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Population Aging and Economic Growth in China

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Executive Summary

According to current UN projections, the population of the world age 60 or older will be 2 billion by 2050. With populations aging in nearly all countries, there has been widespread concern about the possible effects on economic growth and on the ability of countries to provide support for their elderly populations. In particular, because the elderly are in general less economically productive than younger people, a preponderance of old-age individuals would seem to suggest that (a) economic growth will be slower than in the past, and (b) relatively smaller working-age cohorts of the future will be burdened by the need to care for, and pay for the support of, the elderly population.

These concerns have found resonance in China, where more than 30% of the population is expected to be age 60 or older in 2050. In part as a consequence of China's process of population aging to date, the ratio of individuals age 15-64 to those younger and older, which grew rapidly during the last few economic boom decades, has reached its peak and is slated to decline rapidly in coming decades. Because a labor force that is large in size relative to the dependent population is plausibly crucial to rapid economic growth, the decline of this ratio could conceivably herald economic difficulties.

The roots of population aging in China are the same as elsewhere: a low fertility rate, rising life expectancy, and the cumulative effect of past changes in birth and death rates. In China, obviously, the decline in the fertility rate, brought about in significant measure by the one-child policy and government efforts leading up to its adoption, has been a central factor in the changing age structure of the Chinese population. Greater longevity has also obviously been a key factor in population aging.

If an older population is in fact cause for concern about the future of the Chinese economy, it would be prudent to identify, as soon as possible, measures that could serve to counteract any negative economic effects of population aging.

Numerous countries have identified policies that might mitigate the potential economic problems associated with population aging. These policies seek to raise the age of retirement, spur higher savings, facilitate work for those caring for children, increase the labor force participation of women, liberalize immigration, and give more incentives for education.

China could indeed begin to change the legal age of retirement, for those to whom this applies. It is unlikely to seek a higher savings rate, since its savings are already very high, and there is

reason to think that increasing domestic consumption, rather than savings, will be a necessary policy measure in the coming years. However, China could attempt to redirect some of the household, societal, and private sector savings toward secure instruments to fund future retirements.

Although education receives strong emphasis in Chinese families, and educational attainment, particularly in the cities, has risen rapidly, there are still large swaths of the population where even secondary education is not guaranteed and technical training is unusual. Improving the education and skill levels of Chinese workers could make the economy more productive and more able to compensate for the impending decline in the share of working-age people. In the short run, increasing the skills that the labor force brings to the production of goods and services is a central means for further raising productivity, which is the key factor underlying rising incomes. Strengthening education is the primary means of improving such skills.

In the long run, the most promising avenue for China to avoid the possible consequences of population aging is to mobilize the portion of its potential workforce that is dormant or poorly utilized. Consideration of the possibility of adding to China's workforce when many millions are already unemployed or underemployed may be counterintuitive, but it is this very reserve labor force that can lay to rest concerns that China will not have enough workers in the future to preserve the country's impressive growth in GDP and in GDP per capita. In the cities, a higher proportion of women were employed in the past than now, and many women would like to work who cannot presently find jobs. Many people in cities are looking for work and will be available to fill most potential labor shortages as soon as they loom. In addition, the hundreds of millions of agricultural workers are not nearly as productive as those working in industry and services. China has benefited enormously by a large shift of workers out of agriculture, but there is scope for increasing this shift if the mechanization of agriculture is increased or if controls on internal migration are reduced.

In an economy full of increasingly well-off consumers and that benefits from extraordinary demand for its exports, the forces of supply and demand will tend to raise wages in sectors where labor is in greater demand. Such increases will tend to draw more people into the workforce. In addition, the mix of goods and services that are produced will be affected by supply and demand. If hundreds of millions of elderly need something, the economy will produce it, unless it is restrained from doing so. Since the evolution of needs will not be sudden, there is every reason to believe that needs will be satisfied. The specter of shortages, whether of labor, goods, or services, has little basis.

As the population ages, it will of course be necessary to devote more resources to the care and health of the elderly. And as China proceeds in its epidemiological transition toward an even greater preponderance of noncommunicable diseases, it will benefit by adopting programs that aim to diminish behaviors that lead to debilitating chronic conditions.

Pension coverage is another arena in which governmental action may benefit the elderly. Rural areas are particularly bereft of this key element of social protection. China will face numerous choices in how to construct a financially viable pension system, and it will benefit from studying the experiences of other countries. At present, and for the foreseeable future, China, like many

of its neighbors, benefits from a very strong system of family responsibility through which the elderly can count on extensive support.

Population policies are also important. An easing of the one-child policy would allow for a gradual increase in the relative size of the working-age population, as compared with the elderly population. In addition, such easing might be effective in helping to reverse the extremely highly skewed ratio of males to females in the Chinese population – a circumstance that is based on selective prenatal abortions and the neglect or worse of girl babies, and that prevents millions of men from marrying and leaves them without the support of spouse or grown children or grandchildren in their old age.

Current government efforts to spur economic development in the non-coastal provinces may also be important in avoiding any economic problems stemming from population aging. If the working population of the interior provinces is mobilized to be more productive, the Chinese economy as a whole will benefit, and regional economies will be better situated to provide care to the elderly.

China's economic growth rate is expected to gradually slow down in the future, in comparison to the breakneck pace of economic development from 1978 to today. But population aging will not be the only, or even the major, cause. One of the most important reasons for this expectation is that nearly all countries, as they develop, experience a significant slowing in economic growth; other things equal, rapid growth is typically fastest at lower levels of income. China has made considerable gains, and its economic growth is likely to moderate as the country moves toward a higher level of income.

The bottom line is that population aging is unlikely to cause significant economic problems for China. Its highly productive economy is awash with skilled workers and with those seeking to join the labor force. There is little prospect of a lack of workers leading to a marked slowing of growth in GDP or GDP per capita. To the extent that older workers are retiring, there are more than enough working-age people to fill their shoes and to support the daily needs of China's elderly population. Nevertheless, policy reforms – in education, health, pensions, labor policy, and internal migration – could make China's economic future all the more secure.

Population Aging and Economic Growth in China

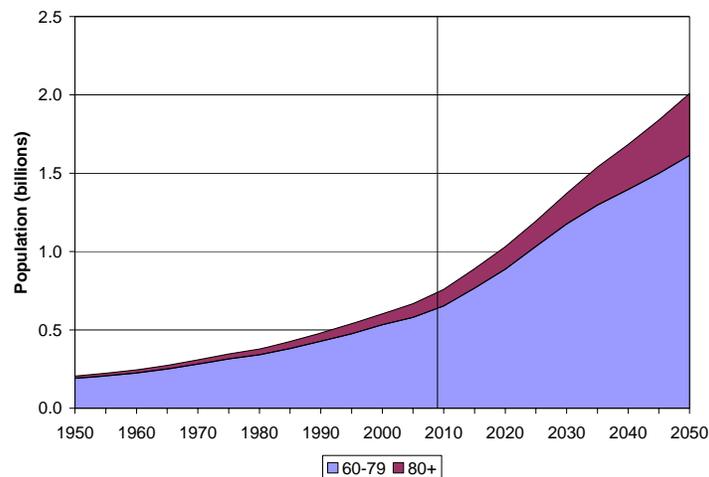
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Introduction

Population aging is taking place in most countries of the world. During the next few decades, the share of global population ages 60 and older is likely to rise to historically unprecedented levels (see Figure 1).¹ The 680 million people in this age group make up 11 percent of world population, up from 8 percent in 1950. However, according to the latest estimates, by 2050 there will be 2 billion people aged 60 and over – 22% of world population. World population is projected to be 3.6 times as large in 2050 as in 1950; the corresponding growth factors for those ages 60+ and those ages 80+ are 10 and 27 (United Nations, 2009).²

Figure 1
Projected Acceleration of World Population Aging



Source data: United Nations, 2009

This extraordinary pattern of demographic change has aroused concern in many countries for three reasons. First, the elderly population in general does not produce nearly as much as the working-age population, so the economic growth rate of economies with a high share of older people would seem likely to slow. Second, it appears that a segment of the population (the elderly) that is relatively larger than in the past will have to be supported by a relatively smaller group of economically active adults. And third, that same elderly population, because of its size, will impose a substantial burden on economies as a whole, because the elderly require more medical care than younger people.

¹ The figures in this paper cover the time frame 1950–2050. Therefore, some of the underlying data reflect past trends and others are projections. Projections involve assumptions about future fertility and mortality, around which there is considerable uncertainty that these figures do not reflect.

² United Nations, *World Population Prospects: The 2008 Revision*. 2009.

Various commentators, along with public officials, have expressed concern, and even alarm, about population aging and the economic effects that may accompany it. Perhaps the most dramatic of such statements came from Peter Peterson, the former CEO of Lehman Brothers, Secretary of Commerce, and Chairman of the New York Federal Reserve Bank, who opined that global aging is a “threat more grave and certain than those posed by chemical weapons, nuclear proliferation, or ethnic strife”.³

The OECD has published a variety of papers that offer an array of conclusions regarding the effect of population aging on economic growth. It notes⁴ that population aging is likely to bring fiscal problems to governments because there will be relatively fewer workers to make payments to the government, while there will be more retirees expecting financial support from the government. This situation has led to calls for altering work incentives so that people work until older ages, adopting family-friendly policies that encourage parents to work, and changing tax systems so that they do not penalize two-earner families. In another report⁵, the OECD concludes that “[u]nless policies change, lower growth or absolute falls in the size of the labour force can be expected.”

In the opposite direction, a Canadian government report⁶ finds that population aging opens up opportunities for economies to invest in human capital formation that may stimulate economic growth and mitigate the possible negative economic effects of an older population.

The research of Bloom, Canning, and Fink⁷ finds that a close study of population trends suggests there is little reason for alarm in most countries. Taken together, an array of factors discussed in this paper (including lower youth dependency burdens, greater female participation in the labor force, increased savings in anticipation of retirement, and the flexibility of capitalist economies to adapt to changes in labor supply and demand and to alter management and labor practices in light of changing market conditions) suggests that population aging, in most countries, is not likely to have the dire economic consequences that some have predicted.

In general, it is not yet clear whether population aging will have significant, negative economic effects, but the issue is of concern to many countries. Nearly every country in the world will see its population age considerably during the next few decades. In this paper we consider the reasons that aging may have economic consequences in many countries, and we explore the case of China to see if the factors that affect other countries apply similarly to China.

It is important to note that, independent of the potential influence of population aging on economic growth, it is extremely likely that China's economic growth rate will decrease in the coming decades. The primary reason for such a conclusion – and the reason that so many economists inside and outside China agree on it – is that China has reached middle-income

³ Peterson, P. G. (1999) "Gray dawn: The global aging crisis", *Foreign Affairs*, January/February.

⁴ http://www.oecdobserver.org/news/fullstory.php/aid/1081/Population_ageing:_Facing_the_challenge.html

⁵ <http://www.oecd.org/dataoecd/61/50/34600619.pdf>

⁶ <http://www.fin.gc.ca/wp/98-03-eng.asp>

⁷ Bloom, David E., David Canning, and Günther Fink, "Population Aging and Economic Growth", forthcoming in Spence, Michael, and Danny Leipziger (eds.), *Global Challenges and Growth*, Commission on Growth and Development.

status. In 1978, when China's economic boom began, people throughout the country were desperately poor; hunger was widespread. The government grabbed the opportunities for rapid economic growth, and the economy expanded at a rate that is beyond all precedent, in terms of both GDP and GDP per capita. As China's income level rises, it is likely to experience the same phenomenon that other rapidly growing countries have undergone – a slowing of economic growth. In addition, some other constraints could modulate the country's future economic growth, such as limits to global export markets, China's worsening environmental pollution, water shortages, the poor quality of most of China's universities, limited farmland, weaknesses in China's financial system, and rising inequality. The supercharged-growth era will come to a close at some point, but it will not in any large measure be due to population aging. In all that we discuss below about population aging, we are talking about its effects, *all things equal*.

Brief Background on China

China includes one-fifth of the world population in a geographically huge and varied country. It has had an advanced civilization for around three millennia. Its strong hierarchical patriarchal family structure has persisted for 2 ½ millennia based on Confucianism. The Chinese empire was strong and widespread in the late 17th and the 18th centuries, but dynastic decline in China's last dynasty (the Manchu or Qing Dynasty) then coincided with expansion of the European colonial powers in Asia in the 19th and early 20th centuries. Under severe military and political pressure, the dynasty was overthrown in 1911. After four decades of turmoil, Japanese invasion, World War II, and civil war, the Communist Red Army led by Mao Zedong emerged victorious and established the People's Republic of China in 1949.

