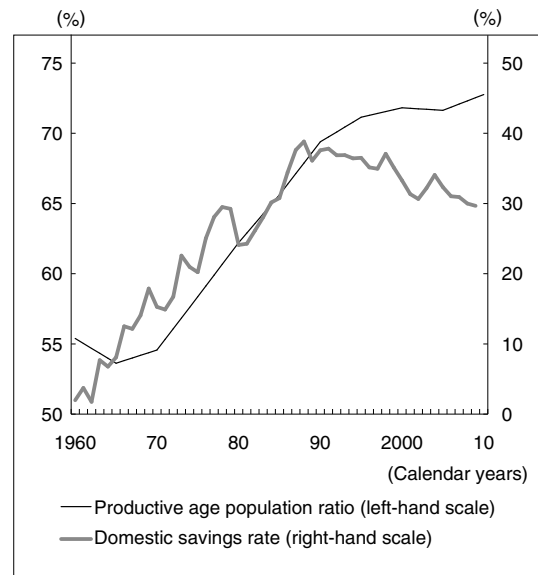
When analyzing the benefits of the demographic dividend for China, we need to be aware that the demographic dividend theory assumes that changes in the productive age population and the labor population will be the same. The demographic dividend model is premised on a full em-

ployment situation and is therefore applicable to Japan and South Korea. Some modification will be needed, however, if there is an underemployment situation in inland and rural areas of China. The following analysis identifies characteristics of the demographic dividend in China, where there is an underemployment situation, through comparisons with South Korea.

One of the benefits of the demographic dividend is expansion of labor inputs resulting from the growth of the productive age population. Particularly significant is the potential for dramatic growth in the labor population when a baby boom generation enters the labor market. Developing countries are likely to have demographic structures that are suitable for the growth of labor-intensive industries. When South Korea's baby boom generation entered the labor market in the second half of the 1960s, its government switched from an industrialization policy based on import replacement to one of export-oriented industrialization based on the mobilization of vast labor resources to expand production of labor-intensive goods. This process absorbed labor from the baby boom generation and resulted in a rapid shift from agriculture to manufacturing as the core of South Korean industry. Between 1965 and 1980, exports increased dramatically from \$800 million to \$18,100 million, mainly because of the contribution from labor-intensive manufactured goods. This rapid growth became known as the "Hangang Miracle."

The growth rate of China's productive age population began to rise around 1965-70. However, China was intent on the development of heavy industries under its planned economic system, and little thought was given to the development of labor-intensive industries. In addition, migration within China was restricted under the household register system, with the result that it was difficult to utilize labor from other regions in urban areas. This type of mismatching, which continued for some time even after the shift to the reform and open-door policy, was one of the factors that bottled up surplus labor, especially the young working population that included the first baby boom generation, in inland and rural areas.

**Fig. 9 Productive Age Population Ratio and Domestic Savings Rate (South Korea)**



Source: United Nations, *World Population Prospects*, *World Development Indicators*

South Korea achieved full employment through the development of labor-intensive industries. It is regarded as having passed through the Lewisian turning point, at which an economy shifts from a labor surplus to a labor shortage, in the 1970s. Having achieved full employment, South Korea subsequently experienced a rise in its domestic savings rate, which climbed from 8.1% in 1962 to 20.2% in 1975 and 30.8% in 1985 (Fig. 9). These funds were used to launch the development of capital-intensive industries. South Korea's heavy and chemical industries began to grow dramatically in the 1970s, and in 1980s brought growth in the exports of goods manufactured by these industries.