The Communist government established strong central control and sealed China's borders. Government initiatives rapidly reduced the death rate, China's population began to grow rapidly, and the age structure became even younger in the 1950s and 1960s. Concerned about the difficulties of keeping the food supply growing at least as fast as the population, the government instituted a forceful family planning program in the 1970s in both urban and rural areas. The fertility level dropped in half in less than a decade, population growth was reduced to a more manageable level, and the process of the aging of China's population structure began. Now, nearly four decades later, children constitute a much smaller share of the population, comparatively smaller birth cohorts have entered the working ages, the population has a bulge in the middle and older working ages, and the elderly population is growing in absolute size and as a proportion of the population.

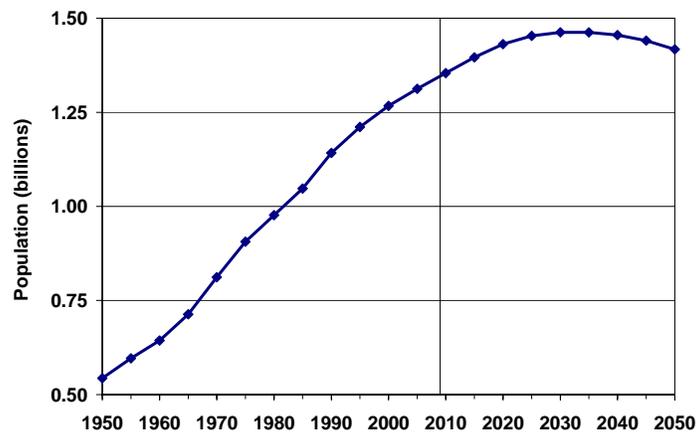
Chairman Mao Zedong died in 1976, and soon thereafter new economic reforms were instituted, reducing the role of central planning in China's economy and expanding the role of markets and private enterprise. China's economy has been one of the fastest growing economies in the world during nearly every year since 1978, for more than three decades.

China Demographic History and Projections

The United Nations Population Division assembles demographic data from all countries and makes projections about future population trends. The numbers cited here are the UN's best estimate of past and future demographic indicators. The projections are based on the UN's medium-fertility scenario.

The population of China has risen from just over 0.5 billion to 1.35 billion in the past 60 years and is projected to peak in 2030 at nearly 1.5 billion (see Figure 2). As is well known, China has seen many millions migrate to the coastal cities in recent years, so population trends vary considerably across regions.

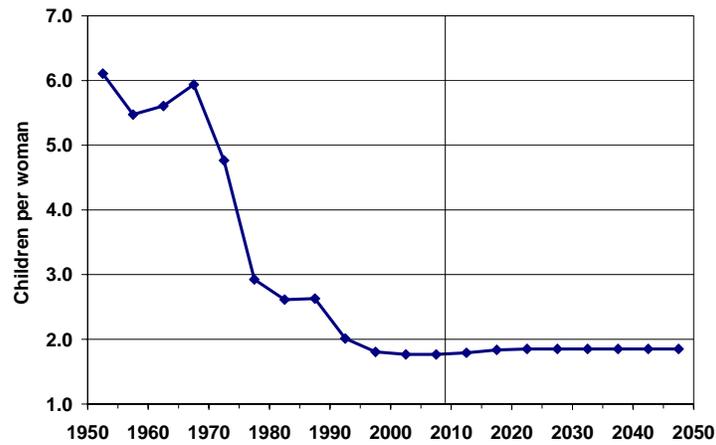
Figure 2
China's Population Size



Source: UN, 2009

China's total fertility rate fell from around 6 in 1950-1955 to 2 in 1990-1995 (see Figure 3). By 1995, the fertility rate was below 2. The decline, which was especially rapid between 1970 and 1980, began when China launched the “later, longer, fewer” campaign (later marriage and age at first birth, longer inter-birth intervals, and fewer births), which was followed by the formal introduction of the one-child policy in 1979. Indeed, a large portion of the decline took place by 1975-1980. China's population growth rate has dropped dramatically as a result. In the long run, the declining and now low fertility rate will be responsible for further slowing of China's population growth. But because of population momentum (a large population of people of childbearing age leading to a large number of births, even if the fertility rate is not very high), population growth, although slowing, will continue for another two decades. This momentum is declining as the proportion of women in childbearing years continues to decrease.

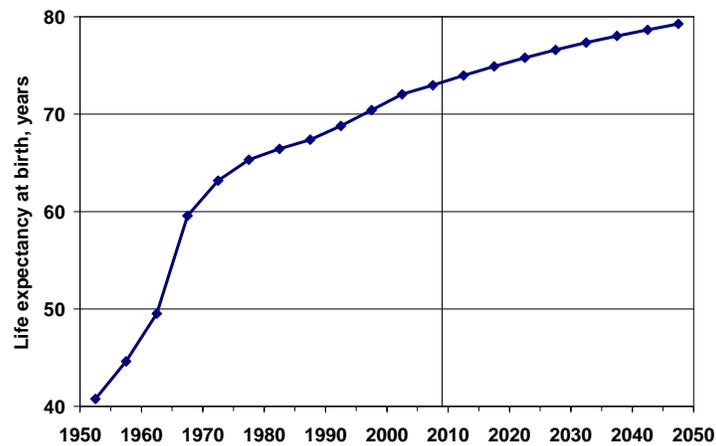
Figure 3
China's Total Fertility Rate



Source: UN, 2009

Life expectancy has been rising rapidly in China (see Figure 4). Starting at 40 years soon after mid-century, life expectancy increased precipitously in the 1950s and 1960s, has now reached approximately 73, and is expected to be nearly 80 by 2050.

Figure 4
China's Life Expectancy



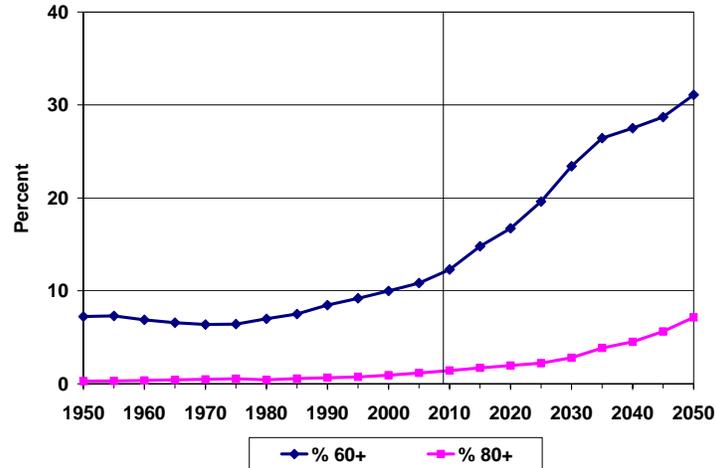
Source: UN, 2009

As a result of trends in both fertility and longevity, the elderly share of China's population has been increasing, and those ages 60 and over are set to form a rapidly growing share of the population (see Figure 5). By 2050, it is projected that the population ages 60+ and 80+ will reach 440 million and 101 million, respectively. Today, 37% of China's population ages 60+ are employed.⁸ Because most Chinese cease working before or in the years soon after they reach age 60, the demographic trend shown here has raised considerable alarm about the sources of

⁸ *China Population & Employment Statistics Yearbook 2009*, Tables 1-2, 1-10, 2-3, 3-5; pp. 4, 17, 36-38, and 161.

productive labor in China a few decades from now. If any policy or institutional adjustments are needed to allow China to respond to population aging, time is growing short.

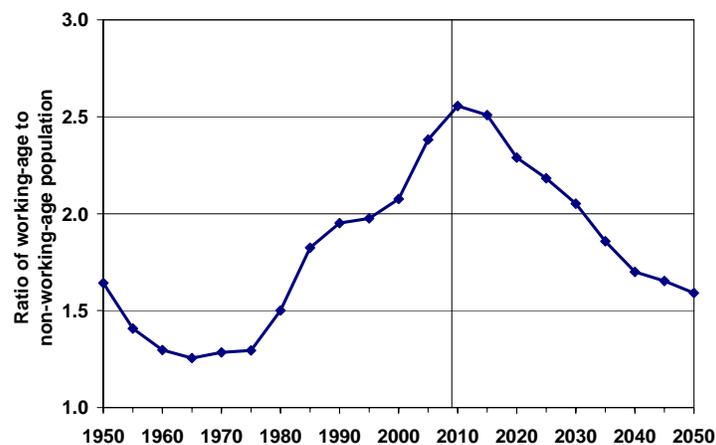
Figure 5
China Population Aging



Source: UN, 2009

Impelled by the declining fertility rate, the ratio of the working-age (15-64) to non-working-age population grew rapidly starting in the late 1970s (see Figure 6). It is reaching its peak right now and is projected to decline (in significant part because of the increasing elderly population) nearly to its 1980 level by 2050. This ratio is important because it is a direct indicator of the number of dependents each person of working-age will, on average, need to support. Persons older than 64 may well contribute in many ways, including economically, to a family and to China's overall economy, but many people have expressed concern about the future ability of China's working-age population to support the large, primarily older, dependent population.

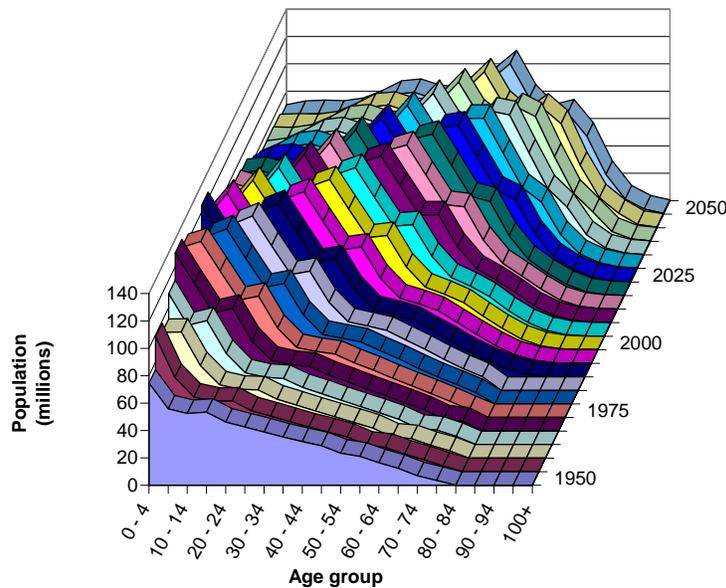
Figure 6
China's Ratio of Working-Age to Non-Working-Age Population



Source: UN, 2009

Figure 7 gives a three-dimensional view of the results of the trends discussed above, showing the population of different age groups from 1950 to 2050. Each colored slice shows the age distribution of China's population at a point in time. Given the fact that for every year that passes a person's age increases by one year, the diagonals show the aging of specific birth cohorts (net of mortality, external migration, and any differential miscounting).⁹ In 1950, the 0-4 age group had the largest population share, but the share of that group decreases over time. It is projected that the 20-24 age group and the 60-64 age group will have the largest share of population in 2010 and 2050, respectively. The graph also shows how the population in each age group changes over time. Note that the portion of each slice that shows the elderly population was much lower in previous decades than it is now. That age group, whose population in any given year is shown by the height of the corresponding slice, will be growing rapidly in coming years. The fact that the shape of the slices changes over time (such that the height of the elderly portion of the population is relatively greater in later calendar years) is another representation of the phenomenon of population aging.

Figure 7
China's Ratio of Working-Age to Non-Working-Age Population



Source: UN, 2009

In summary, population aging in China, as elsewhere, is the consequence of three factors: fertility decline (which automatically means that older members of the population make up a larger share than in the past), increasing life expectancy, and age structure dynamics. The last of these refers to the fact that large cohorts of young people (relative to the smaller generations that

⁹ We can speculate about the reasons for the decreased or increased number of 0-4 year-olds shown at specific years in this graph. The drop in 1960 may have been a consequence of the Great Leap Forward and the famine associated with it. The low numbers in 1980 and 1985 probably resulted from the implementation and enforcement of the one-child policy. The higher numbers beginning in the late 1980s resulted from a popular backlash against compulsion in family planning in the early 1980s, and may also be an echo boom from the increased number of births around 1970. In each instance, a small birth cohort forms a trough in the graph, while a large birth cohort appears as a diagonal ridge.

follow them) move through the population age structure and gradually become a relatively large older generation.

Concerns about Population Aging in China

To date, China has benefited from a rapid change in the age structure of its population. China's total fertility rate fell rapidly, beginning in the early 1970s. The resulting dearth of children meant that the generation born immediately prior to the relatively small birth cohorts of the 1970s and beyond was relatively large. When that large generation reached working age, China found itself with a very high share of working-age individuals in its population. China, along with other countries of East Asia that were in a somewhat similar situation, benefited enormously from the availability of a large labor pool and from the lessened need to spend money on the care and nurturing of children. China's economic boom from the 1970s to the present has been in part a consequence of its large working-age share. And because working-age people save more than other age groups, China's savings rate received a boost. With longevity rising, workers had an additional incentive to save for old age. And with fewer young people, families were able to invest more in the health and education of their children, which also provided a long-term economic boost.