China's employment environment has improved significantly since the mid-1990s, especially in coastal and urban areas. Companies from many parts of the world began to move into China in search of low-cost labor, as a result of the establishment and expansion of special economic zones in coastal and urban areas, as well as Deng Xiaoping's pledge to the international community in his "speeches during a visit to the south" that China would maintain its open-door policy. This situa-

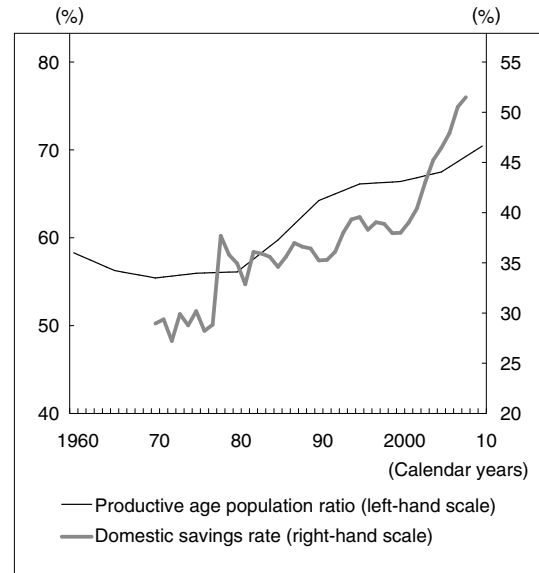
tion led to labor shortages in the coastal and urban areas that had become China's export centers, and these areas began to accept labor from inland and rural areas. This provided an opportunity to absorb surplus labor. China's domestic savings rate, which had traditionally been high, has risen even higher since migration to coastal and urban areas began in earnest after 2000. By 2009 it had reached 51.2% (Fig. 10).

As a result of migration, China is moving from underemployment to full employment. The utilization of surplus labor has clearly allowed labor inputs to increase beyond the levels that would be expected based on changes in the productive age population. That is one of the factors that has enabled China to maintain high economic growth in recent years despite the decelerating growth rate of its productive age population. Furthermore, the duration of the demographic dividend period, as estimated based on population dynamics, can be extended as long as the economy continues to absorb surplus labor.

Obviously, the supply of surplus labor is not unlimited. Eventually the supply will inevitably be exhausted, allowing the gap between the productive age population and the labor population to narrow and leading to a full employment situation. That will be the end point for the demographic dividend in China.

For this reason, we need to take future trends in surplus labor resources in inland and rural areas into account when attempting to predict the outlook for the Chinese economy. In 2009, China's urbanization ratio (the percentage of the population living in cities) was 46.6%, while the agricultural sector accounted for 38.1% of the employed population. These figures indicate that there are still substantial resources of surplus labor in inland and rural areas. However, upward movement in urban wages suggests that China cannot be too far from the Lewisian turning point, when labor surpluses will give way to labor shortages.

**Fig. 10 Productive Age Population Ratio and Domestic Savings Rate (China)**



Source: United Nations, *World Population Prospects*, *World Development Indicators*

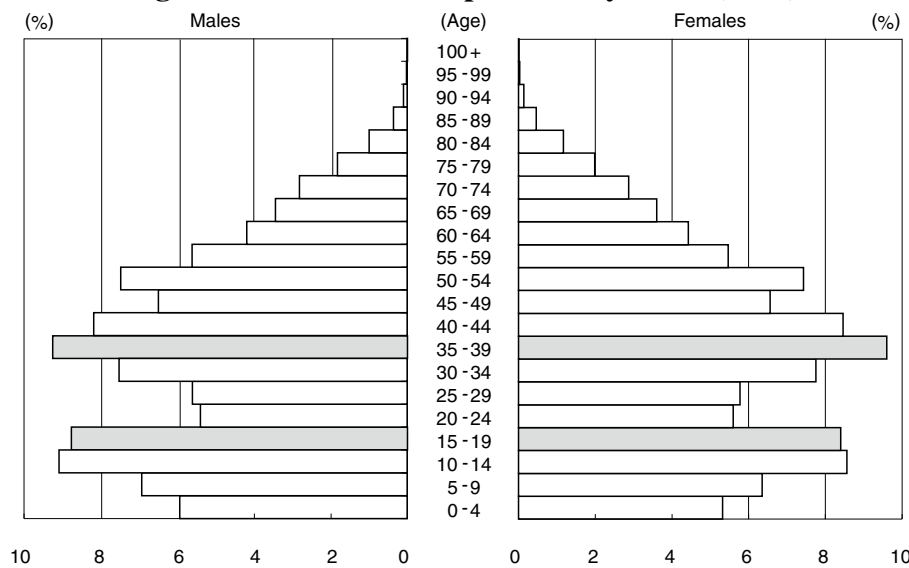
### 3. Issues Surrounding the Demographic Dividend