These factors are about to change. In particular, the ratio of working-age to non-working-age individuals in China is now at its peak, and it will fall rapidly in the coming decades. At the same time, the share of the population ages 60 and above is set to rise rapidly, from about 12% now to about 31% in 2050. It is plausible that these demographic changes will slow economic growth in China. But will this be so? One thing is clear: These new demographic realities are coming into focus in China much faster than in other countries at its level of development.

In summarizing concerns about China's ability to care for its aging population, the Population Reference Bureau¹⁰ cited the rapidly increasing total cost of healthcare in China and the increase in private spending on healthcare.

In a study of the economic consequences of aging in China, Cai and Wang¹¹ find that "[u]nder the circumstance where comparative advantage is still embodied in its labor-intensive commodities, timely and sufficient supply of a skilled labor force is vital for China to sustain fast economic growth." They cite a shortage of migrant labor in the Pearl River Delta region that began in 2003 and that has spread to other areas since that time. Without sufficient labor, they explain, manufacturing wages have risen and will continue to rise, which will decrease China's export competitiveness.¹² Peng and Mai¹³ emphasize the positive side of this situation: that if

¹⁰ <http://www.prb.org/Articles/2006/ChinasConcernOverPopulationAgingandHealth.aspx>

¹¹ Cai, F., & Wang, M. (2006). Challenge Facing China's Economic Growth in Its Aging but not Affluent Era. *China & World Economy*, Vol 14, No. 5, 2006, 20-31. www.eaber.org/intranet/documents/42/1838/IWEP_Cai_2006.pdf

¹² See also Erin Lett and Judith Banister. China's Manufacturing Employment and Compensation Costs: 2002-06. *Monthly Labor Review*, April 2009, 30-38.

¹³ Peng, X., & Mai, Y. (2008). Population Ageing, Labour Market Reform and Economic Growth in China - A Dynamic General Equilibrium Analysis. ([URL: <http://www.nzae.org.nz/conferences/2008/090708/nr1215393382.pdf>])

China can overcome discrimination against rural workers who migrate to urban areas, it will be able to avoid a slowdown in its manufactured exports.

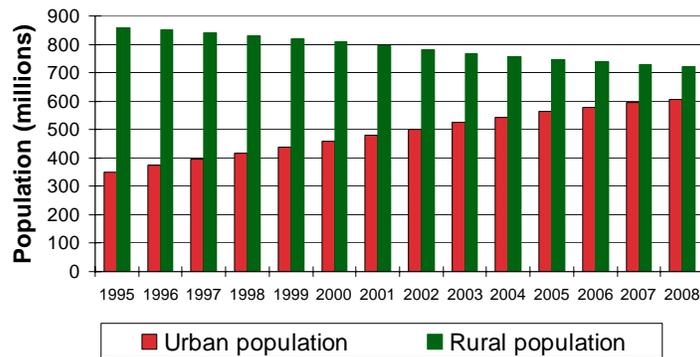
Numerous countries have identified policies that might mitigate the potential economic problems associated with population aging. These policies seek to raise the age of retirement, spur higher savings, facilitate work for those caring for children, increase the labor force participation of women, liberalize immigration, and give more incentives for education.

Below, we consider whether these policies are relevant to China and whether they would have the desired effect if implemented. A first look suggests that some of these policies would not operate in China in the same manner as elsewhere. In China, the female labor force participation rate is already high (though it has declined considerably in the cities and could perhaps increase again in the future). The savings rate is also quite high. Primary school education is very widespread, although there is considerable room for improvement in secondary school enrollment. Producing goods and services requires a workforce of adequate size, but China is the world's most populous country and it has the world's largest workforce. In the future, as China's population structure ages, China's migrant workers leaving agriculture, along with currently underemployed and unemployed workers, may well be able to provide the required workforce to support the elderly population. We stress the potential importance of China's large pool of underutilized and untapped labor in concluding that population aging is not likely to cause significant problems for China's economic growth.

Urbanization and Population Aging in China

Conditions and prospects for the elderly population are very different between urban and rural China. As recently as 1978, the country was overwhelmingly rural, with only 18 percent of the population in urban areas. During the last three decades, the government has allowed workers to migrate to towns and cities. Since 1995, urbanization has annually reduced the absolute size of the rural population while swelling urban population numbers, as shown in Figure 8. In the most recent period 2005-2008, China's urban population growth rate has averaged 2 ½ percent per year. Today the population of China is 54 percent rural and 46 percent urban, and urbanization is expected to continue. Within the urban population, life for the aged in cities is much more secure than in the towns that have been incorporated as urban places.

Figure 8
Urban and Rural Population of China, 1995-2008



Source: *China Statistical Yearbook 2009*, Table 3-1, p. 89.

China's age structure as of the end of 2008, based on published Chinese sources, is shown in Table 1. After decades of low fertility, China has an unusually low proportion of its population in childhood ages, in comparison to most developing countries. An extraordinarily high share of the population is in the working-age groups. The city, town, and rural population age structures today reflect differential fertility levels and migration patterns. In the cities, as a result of the one-child family planning policy, only 13 percent of the population is children; correspondingly high proportions of the population are in working ages and elderly ages. In addition, migrants to the cities have mostly migrated in for work, thus swelling the working-age share of the city population. The towns have higher fertility than cities, so children constitute a larger proportion of the town population. Migrants also flow out of the villages into towns, increasing the population of working-age individuals in the towns. The majority of China's population still in the villages has higher fertility than in urban China, so children are a larger proportion of the rural population. Out-migration shrinks the workforce age groups in rural China and leaves the elderly as a higher share of the population in the villages than in the towns.

Table 1
Age Structure in Urban and Rural China as Reported, Yearend 2008 (Percent)

Age Group	From Statistical	From National Population Survey			
	Communique	China	City	Town	Rural
0-14	19.0	17.3	12.9	17.1	19.4
15-59	69.0	68.7	73.3	69.8	66.1
60+	12.0	14.0	16.8	13.0	14.5
15-64		73.1	77.5	74.1	70.8
65+	8.3	9.5	12.7	8.8	9.8

Sources: China National Bureau of Statistics, *Statistical Communique of the People's Republic of China on the 2008 National Economic and Social Development*, Feb. 26, 2009, Table 15; *China Population & Employment Statistics Yearbook 2009*, Tables 2-3 to 2-6, pp. 36-47. Data from the Nov. 2008 National Sample Survey on Population Changes.

Healthy Aging and the Health of China's Elderly

As elsewhere, aging in China is not accompanied by the same patterns of physical and mental decline that formerly prevailed. The reason is that while life expectancy has increased in China, the number of years of *healthy* life expectancy has also increased. From 1987 to 1992, for example, the number of healthy years of life expectancy for a Chinese at age 65 increased by about 2 (e.g., for males, from 10 to 12). The percentage of life spent in a healthy condition also increased during the same period.¹⁴ The trend is clear. This phenomenon, known as the "compression of morbidity" means that Chinese are experiencing, or can look forward to experiencing, a longer period of life, both absolutely and as a share of total lifespan, during which they can be healthy enough to work.

In the working ages, if illness and disability can be reduced over time, this can help China cope with population aging because a healthier population is more productive. Usable data on the health and wellness or the morbidity (sickness) of the working-age population in China over time are scarce.

It may also be relevant to a discussion of the economic effects of aging that the pattern of disease is changing in China. As with most developing countries, infectious diseases long accounted for a high portion of deaths. But noncommunicable diseases, such as cardiovascular diseases and cancer, accounted for 59% of all deaths in 2004.¹⁵ Hypertension affects more than 150 million Chinese, and roughly 300 million men smoke. And the conditions underlying the development of chronic disease (such as being overweight or obese) are beginning to be widespread among children.¹⁶ As the elderly are increasingly subject to noncommunicable disease, the types of facilities and healthcare skills that are needed will change. It is unclear whether such changes will lead to greater or lesser healthcare costs. Moreover, even in light of the compression of morbidity discussed above, it is possible that the aged will have a greater number of years of ill health. That outcome is far from certain and is a source of risk regarding future health expenditure.

The massively increased number of elderly in China – along with the certainty that the share of the population that is age 60 and over will rise rapidly in coming years – has given rise to widespread concern about their health and their financial well-being. Further concern centers around the basic care and companionship that these hundreds of millions of Chinese will need – and whether families, which have traditionally provided such care – will be able to do so, or will choose to, in the future.

The most recent World Health Survey for China¹⁷ was administered in 2002. The survey was not nationally representative, but the data emerging from the sample suggest that the health of the

¹⁴ www.geri.duke.edu/china_study/Lamb%20HLE.ppt

¹⁵ WHO, World Health Statistics 2009. Table 2, page 48.

¹⁶ Preventing chronic diseases in China, *The Lancet*, Volume 366, Issue 9499, Pages 1821-1824, L. Wang, L. Kong, F. Wu, Y. Bai, R. Burton, 19 November 2005.

¹⁷ World Health Organization, *Report of China*. <http://www.who.int/healthinfo/survey/whschn-china.pdf>

elderly is better than one might expect. Unfortunately, no longitudinal data are available, so no estimate can be made of any change over time in the health of the elderly.

Overall, 37% of those aged 60-69 say their health is good or very good, and 31% of those aged 70-79 say the same. The percentages are of course higher for younger ages. Further study would be needed to compare China with other countries, in terms of the *relative* health of the elderly in relation to that of the non-elderly.

Nearly half of those aged 60-69 reported that they did not use either ambulatory or informal medical care in the year preceding the survey and did not use hospital inpatient care in the preceding three years. But the frequency of unmet need in this age group was similar to that of the rest of the population, around 1%.

It is perhaps of note that reported average daily consumption of tobacco and alcohol by the elderly is similar to that of the rest of the population.

China's Social Safety Net for the Aged

China today is a middle-income developing country. Its social safety net is improving but is not yet strong. When Mao Zedong still led China in the late 1960s and the 1970s, the country became famous as a global model for its barefoot doctors, its rural cooperative medical insurance system that covered nine-tenths of the rural population, and its public health insurance system for the urban population. But after the economic reform period began in 1978, China abandoned the rural health insurance system and much of the urban medical insurance coverage as well. Only in very recent years has China begun to reverse the near-collapse of public support for health insurance.

China now requires city employees and employers to pay monthly into municipal medical insurance pools. Official data report that by late 2008, there were a total of 200 million "persons [staff and workers] and retirees joining the urban basic medical care system;" of these, 150 million were contributors and 50 million were retirees.¹⁸ What medical costs are covered, and whether any family members are covered partly or at all, varies from city to city and town to town. The 150 million contributors were half of China's 302 million employed urban workers. Anecdotal reports suggest that the urban medical scheme is indeed basic, and many companies supplement this required coverage with additional medical benefits.

The government also reported that by late 2008 there were 117 million urban residents participating in a health insurance system outside the scheme for employees.¹⁹ The total of 317 million urban workers and residents participating in some kind of medical insurance coverage program constituted just over half of China's urban population.

¹⁸ *China Statistical Yearbook 2009*, Tables 3-1, 4-1, 9-1, 22-39, 22-41, and 22-44; pp. 89, 111, 316, 941, 942, 945.

¹⁹ China National Bureau of Statistics, Statistical Communique of the People's Republic of China on the 2008 National Economic and Social Development, radio broadcast of Feb. 26, 2009.

The government has also decided to recreate the rural cooperative medical insurance system. Since the “New Rural Cooperative Medical System” was launched in 2004, at least nominal participation has increased rapidly. By the end of 2008, almost all counties of China (95%) reported that they are participating. A total of 815 million people were said to be participating. The rural population was 721 million that year, so some town people appear to be covered also. Official data show that there were 585 million payouts from the rural cooperative medical system during 2008. The funds raised and paid out in this scheme are modest on a per capita basis; compensation for medical care averaged 81 yuan per participant in the system (or US\$ 12 at the market exchange rate) for the year 2008.²⁰

Of total expenditure on health in China, as recently as 2001, 40% was public (government budget plus social medical insurance) expenditure and 60% was out-of-pocket individual cash expenditures. The proportion shifted to 55% public and social insurance expenditures and 45% individual expenditures by 2007.²¹

In China as elsewhere, health coverage and access to preventive and curative care are important for the elderly, not only to extend their lives but also to reduce illness and improve the quality of their longer lives. The weakness of China’s health finance in recent decades has exposed families to the risk of being driven back into poverty by one serious health problem of even one family member. With an aging parent, grandparent, or other relative, the economic status of the family can become more precarious.