#### (1) The Capacity of the Baby Boom Generation to Relocate and Change Jobs

While some surplus labor is likely to exist in cities, we can assume that the vast majority is located in rural areas. In this section, we will consider the sustainability of China's economic growth from the perspective of the rural population pyramid. More significant than the quantity of surplus labor are qualitative changes. For surplus labor in rural areas to contribute to economic growth, they will need the capacity to change occupations by moving into the manufacturing sector (occupational transition), and the capacity to relocate to urban areas (regional relocation). However, not all people possess these qualities to the same extent, and capacity tends to attenuate with age.

Features of the 2005 population pyramid of the rural sector, as shown in Fig. 11, include (1) the existence of the first baby boom generation in

**Fig. 11 China's Rural Population Pyramid (2005)**



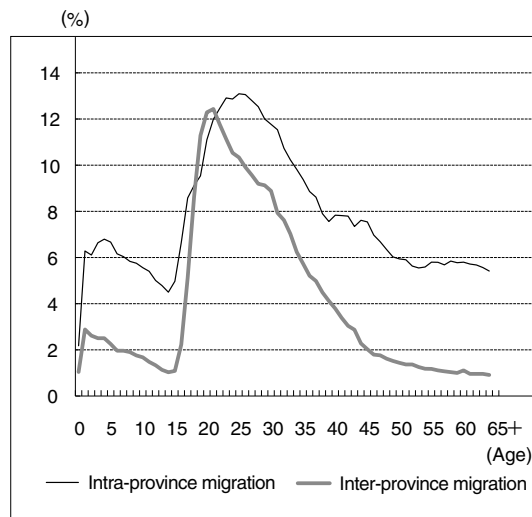
Notes: The figures are based on a 1 percent survey.  
Source: Data from the 2005 national one percent sampling census

the 25-39 age group (40-44 in 2010), (2) the low number of children, reflecting a low rural fertility rate, (3) the existence of the second boom generation in the 15-19 age group (20-24 in 2010), and (4) the small percentage of the population in the age groups between the two baby boom generations.

The low percentage of the population in the age groups sandwiched between the two baby boom generations is attributable both to a low rural fertility rate, and also to the migration of rural people in these age groups to urban areas. Fig. 12 is an analysis of migration by age groups (known as the “migration schedule”). The peak in the 20-24 age group matches the patterns in the rural population pyramid. It also confirms the role of migration as a source of growth in urban labor inputs.

This means that the second baby boom generation can be expected to support economic growth by migrating to coastal and urban areas as a source of labor for the manufacturing and service sectors. Of particular significance is the extremely small size of the younger age groups below the second baby boom generation in the population pyramid. This means that the number of young workers in the rural sector will begin to shrink rapidly in 5-10 years, reducing the supply of labor

**Fig. 12 China's Migration Schedule**



Source: Data from the 2005 national one percent sampling census

to urban areas, and to the manufacturing and service sectors.

Of course, surplus labor in the rural sector is not limited to the younger age groups, and in fact the first baby boom generation is thought to include a higher number of surplus workers. However, while there are substantial surplus labor resources in the first baby boom generation, it is apparent

from the migration schedule that their capacity to relocate to cities is waning, since long-distance migration between provinces would be especially difficult for people in this age group. As shown in Fig. 12, the inter-province migration ratio has fallen by smaller margin than the intra-province migration ratio, indicating that a decline in the number of surplus workers able to undertake long-distance migration from inland regions may be one of the causes of the labor shortages that have occurred in coastal areas in recent years.

Also significant is the fact that people in the first baby boom generation are losing their capacity to move into different industries. Most of these people are currently employed in agriculture, and it would probably be difficult for them to change to other occupations. Table 2 shows the highest educational levels of rural people in 2005. There is a clear contrast between the two baby boom generations, which are highlighted in the table by shading. In part because of the government's emphasis on education, approximately 35% of people in the second baby boom generation have been educated to senior high school level or higher, while over 95% of those in the first baby boom generation finished their education at the junior high school level or lower.

The capacity to move between industries depends not only on educational levels, but also on other factors, such as past experience, knowledge, personal networks and individual effort. What is clear, however, is that as people in the first baby boom generation age, it will become more difficult for them to change occupations. In short, we need to be aware that while there is surplus labor in rural areas, it is gradually losing its capacity to become a source of labor for urban areas and the manufacturing and service sectors.

## (2) How Long Can China Continue to Absorb Surplus Labor?

Given the situation in the rural sector, we should assume that the remaining supply of surplus labor available for use in coastal and urban areas is not especially large. Cai Fang, Director of the Institute of Population and Labor Econom-

**Table 2 Highest Educational Levels in Rural China**

(%)

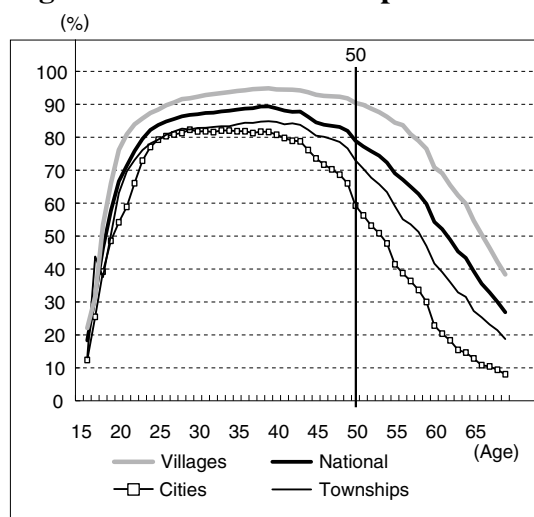
Age	No school education	Elementary school	Junior high school	Senior high school	College/university	Total
6-9	5.5	94.1	0.4	0.0	0.0	100.0
10-14	0.9	60.8	37.9	0.4	0.0	100.0
15-19	1.3	9.7	65.6	22.3	1.0	100.0
20-24	2.9	17.0	65.7	11.3	3.1	100.0
25-29	3.9	24.0	62.4	7.5	2.2	100.0
30-34	4.9	32.2	57.0	4.8	1.1	100.0
35-39	5.6	36.7	52.8	4.2	0.7	100.0
40-44	6.8	34.2	49.5	8.9	0.6	100.0
45-49	12.2	42.2	34.9	10.1	0.6	100.0
50-54	18.1	52.3	24.4	4.7	0.4	100.0
55-59	23.1	56.7	17.4	2.4	0.4	100.0
60-64	32.9	49.6	14.8	2.4	0.3	100.0
65+	58.9	34.6	5.1	1.1	0.2	100.0
Total	13.8	40.7	38.5	6.3	0.8	100.0

Source: Data from the 2005 national one percent sampling census

ics of the Chinese Academy of Social Sciences, asserts that there is no longer any surplus labor in rural areas because of the migration that has occurred in recent years, and that China has already shifted from a labor surplus to a labor shortage (Wakabayashi, K. [2010], Kwan C. H. [2009]). Many surveys have been carried out to ascertain the level of surplus labor in the rural sector. As noted in the previous section, however, the capacity of the first baby boom generation in rural areas to change industries or migrate to other regions is waning. This means that although there is substantial surplus labor in inland and rural areas, it may not be possible to utilize that labor in coastal and urban areas, and that this could cause a transition to labor shortages. Cai Fang points out that there are over 500 million middle-aged and older people in the 40-plus age group, and it would be difficult for these people to become migrant workers. This view accords with the conclusions reached in this article. Of course, the labor shortage could be eased and the demographic dividend period extended if the government implements measures to enhance the capacity of rural people in the first baby boom generation to change industries and migrate between regions.