China has paid attention to the development of its old age pension system in the most recent decades, but only in urban areas. By the end of 2008, 166 million urban employees (55% of urban employed workers) were contributing to the urban basic pension insurance scheme, and 53 million retirees were benefiting from the system. There are many financial problems with the myriad municipal pension systems, including urban pension obligations inherited from decades of comparatively young legal retirement age, geographically limited local pension pools, different rules and coverage from place to place, misuse of pension funds, and limited coverage for most retirees. Much of the urban Chinese population, particularly in urban towns, still does not have pension coverage. Rural China barely has any pension system. There were only 8 million contributors to the basic rural pension insurance system in 2008, and 5 million people were beneficiaries that year. Chinese and foreign pension experts have proposed innovative solutions to the pension needs of China’s urban and rural elderly in the coming years and decades.²² These studies draw on the successes and failures of pension systems around the world and select what seem to be the best options for China at its current stage of development. They propose to set up a multifaceted pension system that can carry China forward as its population ages, usually including pay-as-you-go, social funding, individual accounts, and anti-poverty components.

²⁰ For data see *China Statistical Yearbook 2009*, Tables 21-46 and 21-47, pp. 908-909.

²¹ *China Statistical Yearbook 2009*, Table 21-48, p. 909.

²² *China Statistical Yearbook 2009*, Tables 22-39, 22-40, 22-42, and 22-47; pp. 941-943, 948. On proposed solutions to the old age security needs of China’s aging population, see China Economic Research and Advisory Programme, *Social Security Reform in China: Issues and Options*, 2005; http://econ.lse.ac.uk/staff/nb/barr_SocialSecurityStudy2005.pdf and Nicholas Barr and Peter Diamond, *Pension Reform in China*, draft report 2009.

Family Support and Social Support for China's Elderly

Table 2 shows the main source of support for China's older population ages 60 and above, contrasting the support system for the elderly in China's cities, towns, and rural areas. In cities, pensions are the main source of support for most of the aged, followed by family support. Few of the elderly continue to work for income in China's cities after age 60, both because they have reached legal retirement age and because there are too few jobs to allow them to continue earning (trends in employment participation rates in China's cities are discussed below). Older workers in China's cities embody less human capital than city-born young and middle-aged adults. Millions of older workers have been laid off from disappearing state-owned enterprises and collective enterprises. Young and middle-aged adults tend to get the newly created jobs, yet there is still unemployment and underemployment in all adult age groups in the cities. In the towns, almost a third of the population ages 60+ continue working and supporting themselves, while 41% rely primarily on family support, and only 21% live primarily on pensions.

Table 2
China's Urban and Rural Population Ages 60 and Older, Main Source of Support
November 2008 (Percent)

	Own labor income	Family	Pension	Welfare	Other
China	36.7	35.7	23.1	2.4	2.1
Cities	6.9	20.5	68.4	2.1	2.1
Towns	31.7	41.0	21.4	3.1	2.9
Rural	51.3	40.5	4.1	2.3	1.8

Source: *China Population & Employment Statistics Yearbook 2009*, Tables 2-52 to 2-59, pp. 130-153.

Notes: Data are from the nationally representative Nov. 2008 China Population & Labor Force Sample Survey. "Welfare" is public support called the minimum living guarantee. "Other" includes unemployment insurance payments, subsistence allowances for laid-off workers, early retirement allowances, previous savings, house rental income, and other sources of support.

In rural China, the elderly continue working for as long as they are able. For most of the aged rural population, there is no such thing as legal retirement age. They support themselves if they can. In addition, 41% of the rural elderly rely on their families for support. Only 4% have pensions.

As indicated in Table 2, China does have some anti-poverty programs, welfare systems, unemployment insurance, and subsistence allowances that provide the main source of support, generally very minimal support, to about 4-6 percent of the population ages 60+. But China's elderly depend primarily on their own work and earnings, financial support from other family members, and (particularly in the cities) pensions. Given the situation on the ground in China today, and the future aging of the population in both urban and rural China, how will China's older population be supported in the future?

In the 1970s, China had a sharp decline in fertility in both rural and urban areas, and fertility decline has continued essentially everywhere, producing small numbers of children and small families today, even in the countryside. Meanwhile, geographical mobility has increased for the last three decades. Young adults have left the countryside to head for cities and towns in increasing numbers, while older workers and the elderly tend to remain in the villages.

Given the low fertility, much smaller families, and movement of young adult workers to urban areas, observers are alarmed at the prospects for adequate support for China's rapidly aging population in the vast rural areas. Throughout China, financial support for the elderly is the legal responsibility of their adult children (both male and female), but in practice it is not easy to enforce this law if adult children have moved away or if they do not themselves feel responsible for their parents.

It is fortunate that the people of East Asia, including China, continue to have strong dedication to their nuclear and extended families. Even in the highly developed countries, areas, and cities of Japan, South Korea, Taiwan, and Hong Kong, where fertility is extremely low and urbanization very advanced, families continue to give financial and personal support to their aged members. This is a good thing, since social support systems for the elderly remain comparatively weak in much of East Asia, as they are in China.

That the culture of mutual support among family members remains central in China is surprising, since China's family was intentionally undermined by government policies during the decades of the 1950s through the 1970s. Amazingly, China's family structure and central role in people's lives has continued right through to today.²³

Even when rural young adults move away from their natal villages, in general they continue to return home for holidays, communicate with their rural families, and send remittances to their natal families if they can. Sometimes a rural-to-urban migrant leaves spouse and child or children in the family household in the village, where extended family members can help raise the children. Out-migration of workers from village households to towns or cities is sometimes a family economic strategy, to help the rural family break the cycle of poverty or have more varied and better sources of income beyond agriculture. Having a migrant family member does not have unambiguous negative or positive effects on household incomes of the rural elderly so far.²⁴

China's strong and flexible institution of the family has demonstrated its capacity to cope with shocks and take advantage of changing opportunities. There is no reason to expect that China's families will crumble at the challenges that population aging has brought and will bring. The family in China provides security and mutual support in good times and bad. The family enables its members to take economic and educational risks that individuals on their own might not be able to do.

²³ See for example Judith Banister, Marriage and Family, *Berkshire Encyclopedia of China*. Berkshire Publishing Group, 2009, pp. 1404-1409.

²⁴ See World Bank Human Development Unit for East Asia (EASHD), *The Well-Being of China's Rural Elderly and Old Age Support*, 2009.

China Population Aging and the Economy

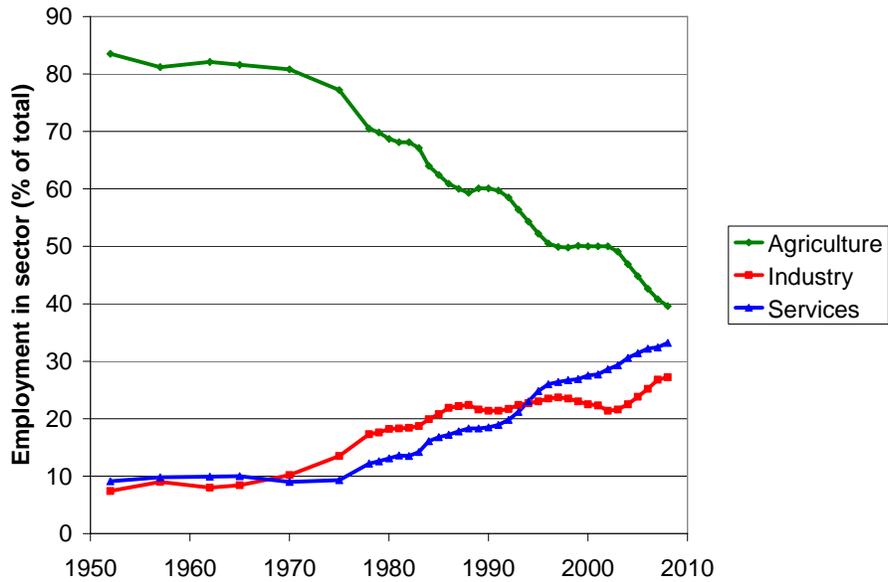
How fast and how fully will China be able to respond to its significantly increased population of elderly? The answer is important to the welfare of the Chinese people, as economic growth may be affected by the changed age distribution. The answer is also obviously relevant to the elderly, and it is also relevant to all other ages, insofar as there may be new patterns of intergenerational transfer of wealth. Finally, the answer also matters to the rest of the world, because China's economy is such a central driver of the world economy. Will demographic change slow China's pace of activity and growth? And what will happen in other countries if China's economy slows?

Our short answer to the question of whether population aging imperils economic well-being and growth in China is that the challenge posed by aging is not insurmountable, for several types of reasons. Thinking somewhat mechanistically: although aging is occurring rapidly, it is not a sudden shock, so the economy has time to adapt; the increasing burden of elderly dependency will continue to be offset by low youth dependency; and to the extent that labor shortages might tend to appear, they may be avoided by a reduction of disguised unemployment (i.e., marginally employed workers will have opportunities to become much more productive). There may also be behavioral adjustments such as increases in labor supply and education, along with strengthened family coping mechanisms in response to newly observed needs of the elderly. Population aging may also prompt institutional responses that affect retirement, pensions, and immigration. To the (considerable) extent that China's economy is responsive to changes in supply of and demand for labor, it is reasonable to expect that any potential labor shortage will induce a rise in wages and subsequently increased labor force participation – with the result that the economy will become all the more able to produce needed goods and services, including for the elderly. Similarly, we can expect that changes in labor supply and demand will affect the *mix* of goods and services produced, in a way that will tend to satisfy the expressed needs of the population, even as those needs change in the face of population aging. Finally, China may gain something by learning from the somewhat earlier aging experience of Japan and Korea.

Sectoral Trends in Employment and Productivity in China

The distribution of employment in China across the agriculture, industry, and service sectors (which China calls primary, secondary, and tertiary industries) has changed significantly since 1970 (see Figure 9). Industry and services have increased rapidly, while the proportion of Chinese working in agriculture has fallen dramatically. These figures are consistent with large-scale migration from rural to urban areas, with migrant workers finding employment in cities and towns.

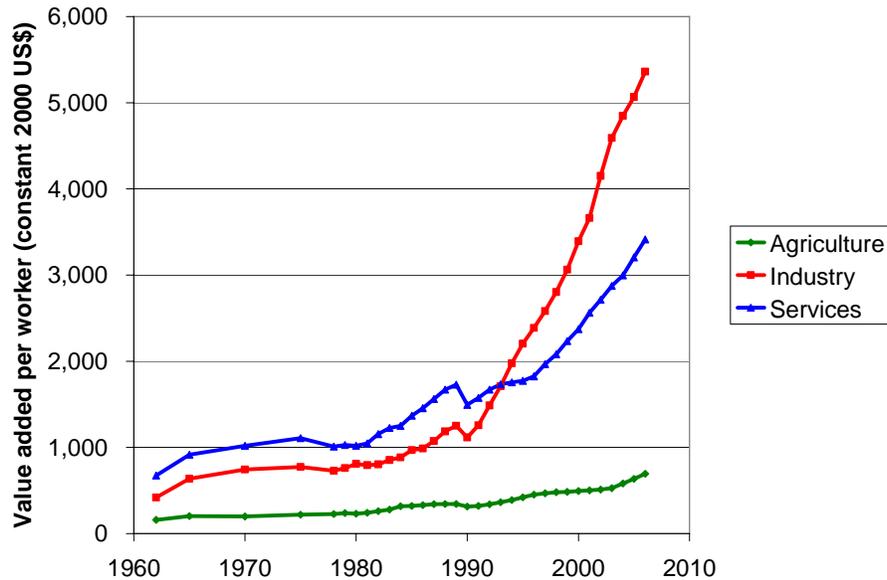
Figure 9
Share of employment by sector in China



Source: *China Statistical Yearbook 2009*, Table 4-3.

Average value added per worker varies considerably by sector (see Figure 10). Although value added per worker has increased in all sectors since 1970, the change for industrial workers has been by far the largest, both in absolute and percentage terms. In 2006, each worker in that sector produced, on average, over seven times as much as in 1970. Tertiary industry (services) also became much more productive over time, more than tripling the real value added per worker. In contrast, agriculture in China has remained the reservoir for surplus labor. With very limited per capita agricultural land, and comparatively minimal investments in agriculture, per worker agricultural productivity has increased only modestly.

Figure 10
Value added per worker by sector in China



Sources: *China Statistical Yearbook 2009*, Table 4-3; World Bank, *World Development Indicators 2008*.