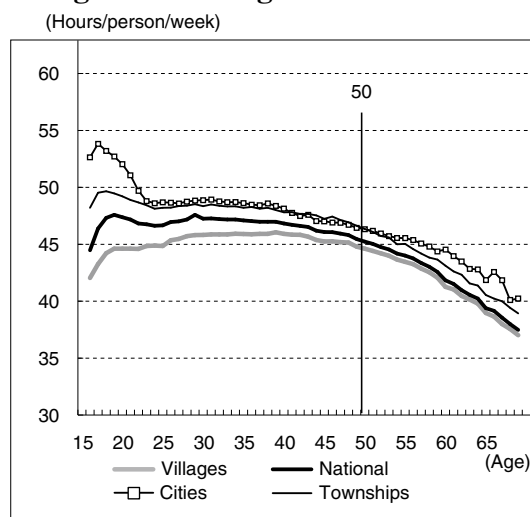
This applies to the first baby boom generation in cities as well as in the rural sector, since the

**Fig. 13 Work Force Participation Rate**



Notes: Work force participation rate = employed population/total population  
 Source: Data from the 2005 national one percent sampling census

**Fig. 14 Working Hours Per Week**



Source: Data from the 2005 national one percent sampling census

leading edge of the first baby boom generation is approaching the age of 50, when labor participation rates and labor input hours in urban areas begin to fall rapidly (Fig. 13, Fig. 14). The withdrawal of the first baby boom generation from the labor market because of advancing years would shorten the demographic dividend period. When considering China's potential for sustainable economic growth, we therefore need to take trends in the first baby boom generation into account.

The productive age population is defined as consisting of people aged between 15 and 64. However, if they are being forced to withdraw early from the labor market as they grow older, the upper limit of 64 should perhaps be lowered. Furthermore, if social expenditure is required to support people in this generation, they should be included in the aged population, rather than the productive age population. This means that improvement of the productivity of the first baby boom generation in both urban and rural areas, and the provision of employment for these people will have a vital significance for China's efforts to take full advantage of the demographic dividend and continue to achieve sustainable economic development. What needs to be emphasized here is that unless China implements such policies soon, it faces not only the rapid loss of the benefits of

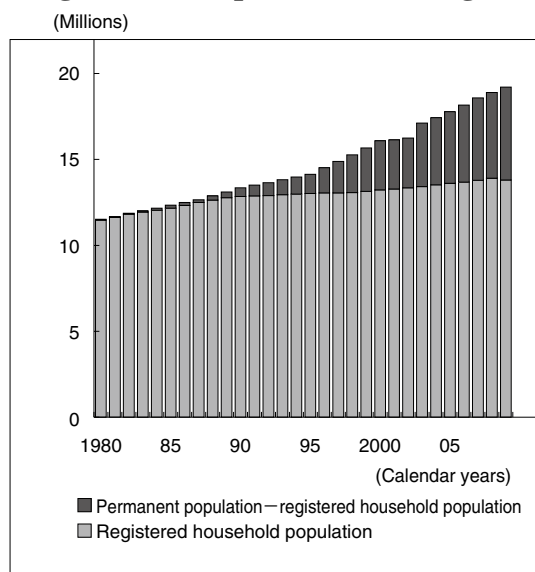
the demographic dividend, but also an increase in the demographic onus in the form of the cost of supporting the first baby boom generation.

#### 4. The Demographic Dividend and Regional Economic Disparity

In this final section we will discuss regional economic disparity from the perspective of the demographic dividend. This is because coastal and urban areas are likely to continue to enjoy demographic dividend gains even after China as a whole enters the demographic onus phase.

As stated earlier in this article, the utilization of surplus labor can have a major influence on the duration of the demographic dividend period in a country with an underemployment situation, as is the case in China. Furthermore, surplus labor has been utilized to the greatest extent in coastal and urban areas, which have been recipients of migration. Without migration, it is likely that the demographic dividend would have been obliterated in regions affected by extreme declines in fertility, such as Shanghai, and that growth would have been impeded by costs relating to demographic aging. Shanghai's registered population has remained almost static since the 1980s, while its aging ratio was over 15% in 2009 (Fig. 15).

**Fig. 15 The Population of Shanghai**



Source: *Shanghai Statistical Yearbook 2010*

Large inflows of young labor have prevented demographic aging from impeding economic growth and allowed Shanghai to maintain high growth. For example, if we assume that the difference between the permanent population and registered household population of Shanghai is equivalent to inward migration, the number of people migrating into Shanghai has risen dramatically from 1.2 million in 1995 to 2.9 million in 2000 and 5.4 million in 2009 (Fig. 15). In 2009, the migrant population accounted for 28.2% of Shanghai's total population. This figure does not include *nong-min-gong* (peasant workers), so the real migrant population may be even higher<sup>(7)</sup>.