Between 1970 and 1980, the final decade under the Maoist command economy, the annual average growth rate of real GDP per worker was 3.0%, whereas from 1980 to 2005 under economic reforms and the opening of China’s economy to the global economy, it was 7.2%. Analysis by Bloom, Canning, et al²⁵ finds that in the first period, productivity growth in China was driven primarily by the movement of labor from one sector of the economy (especially agriculture) to another, whereas in the latter period, such growth was driven overwhelmingly by productivity improvements within sectors.

These workforce transformations are relevant to the ongoing and impending aging of China’s population. The shift of labor out of agriculture into industry and services has helped to raise labor productivity in China throughout the entire period 1970 to the present. In China, partly as a result of economic and political policy decisions, surplus labor has been and is concentrated in agriculture, and labor productivity in China’s agriculture remains low, compared to productivity in the secondary and tertiary parts of the economy. In 2008, 40% of workers were still in agriculture, so there is room for further labor productivity improvements via labor movement from the primary sector into the secondary and tertiary sectors. Raising labor productivity in the future, which will happen both through more inter-sectoral movement of labor and through further productivity improvements within sectors, will help ameliorate impacts of the future reduced share of the population in working ages and the increased proportion of population who are elderly. So far, China has done a masterful job of raising labor productivity through both mechanisms.

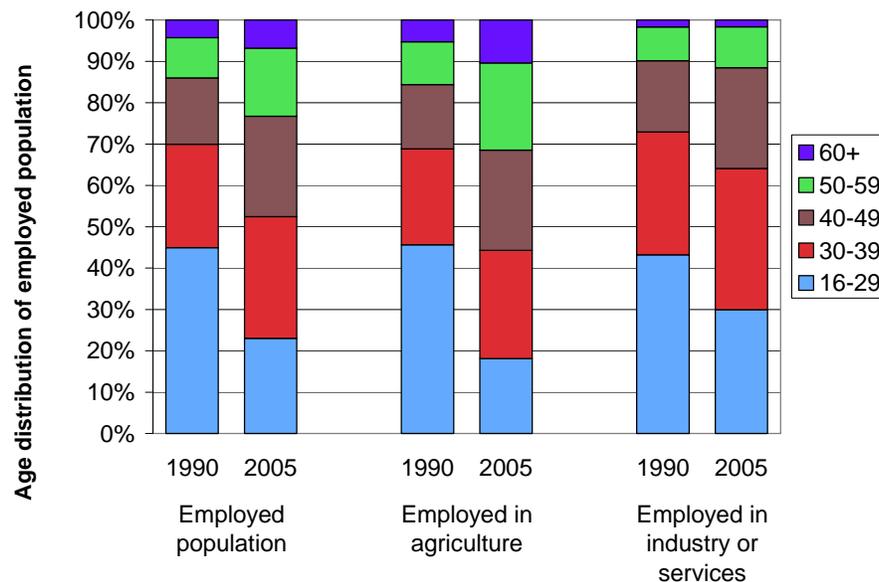
²⁵ Bloom, David E., David Canning, Linlin Hu, Yuanli Liu, Ajay Mahal, and Winnie Yip, ‘The Contribution of Population Health and Demographic Change to Economic Growth in China and India’, *Journal of Comparative Economics*, forthcoming 2010.

The Age Structure of China's Workforce

Two decades ago, China still had a young workforce. The employed population was strongly concentrated in the youngest working ages of the late teens and 20s (Figure 11). By 2005, this age group constituted a much smaller proportion of China's working population. This big change reflected two powerful trends. First, the steep fertility decline of the 1970s was already reflected in the reduced numbers of people newly entering the workforce in the 1990s and beyond. Second, greatly increased educational attainment in urban China, and even in the rural areas, kept young adults in school (secondary schools, colleges, and universities) much longer so that they entered employment at older ages.

Figure 11 compares the age structures of China's working population in agriculture and outside of agriculture in 1990 and 2005. As young workers have moved out of agriculture into industry and services during the most recent two decades, the age structure of China's remaining agricultural working population has become older. Meanwhile, the non-agricultural employed population has become more concentrated in young adult working ages than the agricultural workforce, as shown in Figure 11.

Figure 11
Age distribution of China's employed population by year and sector



Sources: China national 1% sample survey, Nov. 2005. Table 5-2 Employment by age, sex and industry; 1990 Census Data, Table 6-9 Employed Population by Age, Sex and Industry.

There remains considerable opportunity for freeing from agriculture a continuing stream of adults in young and middle working ages in the coming decades. Mechanization is low in China's agriculture, partly by design, because the government is mindful of the need to provide jobs for its enormous labor force. Abrupt or rapid mechanization in agriculture could release too many workers who have too few opportunities outside agriculture. However, in the future, if more workers are needed in more productive sectors of China's economy, even slightly more

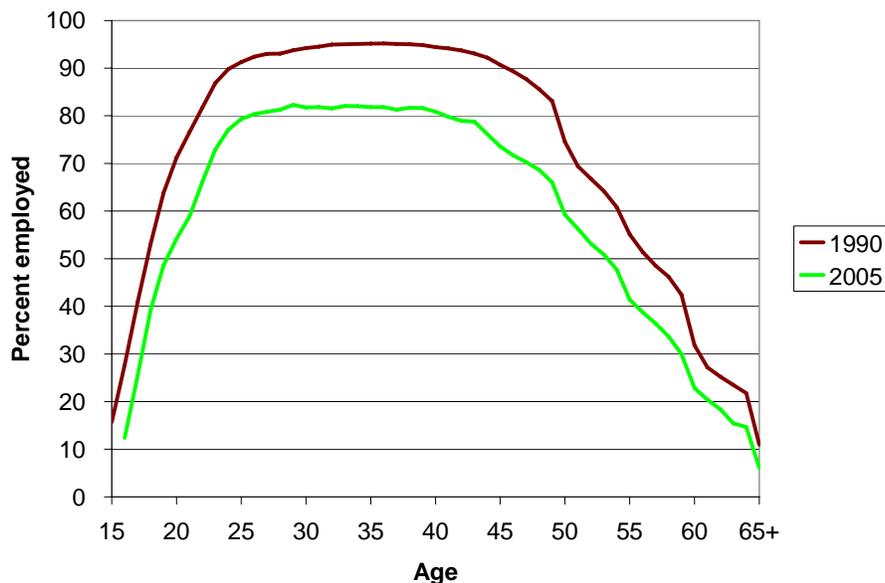
efficient agricultural production could readily release them. This reserve supply of workers could become important in ensuring that China will be able to produce the goods and services it needs as its population ages.

Employment Participation Rates in China's Cities²⁶

In the cities of China, there is also great potential for higher employment participation rates at most adult ages, which would increase the number of workers (or slow the decline in number of workers) as population aging proceeds. Since 1990, there has been a clear drop in city employment participation (Figure 12), based on data from China's 1990 population census and the 2005 1% national sample population survey. Some of this trend is expected and is a good thing. For example, as city young adults in their late teens and their twenties have stayed in school – senior secondary school, technical colleges, universities, and professional schools – the age-specific employment participation rates in those age groups have declined. This is an important part of economic modernization and not a problem. Secondary and higher education raise the human capital of the workforce.

Some city employees in their 50s and 60s want to leave the workforce if and when they have the opportunity. This choice could also be seen in a positive light, both because leisure can raise their quality of life and because their retirement could open up job opportunities for younger workers. Early retirement in cities is facilitated by the low legal retirement ages of 60 for men, 55 for women in white-collar jobs, and 50 for women in blue-collar jobs.

Figure 12
City Employment Participation in China, 1990 and 2005, by Age



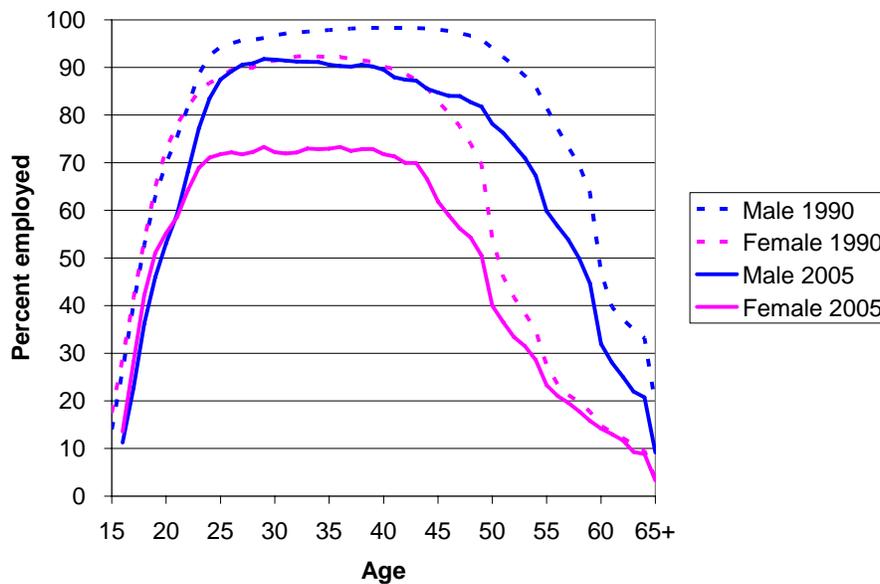
Sources: China 1990 population census and 2005 1% sample population survey.

²⁶ This section is based on research by Judith Banister for The Conference Board's China Center for Economics and Business.

However, for most city residents from their 20s into their late 50s or 60s, being unemployed or out of the workforce or retired at early ages has been thrust upon them during the 1990s or in the new century because state-owned and collective enterprises have laid off massive numbers of workers. China's cities are very short of jobs for many millions of people who want employment today. Every year for decades, China's leaders have been struggling to find ways to increase jobs and minimize unemployment and layoffs in the cities.

Figure 13 shows the decline in city employment participation rates by age and sex from 1990 to 2005. Employment rates of men have dropped in all age groups, especially from the late 30s and in all older ages. Women in cities have been even more strongly affected. Employment participation rates for females in their 20s through their early 50s declined sharply from 1990 to 2005, even though fertility levels in cities are lower now than they were in 1990. These data are consistent with persistent reports of discrimination against women in city employment in recent decades.

Figure 13
City Employment Participation in China, 1990 and 2005, by Age and Sex



Sources: China 1990 population census and 2005 1% sample population survey.

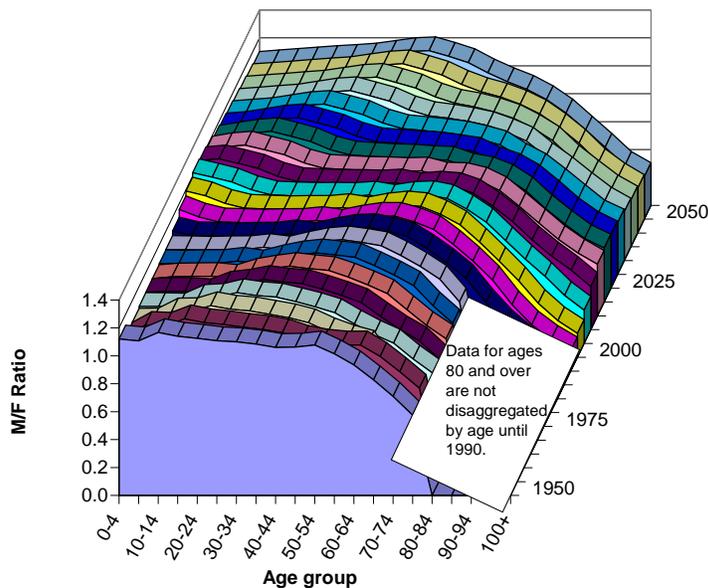
What these data suggest is that China has an enormous reserve army of potential workers not only in rural areas, but also in the cities. Chinese culture today has a strong Communist norm that essentially all working-age adults, men and women, are expected to be in the labor force and expect themselves to be working and earning. As population aging escalates in China, willing workers of both sexes can be brought into or back into employment to ameliorate any emerging shortages of workers in the economy.

Gender Imbalance and Population Aging in China

The gender ratio is a frequently discussed topic in China because of the high ratio of male to female births and excess female mortality at young ages, as compared with other countries. This ratio is of course reflected in a continuing disparity over time, with the ratio for each birth cohort setting the stage for a continued (but changing) disparity between the number of males and females for a given age at a particular time. Figure 14 shows the evolution of this ratio over time and across age groups. The ratio for 0-4 year-olds was closer to normal during the 1950s through the early 1970s when fertility was high and ideological emphasis on male-female equality was strong. Since then the sex ratio among young children has risen. Troughs and peaks in the birth ratio are seen as waves in the chart. Because females live longer than males, the ratio dips in all years among the elderly.

Today there are over 120 boys per hundred girls from infancy through age 10 in China, and about 116 boys per 100 girls at ages 10-18.²⁷ As these children grow to adulthood, young men will be even more numerically dominant in the young adult ages than today. In China, men tend to be more fully involved in the employed workforce than women, in part because men face less discrimination. We can predict comparatively high availability of workers in these cohorts in the coming decades, which can help support the aging population.

Figure 14
China's Male/Female Ratio by Age and Year



Source: UN, 2009

A problematic aspect of the dearth of women in China is that tens of millions of men who want to marry cannot do so. In the villages and towns, where old age social security systems are weak or nonexistent, people need spouses and grown children to care for them when they are elderly. Almost all women in China can and do marry and have children; as the women grow old, they

²⁷ *China Population & Employment Statistics Yearbook 2009*, Table 2-3, p. 36.

have adult children and grandchildren to help support them. The men who cannot marry tend to be poorer men in poorer villages. Numerous Chinese demographers and economists have expressed their concerns for three decades, most recently as follows:

More than 24 million Chinese men of marrying age could find themselves without spouses in 2020, state media reported Monday, citing a study that blamed sex-specific abortions as a major factor. The study, by the government-backed Chinese Academy of Social Sciences, named the gender imbalance among newborns as the most serious demographic problem....“Sex-specific abortions remained extremely commonplace, especially in rural areas,” where the cultural preference for boys over girls is strongest, the study said....Researcher Wang Guangzhou said the skewed birth ratio could lead to difficulties for men with lower incomes finding spouses....Another researcher...., Wang Yuesheng, said men in poorer parts of China would be forced to accept marriages late in life or remain single for life, which could “cause a break in family lines.” “The chance of getting married will be rare if a man is more than 40 years old in the countryside. They will be more dependent on social security as they age and have fewer household resources to rely on,” Wang said. The study said the key contributing factors to the phenomenon included the nation’s family-planning policy, which restricts the number of children citizens may have, as well as an insufficient social security system. The situation influenced people to seek male offspring, who are preferred for their greater earning potential as adults and thus their ability to care for their elderly parents....the study urged the government to relax the so-called “one-child” policy....²⁸

Gender imbalance is therefore relevant to coping with China’s aging population in the future. The comparative surplus of men in future adult cohorts predicts high labor force participation rates, but poor single men in poor villages may not have much family to depend on for old age support.

Education, Human Capital, and Population Aging in China

For six decades, China’s government has strongly promoted literacy and education of the whole population. At first, emphasis was on literacy classes, primary education, and narrowing the chasm between educational opportunities for boys and girls. Focus on these basic goals has never stopped, with the result that today, 99% of both boys and girls in China enter primary school, at least 97% of boys and 96% of girls get to fifth grade, and 99% of both men and women at ages 15-19 are literate today.

As China has made literacy and primary education nearly universal, it has turned its attention to expanding secondary and tertiary education over time. The educational attainment of China’s working-age population has thus risen dramatically in the short period of 1 ½ decades (see Table 3). Particularly notable is the share attaining post-secondary education, which rose from 2.0% in 1990 to 6.9% in 2005, with women gaining considerable ground on men during that period.

²⁸ AFP, Skewed China Birth Rate to Leave 24 Mln Men Single, Jan. 11, 2010, published in Yahoo! News. http://news.yahoo.com/s/afp/20100111/hl_afp/chinapopulationmenmarriage;_ylt=AvYxHGrs8Dv701FWtLLokWB0fNdF

Table 3
Educational Attainment of China's Population Ages 15-64, 1990 and 2005 (Percent)

	1990			2005		
	Total	Male	Female	Total	Male	Female
Junior middle school	32.5	38.2	26.5	44.5	48.3	40.7
Senior & specialty high school	11.8	13.9	9.6	15.7	17.7	13.7
Professional college	1.3	1.6	0.8	4.5	5.0	4.1
University	0.8	1.1	0.5	2.2	2.6	1.8
Graduate school				0.2	0.2	0.1
Total share attaining junior middle school or higher	46.4	54.8	37.4	67.2	73.8	60.5
Total share attaining post-secondary education	2.0	2.7	1.3	6.9	7.8	6.1

Notes: Each figure above the row designating the Total is the percent of the 15-64 population that has attained that level of education but no higher. Totals reflect rounding.

Sources: China National Bureau of Statistics, *Tabulation on the 1990 Population Census of the People's Republic of China*. Beijing: China, Statistical Publishing House, 1993, Vol. 2, pp. 2-5, 112-116, 132-136;

China National Bureau of Statistics, *Tabulation on the 2000 Population Census of the People's Republic of China*. Beijing: China Statistics Press, 2002, Vol. 1, pp. 633-640; Vol. 3, pp. 1892-1893, 1895.

China National Bureau of Statistics, *2005 National 1% Sample Survey Data*, pp. 78-81, 185-192, 827-831, 840.

Not shown in this table is the difference in attainment at higher education levels between young city dwellers and the young portion of the Chinese population as a whole. As of 2005, more than 30% of people aged 20-24 living in cities had attended technical colleges or universities – a figure that is much higher than for older age groups. The corresponding figure for the country as a whole is 14%.²⁹

The latest available data (see Table 4) show that the vast majority of China's employed population today has attained at least some schooling and most have gone beyond primary school. The human capital of China's workers is already impressive compared to most other developing countries. Continuing progress in raising human capital will further increase the productivity of China's future workforce and help the country cope with the aging of its population.

²⁹ 2005 1% sample survey, Tables 4.1 and 4.1a.

Table 4
Educational Attainment of Employed Persons in China by Sex, Nov. 2008 (Percent)

	No schooling	Primary school	Junior secondary school	Senior secondary school	College, technical college	University undergraduate	Graduate & higher level
National	5.3	27.4	47.7	12.7	4.4	2.3	0.2
Male	3.0	24.0	50.9	14.7	4.6	2.5	0.2
Female	7.9	31.3	44.1	10.4	4.1	2.0	0.2

Source: *China Population & Employment Statistics Yearbook 2009*, Tables 3-1 to 3-3, pp. 157-159.

Notes: Each figure shows the percent of the total, male, or female employed population of China who attained that level of education but no higher. Data are from the China Population and Labor Force Survey of November 2008. The survey showed that men constituted 53.6% of China's employed population, and women 46.4%.

Population Aging Across China

The demographic and economic chasms between rural China and the country's cities and towns shape the biggest differentials in future population aging and economic growth. But in addition, differences across provinces and regions of this enormous country also are important.

Labor migration moves workers from rural to urban China, but also from inland provinces to the coastal provinces. The provinces near the coast are more economically developed and have rich labor resources, including both native-born workers and inter-provincial migrant workers. These provinces are better positioned to adjust to future population aging. They are better able to lure the employees they need from the poorer provinces, and they have more wealth to work with and better economic prospects.

Provinces in central and western China are in general less prosperous than those on the coast, partly because they have received less domestic and foreign investment. Privatization and globalization have not proceeded so far, and provinces far away from the coast tend to be more stuck in command economy principles and bureaucratic inertia. However, a compensatory mechanism at work is that fertility tends to be somewhat higher in central and western China than in coastal China, so a higher proportion of the population is now made up of children, who will become larger local-born working-age cohorts in the future. Many millions of labor migrants in China do not leave the provinces where they were born, but simply migrate to nearby towns or cities in the same province. Pure demographic population aging may therefore be less pronounced in central and western China than in coastal China in the next few decades.

China's northeastern provinces of Heilongjiang, Jilin, and Liaoning are highly urbanized, giving them some economic advantages, but they are also China's rust belt. Much of China's industrialization began in these Manchurian provinces when they were under Japanese control before and during World War II. Mao's China built upon this legacy to develop much of new China's industries in the northeast. But now most of these old factories are out of date, and it is

an ongoing struggle to modernize them. Millions of workers who were laid off from outmoded factories in the northeast were promised pensions and must now be supported by some means.

In its recent five-year plans and yearly targets and implementation measures, China's government has tried to ameliorate the disparities between China's leading coastal provinces and the western and northeastern and now the central provinces, with some success. Annually, gradual progress has been reported on developing the western regions, rejuvenating old industrial bases, and completing more highways, railways, and airports to improve transport and national economic integration.

Spatial heterogeneity in demographic patterns and trends among China's provinces and regions is not likely to prove crippling for China. Population aging may be more extreme and rapid in the provinces that have had lower fertility in recent decades, but overall those same provinces are more economically advanced and financially able to cope with their aging population structure.

China Population Aging in International Perspective

The population aging that China is experiencing, and that will be pronounced in the coming decades, is not a new or unique phenomenon. Fertility has dropped to low or very low levels in developed countries, transitional countries, newly industrialized countries, and some developing countries in Latin America. Populations are aging earlier in most such countries than in China. China is already studying and learning from the policy successes and failures of myriad other countries with aging populations today.

Japan

Japan is a highly relevant example for China. It has an East Asian culture with many similarities to Chinese culture. It has a large population of 127 million and is a densely populated country like China.

The population aging process that Japan has already experienced is extreme. Japan has achieved the longest life expectancy of any country on the planet. Its fertility level dropped in the late 1940s and the fertility decline accelerated in the 1950s. By the early 1960s the total fertility rate had dropped to the replacement level of about 2 births per women. Japan's steep fertility decline of the 1950s was two decades ahead of China's even more dramatic downward fertility curve in the 1970s. We can generalize that China's population aging process is therefore following behind Japan by two decades, though the Japanese case is even more severe because Japan's fertility and mortality are so very low today. Perhaps China's fertility level will not go so low soon.

Today Japan's total fertility rate is only 1.2 births per woman. The birth rate is below that of the low death rate, and Japan's population size has actually been dropping since 2004.

The Japanese people and government do not welcome immigration. Therefore, population aging is not being ameliorated at all by net immigration into Japan, and there are no apparent prospects

for such “replacement migration” as even a partial solution to Japan’s population aging dilemmas.

Today 22% of Japan’s population is ages 65+, rising to 28% by 2020. How is Japan coping with its age structure that is so old today and rapidly getting older?

Japan has the advantage that it faces the severe aging of its population when it is already a rich country. China’s leaders and economists argue that China is disadvantaged by comparison. Using purchasing power parity measurements, China is a middle-income or lower middle-income country today. But China’s per capita income continues to grow. China has decades before it will hit the aged or old population structure that Japan and many other developed countries are already dealing with today.

Japan established a universal medical care system and pension system in 1961.³⁰ Japan also has a Long-term Care Insurance Scheme that was implemented in 2000 and for which the costs have been increasing at an astonishing rate since its inception.

There have been repeated improvements in Japan’s pension benefits. The system is complicated and has many components. It was a pay-as-you-go system until 2001, when this was supplemented by a Defined-contribution Pension System. China’s scholar Xiaochun Qiao suggests that China could learn from Japan’s complete pension system as follows:³¹

- Establish a Basic Pension Scheme that covers all the elderly in China, modeled on Japan’s scheme, funded by the central government, employees, and employers.
- Provide an additional pension for farmers and self-employed persons like that in Japan.
- For employees, study Japan’s corporate defined-benefit and defined-contribution and tax advantaged private pension schemes for usable models.

There are serious problems in Japan’s pension systems, however.³² The pension taxes on the workforce are so burdensome that workers try to avoid paying into the system, even though the payments are required. Many, especially young workers, feel that they shoulder too great a burden for Japan’s elderly today, and fear that the funds will not be available when they themselves grow old.

Japanese culture expects families, especially adult women in families, to care for the elderly. As families have become smaller, there has been declining support by adult children, so Japan’s government has adopted policies to try to strengthen family responsibilities for their aged

³⁰ Details in this paragraph are from Naohiro Ogawa, Makoto Kondo, and Rikiya Matsukura, Japan’s Transition from the Demographic Bonus to the Demographic Onus, presented at the International Conference on the Demographic Window and Healthy Aging, Beijing, May 2004.

³¹ Xiaochun Qiao, China’s Aging and Social Security of the Elderly: With Reference to Japan’s Experiences, Japan External Trade Organization, Institute of Developing Economies, Visiting Research Fellow Monograph Series No. 388, March 2004.

³² Review and Outlook: Japan’s Failed Pensions, *Asian Wall Street Journal*, May 24, 2004, p. A11.

members.³³ But it is expected that the ability of families to care for the elderly will continuously weaken.

In Japan's health system, half of health expenditures are for people ages 65 and older.³⁴ This proportion is expected to increase to 65% by 2025. Japan's system is a single-payer system. It seems to contain health care costs effectively; 8% of GDP in Japan is spent on health care, which is low compared to other OECD countries. Fees are tightly controlled. There are no waiting lists. Therefore, China should look at Japan's universal health system as a possible model for how China could develop its health system.

About 66% of Japan's population is in urban areas. Parts of rural Japan are suffering from out-migration of working adults and extreme aging of the population left behind, but there has been little improvement in dealing with this issue.