Shanghai's high growth also appears to have been supported by its own substantial human capital, and by its ability to enhance the productivity of its human capital by drawing in large resources of human capital from inland and rural areas. Another advantage for Shanghai is its capacity, as an international city, to attract quality human resources from overseas. Other coastal and urban areas, such as Guangzhou and Beijing, enjoy similar advantages. Given these factors, it seems certain that coastal and urban areas, including Shanghai, will continue to achieve economic development even when China as a whole has entered the de-

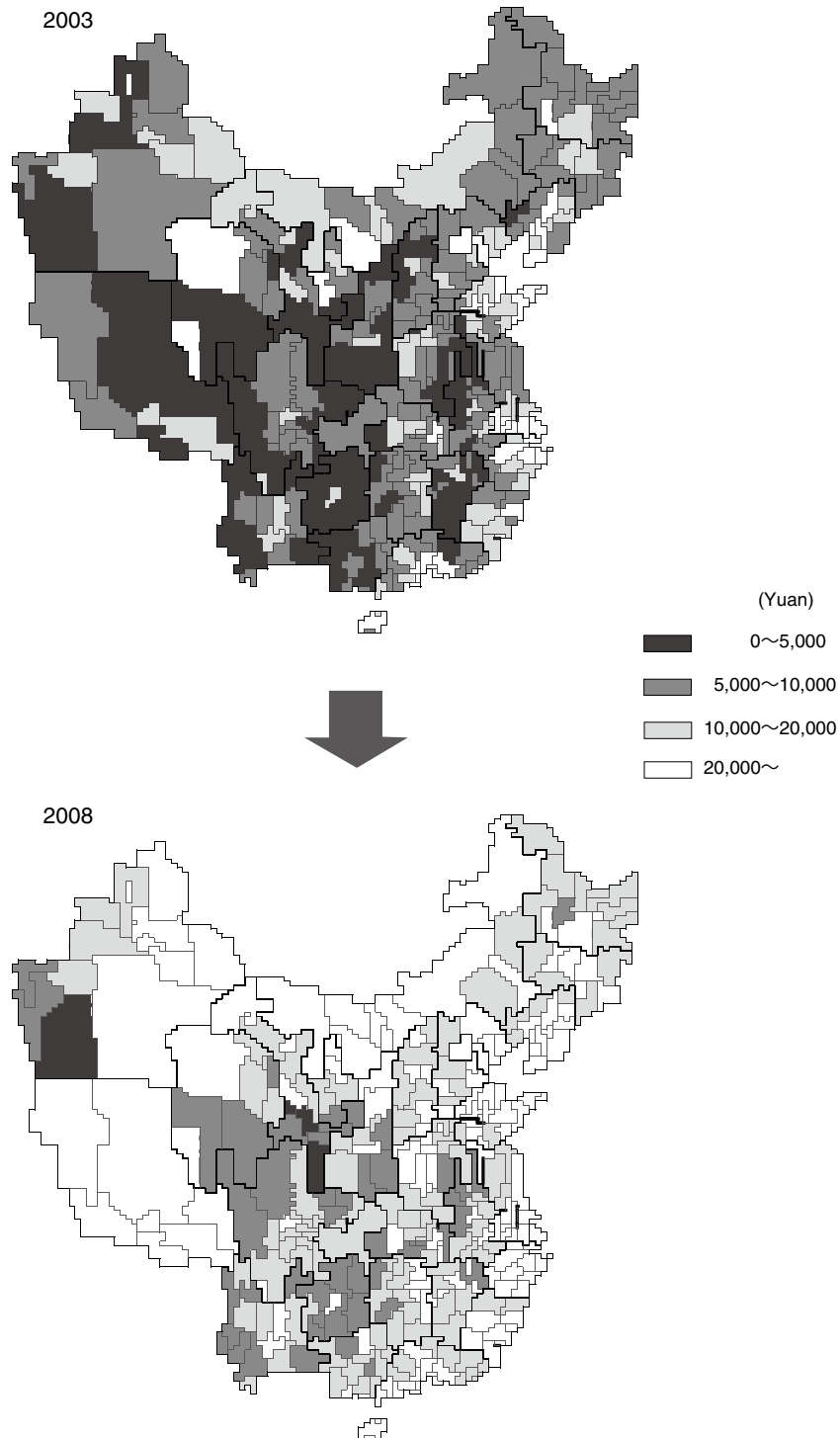
mographic onus phase.