United States

The US is one of the most developed and richest countries in the world. With 309 million people, it is the world's third most populous country after China and India.

Myriad US policy-makers, journalists, scholars, and others are concerned about the rising costs of population aging in the country. Members of the leading edge of the large baby boom generation born after World War II have begun retiring, and the number of elderly is set to increase.

Fortunately for the US, compared to most developed countries, European countries, transitional countries of the former Soviet bloc, and newly industrialized countries of Asia, the US does not have and does not face in the future a major problem of population aging.

Why not?

First, the US, like Canada and Australia, is traditionally a country that welcomes immigration. The attitudes toward immigration have ebbed and flowed over the decades and centuries, but for the most part the US has been relatively open to immigrants. Net immigration to the US each year is far larger in absolute numbers than for any other country. Legal and illegal migrants pour into the US every year, primarily for economic and educational opportunity, or simply because the migrants perceive life in the US to be better for them and their families and friendship networks than life in their home countries. Migrants to the US tend to be young and middle-aged adult workers who, immediately or eventually, bring their spouses and children and other family members into the US if they can. This constant influx of immigrants in the young adult and middle age groups helps prevent severe aging of the US population.

³³ Naohiro Ogawa and Robert D. Retherford, Shifting Costs of Caring for the Elderly Back to Families in Japan, *Population and Development Review*, 23, pp. 59-94.

³⁴ Naoki Ikegami, Financing Healthcare in Rapidly Aging Japan, presented at the Conference on Aging Asia, Stanford University, Feb. 26, 2009.

China, of course, has a much larger population than the US. Even if China decides to strongly welcome immigrants, which currently is not the situation, immigration of young adults would not be enough to significantly change China's age structure. Even so, if China became more open to immigration from abroad, it could selectively ameliorate labor shortages that come up in the economy in the future.

The second reason why the US does not have a major population aging problem is that its fertility level is at replacement level, just over 2 births per woman, higher than fertility in China.

The social safety net in the US is not as deep and broad as in most other developed countries. The US has an old age Social Security system funded by required deductions from employee paychecks. The system does not provide universal coverage. Workers have to pay at least a certain amount of money into the system for 10 years or more before qualifying for Social Security benefits. The amount of the benefit is determined by how much the worker paid in. The worker's spouse is also covered.

Full retirement age was age 65, but is gradually rising to age 67. Workers can easily find out from the Social Security web site what full retirement age will apply to them, depending on what year they were born. Workers can choose to retire as early as age 62 and receive Social Security, but the amount will be reduced well below the amount at full retirement age for the rest of their lives.

As the US population has been aging, there have been periodic projections that the Social Security Trust Fund will run out of money at a certain date if the system is not changed. These concerns have led to increases in the Social Security tax, which is the percent of salary deducted for Social Security payments, now at 6.2% of gross salary up to a certain total annual gross income, and the employer pays the same amount into the system for each employee at the same time.

The US Social Security system is popular and is working. The main problem is that it does not cover the whole elderly population.

China could learn from the US system regarding making its own pension system a nationwide one, rather than the local piecemeal system China has now. It is also important for China to raise its legal retirement age in order to make its retirement pension system solvent. The US model of gradually raising legal retirement age, giving workers plenty of warning, is a good one for China.

The United States has very high quality medical care for those who can afford it. But the system of medical finance and health insurance coverage is wasteful, expensive, bureaucratic, and it leaves tens of millions of residents without any medical insurance. The US is not a good example for China regarding how to run a health insurance or health care system.

The US has a medical finance system called Medicare for those who reach age 65, but eligibility is not universal. Like Social Security, workers have to pay into the system for 10 years to become eligible. The in-patient hospital care part of Medicare is free at age 65 and older for

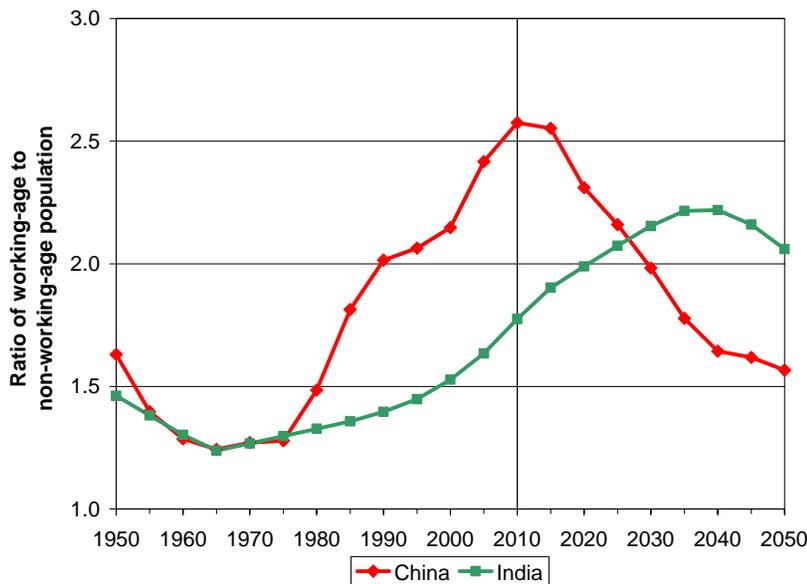
those who qualify. The system is funded by required deductions of 1.45% from employee paychecks, and the employer has to pay the same amount into the system for each employee. Other parts of Medicare require payment of monthly premiums and co-payments for health services and prescription medicines. US residents who qualify for Medicare complain about the complexity and costs of the system, but they generally strongly defend their coverage and do not want to lose or weaken the Medicare system. Medicare is not an efficient public system of health care for China to follow.

However, many aspects of the US medical system and pharmaceutical R&D system lead the world in terms of technology and cutting-edge medical care. The rest of the world continually learns from US medical innovation and applies US health discoveries to populations and patients outside the US. China also regularly learns from US medical research.

India

India is the second most populous country in the world. China and India together constitute 37% of the global population today and a whopping 45% of the population in developing countries. In essentially all components of demographic transformation, China has been leading India by decades. Declines in fertility, mortality, and population growth rates have been slower and more gradual in India than China. As a result, India’s age structure has not been nearly so concentrated in the working-age groups (defined here as ages 15 to 64) as has China’s (Figure 15). This “demographic window of opportunity” in China – so called because of the potential economic benefits conveyed by a high working-age share – has lasted since the late 1970s and will remain more favorable than in India until after 2025.

Figure 15. Ratio of Working-age to Non-working-age Population, China and India



Source: UN, 2007

China is facing population aging much earlier than India. By the time India confronts major issues of population aging, that country will have the China example from which to learn.

In many other aspects of socioeconomic development, India is also trailing behind China. India's economic initiatives to free it from prior bureaucratic and socialist torpor began a decade and a half after China's economic reforms. The population of India is today vastly poorer than that of China. Rural-to-urban migration and urbanization in India are far less extensive and slower than in China. Literacy and educational attainment in India trail far behind the progress in China. India's mortality rates remain much higher than China's. Though the sex ratio at birth is much more distorted in China than India, after the first couple of years of life, the status of daughters, girls, and women in all age groups and by most measures is worse in India than in China. In all these respects, India could study and learn from the China example.

Some observers have recommended that China learn from India regarding certain innovations and elements of progress, for example India's global outsourcing service sector, the development of democracy there, microloans and other banking initiatives, and more openness and less government control over the media. But India is not very advanced in preparing for population aging, nor is the situation quite as urgent as in China.

Economic Implications of Population Aging in China

In any economy, economic output depends on the presence and productive functioning of capital and labor (and this paper focuses on the availability of labor). Other factors, such as availability of technology, governance, social cohesion, foreign relations, and expectations of various types, also matter enormously, but they are not central in a discussion of aging and economic growth.

Population aging may affect output for two reasons. First, population aging means that a larger portion of the population is beyond the age at which most people stop working. If there are no compensatory mechanisms at work, there will be a smaller share of the population engaged in productive work, and total output per capita will decline. Second, the savings rate varies by age. Working-age people save the most, both because they have the ability to do so, by drawing on their earnings, and also because they have an incentive to save in anticipation of retirement. The elderly, if they are not working, typically have little income (though they sometimes receive government transfers or family support), so they have little or no ability to save. If a country has a high share of older people, the overall savings rate will tend to decline. With less savings available for investment, economic growth will tend to decline.

These factors, taken together and in the absence of any mitigating circumstances, lead to a potentially daunting situation. All things equal, an aging society will see lower growth of output per capita and a lower rate of savings. In addition, the elderly population requires care and companionship, and if these require funding, such funding will reduce the resources available for other purposes.

With China's population aging so rapidly, these factors would appear to bode ill for China's economic future. Concern has thus been raised: won't China suffer from too few working-age people supporting a large dependent population of older people? And will there be enough

savings to support the non-working elderly? There are numerous reasons to question whether the implied, potentially bleak scenario applies to China.

First, although the share of working-age people in China is set to decline, that fact in itself may not lead to a proportionate drop in the share of people working – i.e., the labor force participation ratio (LFPR).

One reason for this is that there is currently considerable disguised unemployment in China (individuals who are not counted as being in the labor force but would work if acceptable job opportunities presented themselves (discouraged workers) or workers whose productivity is much lower than their potential productivity for want of better jobs). As older workers move out of the labor force, currently unemployed or underemployed workers will take the positions that become available. Of course, replacement of retiring workers by younger workers occurs naturally everywhere, but in China the number of workers retiring will be particularly large. If they had to be replaced only by people entering the working-age years who were already likely to enter the workforce, it is true that there might be insufficient replacements. But because of disguised unemployment, there are many more workers available who will be able to step in and continue the productive activities of retiring workers. This is a crucial point: China has a reserve army of the unemployed, to use Karl Marx's phrase. This army, in migrating to the cities, has shown itself capable of stepping in and filling the slots needed to greatly increase China's productive capacity in recent decades. With the widely documented lack of jobs that still afflicts many millions in China, the retirement of a large segment of the population is unlikely to result in a situation of jobs going unfilled.

There may also be behavioral and institutional adjustments that mitigate the growth-slowing effects that an aging population might have on an economy. These types of changes take place in many countries, in various forms, and some of them may be pertinent to China.

Labor force participation may actually rise. In China, with continued low fertility, parents (and especially women) will have less need to devote time to raising children and more time to spend in the workforce. As wages continue to rise, particularly in cities, the opportunity cost of not working also rises, which could lead to more people seeking to enter or remain in the labor force. With the increase in healthy life expectancy, more people will likely be inclined to continue working to later ages than has traditionally been the case. The increased number of elderly who are not in the labor force can provide child care for their grandchildren and thereby enable the labor supply of their children and contribute to the human capital of their grandchildren. Finally, labor force participation may increase because any potential labor shortage will tend to cause wages to rise, thus enticing more people to enter the labor market.

The division of labor within the family, and the sharing of resources across generations, are also worth noting here. Within-family labor and consumption dynamics can smooth individuals' consumption and welfare trajectories. If demand for labor rises, these dynamics can release family members to increase their participation in the labor force. One cautionary note here: The labor force participation rate of women aged 15-64 in China is 76%, which is higher than for most countries in the world, and considerably higher than the average for middle-income

countries (63%),³⁵ so there is less scope than in other countries for increasing female involvement in the labor force. Nevertheless, given the greatly reduced employment participation of adult women in China's cities during the last two decades, there is much room for increasing female workforce participation there in future decades.

There may be institutional or cultural changes to eliminate work disincentives at older ages. In many countries, pension systems are actuarially biased in a manner that induces people to stop working at an earlier age than they would otherwise choose. This happens, for example, when the marginal return on continued working falls too low to provide an incentive for continuing to work. In China, only a fairly small portion of workers are covered by pensions, but the rules defining retirement age may change, in response to longer healthy lifespans, workers' desires (either to work or to have more income), or the perceived economic needs of the country. More significant, perhaps, would be a change in cultural norms regarding the age at which people stop working. These norms differ between urban and rural areas. City workers now expect to retire at 50 or 55 for women and 60 for men, but these longstanding low retirement ages could be raised gradually. In the cities there is likely scope for a change in expectations about the age at which people stop working.

Savings rates. In many countries, two factors have combined to increase savings rates: (a) the expectation of longer periods of retirement, and (b) fewer (and more mobile) children to provide financial support and care/companionship to elderly parents. These circumstances prevail in China, but that does not automatically mean that savings will increase. The reason is that savings rates are already extremely high in China, compared with virtually any other country. In fact, economists and government policy-makers and business leaders in China are trying to persuade families to increase consumption and decrease the hoarding of cash.

Although there is no hard, textbook limit that constrains the level of savings, there may be one or more reasons to think that there is little room for further increases in China. However, savings could perhaps be organized in a manner that would lead to greater old-age economic security (e.g., via government bonds that would be redeemable gradually, beginning at retirement). In addition to domestic considerations, the longstanding international imbalance in savings (in which East Asia saves and the United States borrows) may not last indefinitely. China has been under pressure to expand its domestic markets, and the United States and other developed countries may not be able to, or may not choose to, borrow more funds indefinitely. In addition, China is concerned, perhaps with good reason, about the value of its loans to the United States, and it may be unwilling to continue past practices. Locally generated savings may thus find lower interest rates available, which would put a damper on savings rates.

Investment in human capital may increase. When families have fewer children, they are often inclined to invest more in the development of each child. Because such children are able to learn faster and work at a higher level (of efficiency or responsibility), such investments are effectively a way to increase the ability of the workforce to produce goods and services. That is, productivity will rise in response to investments in human capital, so a smaller workforce will be able to satisfy the needs of an economy. In China, these factors are at play.

³⁵ World Bank, *World Development Indicators 2008*. Bloom and Finlay (op cit) cite a figure of 79% for females aged 25-64 in 2000.

Immigration may increase. In some countries, labor shortages have led to large-scale immigration. Governments and cultures differ widely on the extent to which they encourage and accept immigrants, but in some instances, immigration has led to a huge increase in a country's output. The countries of the Persian Gulf, for example, rely on massive movement of labor from South Asia. In principle, the same process could take place in China. If wages, working conditions, and living conditions were sufficiently appealing, China could attract migrant workers from other countries where unemployment is high (or where other conditions impel people to emigrate). However, as in many countries, in China there may be political or cultural barriers to large-scale immigration, at least to the extent that it would have to happen in order to provide a significant boost to the size of the labor force. As of now, China sees net *emigration* of roughly 350,000 people per year,³⁶ meaning that as a share of total population, net migration is close to nil.

Because the population of China constitutes a full one-fifth of global population, positive net immigration in the future could only marginally affect the country's overall age structure. Yet China could easily facilitate immigration of contract workers or talented employees in response to emerging shortages of particular kinds of skilled workers or specialists as its population ages in the future.

Labor supply and labor shortages: a key consideration

Most of the changes discussed above would be beneficial only if China would benefit from increased labor supply. In light of the current situation, in which China is home to millions of rural-to-urban migrants seeking employment (some of whom have returned to the countryside as a result of the global economic slowdown), increased labor supply would seem to be a problem, not a benefit. However, the rapid increase in the elderly share of the population may bring major changes to the labor supply equation. At first, as the working-age share of the population decreases, disguised unemployment may yield to a changed labor market, and millions of unemployed or underemployed workers may enter the active workforce. In addition, and as the working-age share decreases further, the changes discussed here may become particularly relevant to China; the factors that could lead to greater labor force participation may become operative, investments in human capital may see higher returns, and immigrant labor may be welcomed. The trajectory of savings rates seems harder to predict, as it depends in part on whether more people enter the labor market and have funds to save.

The bottom line: how much does aging affect economic growth?

Bloom, Canning, and Finlay³⁷ analyze the effect of population aging on economic growth in Asia. After considering the various forces that have led to population aging in China and elsewhere (lower fertility rates, rising longevity, and the effect of past variations in birth and death rates), they review the behavioral responses to aging that could modify the impact of aging on economic growth. These responses include increased participation by women in the labor

³⁶ United Nations, *World Population Prospects: The 2008 Revision*. 2009.

³⁷ Bloom, David E., David Canning, and Jocelyn Finlay, "Population Aging and Economic Growth in Asia", Program on the Global Demography of Aging Working Paper #40.2008.

market, greater investment in children's health and education, and changes in savings behavior. The authors conclude that "population aging does not significantly impede income per capita growth in Asia."

In a study that validates this conclusion for the case of China, Bloom et al.³⁸ examine the increase in annual average percentage growth in GDP per capita in China between 1965-70 and 1995-2000 and find that higher life expectancy led to an increase of 1.0 percentage points in the growth of GDP per capita and that the increase in working-age share led to an additional 1.0 percentage points. It is not necessarily true, however, that the coming increase in the elderly share of China's population will lead to a mirror-image fall in the economic growth rate. One reason, as discussed by Bloom et al.,³⁹ is that, in general, the elderly do not impose as large an economic burden on an economy as does an equivalent share of young people – perhaps because the elderly tend to contribute, if often only informally, to a family's income and well-being. Much more speculatively, the compression of morbidity may lead to a smaller increase in health expenditures on the elderly than might have been expected on the basis of increased life expectancy. Another reason that we have not examined is the possibility that an economy that has reached a higher steady-state level of income may be more flexible in adapting to and efficiently responding to the needs of all segments of the population, including the elderly.

Discussion, Conclusions, and Recommendations on China Population Aging

The pace and extent of population aging in China has caught the attention of Chinese policymakers and many others. A straightforward reaction to this phenomenon would be that a population consisting of an unprecedentedly high elderly share spells trouble for the Chinese economy. After all, there will be a very large number of older people not working and needing care, and there will be fewer working-age people to support them. In addition, with continued small cohorts of children, the working-age share will continue to fall. Who will make the products and provide the services to satisfy China's domestic demand and to staff its export industries?

These concerns demand answers, but the challenge that aging poses to the Chinese economy is far from insurmountable. We have discussed some of the factors that may help China to fare well in this new era, and we add to this discussion below. We also highlight some of the behavioral and policy adjustments that may ease the transition to an economy that can work well for a population with a very different age structure than in the past.

First and foremost, China has, at present, significant underemployed labor. For quite a long time, rural dwellers have moved to the cities seeking employment. Women who might otherwise be in the workforce find that there are insufficient jobs. And students vie for positions that will give them a good life, while often finding that they have to accept work that does not use their skills.

³⁸ Bloom, David E., David Canning, Linlin Hu, Yuanli Liu, Ajay Mahal, and Winnie Yip, 'The Contribution of Population Health and Demographic Change to Economic Growth in China and India', *Journal of Comparative Economics*, forthcoming 2010.

³⁹ Bloom David E., David Canning, and Jocelyn Finlay, 2009. "Population Aging and Economic Growth in Asia," in *NBER-EASE Volume 19, The Demographic Transition in the Pacific Rim*.

As older workers retire, younger ones will take their places. But with so many people set to enter the post-work phase of their life, compared with the number who are entering their working-age years, the economy will need to turn to those who are currently underemployed. Fortunately for China, there are many such people. And just as significantly, Chinese industry has shown that it is very good at taking in new workers and melding them into China's highly productive work environment.

Of course, there are limits to this process. Without any changes in people's economic behavior or in policies that affect education and retirement and labor migration, the necessary alignment between labor supply and labor demand may not be realized in the most optimal fashion; for example, although wages and the production of goods and services will indeed adapt in response to population aging and the entry of new workers into the workforce, a strengthened and broadened education system that ensured higher levels of attainment, particularly in rural areas, might lead to a more productive economy and to less economic vulnerability among the population. In addition, even if the currently underemployed are more fully absorbed into the labor market, the new entrants may not be as productive as those who are already working – not because they are new, but, in some instances, for the reasons that kept them out of the labor market in the first place. For example, those least skilled, who have not found employment to date, may have poor productivity when they are working. Similarly, newer rural-to-urban migrants may be less well equipped to enter urban labor markets than their predecessors. In order to more effectively use the workforce China has and will have, the country needs to emphasize strong education and on-the-job training.

Second, there is scope for increasing the labor force participation rate via increases in wages. As Chinese industries become increasingly productive and as Chinese citizens seek increasing quantities of goods and services, upward pressure on wages is likely. This pressure can be expected to attract more individuals to the labor force.

Third, China's fertility rate of 1.8 children per woman is one of the lowest in the developing world. As China's population size begins to stabilize, policymakers may find that an easing of policies that restrict births – with the goal of stabilizing the working-age share of the population – would be beneficial for the Chinese economy in the long run.

Fourth, it is reasonable to expect that people may modify their behavior in response to demographic change. In expectation of longer periods of retirement, savings vehicles may be chosen with retirement planning in mind. With continued small families, it is conceivable that more women will seek to enter the labor force – a trend that would be abetted by longer-lived grandparents assuming greater roles in childcare. Ever-greater emphasis on improving the health and education of the young will make newer generations all the more fit for productive work.

Fifth, China may change some of its policies and practices in an effort to boost the size of the labor force. Education might become better attuned to the needs of developing industries. Governmental and cultural expectations could change in ways that lead to people working to later ages than at present. Government programs could seek to spur urban job creation, either through direct government employment or by subsidies or other incentives to private enterprise.

Finally, immigration, though not currently a factor in the Chinese economy, could become so if policies were altered to encourage the entry of needed workers.

Learning from others and looking ahead

Other countries are facing much the same aging issues as China. Japan, for example, has a population that has aged even more extensively than China's. But Japan is a highly developed country; accordingly, it has more resources to draw upon to support the elderly. And, despite Japan's economic woes, its markets and financial structure are much more developed than China's, which may make it easier for Japanese corporations and workers to adopt, and then to adapt to, whatever policies are needed to respond to the challenge of aging. If China is to learn from any other countries, it may want to keep a close eye on Hong Kong, Singapore, South Korea, and Taiwan, none of which prepared well (in terms of institutional adjustments) for population aging.

In the end, although China may benefit from studying other countries' experience with aging populations, this type of learning may be somewhat restricted, if only because China is so unique. The country has a political system that has gone through turmoil in the last half century but that now has reached a greater degree of stability (although ongoing tensions leave the medium-term evolution of the system uncertain). Its vibrant culture has blossomed in a way that has fit well with its emergence as an economic power, and whatever changes are to come will surely be consistent with that culture. The country's strong ethos regarding both work and family would seem to augur well for future economic security and growth. Models imported from abroad may hold lessons, but the adoption of any practices from other countries will need to mesh well with Chinese sensibilities.

For the next few years, China's policymakers might do well to focus on a careful assessment of the likely evolution of the factors discussed in this paper, were there to be no government intervention. Building on this, they could make proposals for ensuring the preservation of a productive, viable, appropriately sized workforce, and discuss these proposals broadly throughout Chinese society. Policymakers may want to move slowly and not tinker too aggressively with the Chinese economy – which, having boomed for many years, is now showing its continued strength by rapidly recovering from the world financial and economic crisis. Changes in economic policies and practices may be called for, but sudden lurches are unnecessary and may be inadvisable.

As noted at the outset, China's economic growth rate is expected to slow in the coming decades. But the analysis we have presented here says that although population aging may play some role in such slowing, it will not be a major cause.

Recommendations

The analysis in this paper leads to the following proposals for immediate action to address future population aging in China:

- Research, design, and implement structures that allow China's individuals and households to save for retirement, with the vehicles protected from inflation and secure from theft and corruption, possibly held as personal special accounts in China's major banks or as government bonds that would be redeemable gradually, beginning at retirement.
- Announce that legal retirement ages will be gradually raised for cohorts heading for retirement in the future, with emphasis on closing the female-male gap in retirement ages and achieving a uniform older full retirement age in the mid-60s for both sexes, despite current shortages of city jobs for workers in their 50s and 60s.
- Further strengthen the population coverage, financial adequacy, and especially the dependability of China's social safety net for city, town, and rural pensions and health insurance.
- Relax the one-child policy and the two-child limit where they are in force, to help provide more young adult workers in the future and to minimize sex-selective abortion and discrimination against daughters.
- Address the rise of noncommunicable diseases by designing and implementing programs to reduce hypertension, smoking prevalence, and unhealthy weight gain.
- Continue raising the human capital of China's workforce by universalizing the completion of junior middle school education, and by increasing opportunities for senior middle school, technical college, and university-level education for the rural and town population as well as for youth in cities. Make secondary and post-secondary education more affordable.
- Put new measures in place and expand measures to retrain and retool workers or potential workers whose skills are obsolete or inadequate, so that they can more fully serve the needs of the economy and themselves.
- Aggressively reduce barriers to domestic mobility in China, so that laborers and skilled and talented workers can easily move to where the jobs are without residency restrictions and problems.
- As smaller cohorts of young adults enter the workforce in the coming years, labor shortages may temporarily emerge or increase in certain provinces, regions, or economic subsectors. When appropriate, in areas where rural education has advanced, speed the mechanization of agriculture to free up labor for more productive use in industry or services.
- Consider whether there are any talent or labor shortages current or looming in China's economy, and set up policies and efficient programs to welcome desired migrants to work in China's mainland economy.
- Continue learning from other countries, especially East Asian and Southeast Asian countries, about their policy successes and failures in preparing for and coping with ongoing population aging, and implement best practices from abroad that are appropriate for China.