In contrast, inland and rural areas affected by population outflows could face slower economic growth as their demographic dividend gains are transferred to urban areas. The productive age population ratios of inland and rural areas are still rising at present, and they are achieving comparatively higher growth rates through the utilization of surplus labor. The number of people whose daily consumption expenditure is below two dollars has been halved from 447 million in 1999 to 208 million in 2005 (World Bank [2010]). Regional data show that 57 of the 337 prefecture-level cities had per capita GDP below 10,000 yuan in 2008, compared with 216 in 2003 (Fig. 16).

However, this does not mean that regional economic disparity is shrinking. The population-weighted Gini coefficients for per capita GDP in the 333 prefecture-level cities and four directly-controlled municipalities has risen only marginally, from 0.40 in 2003 to 0.42 in 2008.

Furthermore, as discussed in the previous section, labor inputs will decline when the first baby boom generation begins to withdraw from the labor market as they move into their fifties. Growth will also be impeded by the falling productivity of this group. If the second baby boom generation migrates to coastal and urban areas, demographic aging in inland and rural areas will accelerate still further. The aging ratio for Chao Hu City (registered household population: 4.7 million) in Anhui Province, which has supplied large numbers of migrants to Shanghai and Jiangsu Province, is already above 14%. At 11,600 yuan, its per capita GDP is less than one-half of the national average of 25,708 yuan. Because of the high level of outward migration, the demographic dividend period is approaching its end point in regions such as this. The importance of demographic dividend disparities resulting from these regional differences in demographic composition should not be underestimated. The Chinese government is alarmed by the prospect that China will be affected by demographic aging before it has achieved wealth. This is already happening in regions such as this, and the number of regions in this situation will inevitably increase. If migration continues, it will

**Fig. 16 Per Capita GDP by Region**





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become increasingly difficult to correct regional economic disparity<sup>(8)</sup>.

Recently, there have been signs of growth in inland and rural areas, as well as in coastal and urban areas. Because the level of growth is high, low-income markets such as BOP markets have started to attract interest. However, we need to be fully aware of the implications of demographic trends (low fertility, demographic aging, migration) in these regions for sustainability.

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## End Notes

1. Prefecture-level cities are administrative units positioned immediately below provinces. See Oizumi, K. [2010a] for an economic analysis from the perspective of prefecture-level cities.
2. A society with an aging ratio over 7% is classed as an “aging society,” and one with a ratio over 14% as an “aged society.”
3. The July 24, 2009 edition of China Daily reported that the municipal government of Shanghai had decided to allow married couples who don’t have any brothers or sisters to have a second child, as a way of countering labor shortages and the increasing social welfare expenditure resulting from demographic aging.
4. United Nations population statistics use uniform fertility rates for each country. Since China’s total fertility rate is currently 1.6, it is actually positioned midway between the medium and low variants.
5. The word “onus” is used here to indicate negative effects against “bonus”.
6. For this reason, some economists refer to the benefits provided by increased labor inputs as the first demographic dividend, and gains from increased domestic savings rates as the second demographic dividend (Feng and Mason [2005]). There is no generally accepted view about the timing of the second demographic dividend, but if we assume that it occurs when the productive age population ratio is more than double the dependent population, then it is likely to occur 10-15 years later than the demographic dividend periods indicated in Table 1.
7. See Yan, S. [2010] for a discussion of Shanghai’s migrant population.
8. Chengdu City in Sichuan Province has announced a policy of integrating rural and non-rural (urban) household registers by 2012 (*Nihon Keizai Shinbun*, November 18, 2010).

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