Challenge Facing China's Economic Growth in Its Aging but not Affluent Era

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Abstract

Demographic transition has occurred more rapidly in China than in most developed countries. As the population ages, the growth rate of the working age population has started to decline and the absolute quantity of the working age population will begin to shrink after 2015, which will inevitably result in structural labor shortage. Under 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.

Key words: demographic dividend, demographic transition, growth sustainability
JEL codes: J1, J3, J21, O4

I. Introduction

As a result of the strictly implemented one-child policy, China has completed a demographic transition within approximately 20 years, a very short period of time when compared to most developed countries. As a continuation of the first stage of transition from high death rate, high birth rate and low growth rate to low death rate, high birth rate and high growth rate, which was completed in the 1950s, the second stage of transition from low death rate, high birth rate and high growth rate to low death rate, low birth rate and low growth rate was accomplished in the period of 1980-2000.

The indication of this transition's success is the decline in the total fertility rate (roughly read as numbers a woman gives birth in her entire life) from 6 in 1957 to 2.3 in 1980 and then 1.7 since the 1990s. The current fertility level in China is far lower than that in developing

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countries and parallels with that in developed countries in the mid 1990s. Since 1998, China's population growth rate has been below 1 percent and declined to 6 per 1000 in 2004. The rates are even lower in some advanced municipalities (e.g. 0.7 per 1000 in Beijing and zero in Shanghai). A consequence of this process is the rapidly aging population. In 2000, when the 5th National Population Census was conducted, the Chinese population already met the United Nations' definition of an "aging population" (where persons 65 years and over account for over 7 percent of the total population). The 1 per 1000 sampling survey undertaken by the National Bureau of Statistics in 2004 shows that the proportion of the population aged 65 years and older was 8.58 percent (DPES-NBS, 2005). Accordingly, the age structure of the Chinese population has transformed from a typical pyramid characterized as a broad base of youth and rapidly tapering top of the elderly to a barrel-shaped pyramid. According to the United Nations' prediction, the population age structure of China will become much more of a reverse pyramid with a large proportion of elderly and a small proportion of youth in 2030 (see Figure 1).

If the aging process in China were the natural result of a demographic transition that in most developed countries is accompanied by an increase in productivity and per capita income, China would have no particular difficulty in coping with it, but would follow what other countries have done by upgrading its industrial and technological structures and establishing an effective pension system. However, demographic transition in China has been the mixed result of socioeconomic development and implementation of a rigid family-planning program, which has made the transition not only the world's largest, but also unique. The aging population has raised a great challenge to China to support its elderly and to sustain economic growth. As a result of the aging population, the growth rate and the absolute amount of the working age population will decline, which will lead to an inevitable labor shortage, a challenge that the Chinese economy will have to confront. How will China maintain its competitiveness in international commodity markets and, therefore, sustain economic growth 20 years from now is the question that the present paper tries to

Figure 1. Projection on Population Age Structure
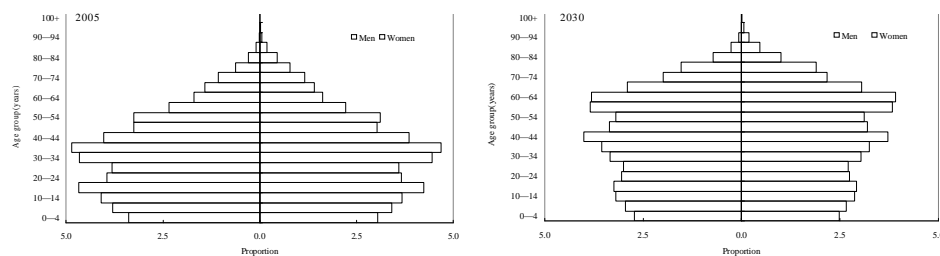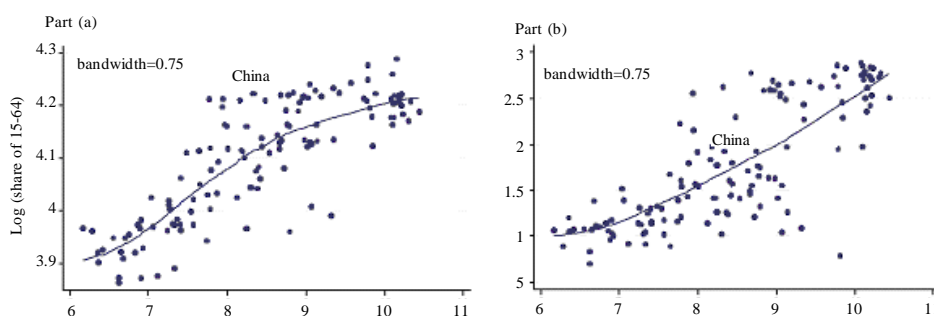

Source: UN (2003).

answer.

The rest of the paper is organized as follows. Section II examines the forthcoming labor shortage under circumstances of aging without affluence. Section III reveals the implications of an aging population for China's economic sustainability. Finally, Section IV concludes with some suggestions for policy changes.

II. Forthcoming Labor Shortage in an Aging but not Affluent Economy

Population age structure changes over time in accordance with stages of demographic transition and it is a common phenomenon when socioeconomic development enters a certain phase. By collecting data from 129 countries, we use the LOWESS non-parametric estimation method to depict the relationship between per capita income and age structure and show the result in Figure 2. The graphs on the left and right, respectively, describe the relationships between per capita gross national income (GNI) adjusted by purchasing power parity and the proportion of the working age population (aged 15–64 years old) in the total population and the proportion of elderly (65 years and older) in total population. We point out where China stands in both cases.

The relationships demonstrated in Figure 2 can be explained as follows. At the early stage of development, as per capita GNI increases, the proportions of the working age population and the old age population increase similarly, indicated by the positive slope of the fitted lines in both graphs. When per capita income reaches certain levels, the proportion of the working age population begins to increase in a slower manner, whereas the proportion

Figure 2. Per Capita Income versus Age Structure of Population

Sources: World Bank (2003) and UN (2003).
Notes: Purchasing power parity (PPP) adjusted per capita gross national income (GNI) is for 2001; proportion of population age is for 2000.

of the old age population increases in a faster manner. As is shown in the graphs, the slopes of the fitted lines, after the turning points are reached, become flatter in the former case (see Part (a)) and steeper in the latter case (see Part (b)).

In both graphs, China stands above the fitted lines, indicating that compared to countries with similar levels of per capita income, China has a larger proportion of working age population and old age population. That is, China has not only greeted its golden population structure but also been confronted sooner with an aging population, as the effectively implemented family-planning policies have caused a deep drop in fertility, resulting in a rapid decline in the proportion of youth and a quick increase in the proportion of elderly. When the pace of the decline in the proportion of youth exceeded that of the increase in the proportion of elderly, China began to enjoy a sufficient labor supply, a result of productive population structure. As the demographic transition process continues to carry forward, the growth of the working age population becomes slower and slower, whereas population aging speeds up. In the Figure 2 graphs, China is now around the turning points from which the fitted line for the proportion of the working age population becomes flatter and the fitted line of the proportion of the old age population becomes steeper.

The United Nations predict that the ratio of the working age population to the total population will not stop increasing until 2010, and that the absolute number of the working population will reach its peak of approximately one billion people in 2015, then begin to shrink afterwards (UN, 2003). The China Center for Population and Development predicts a similar pattern of population structure changes: the proportion of the working population will reach its peak of 72.1 percent in 2013 and the total working age population will reach the highest number of 997 million in 2016 (Wang, 2006). The entire process characterizes China as becoming an aging but not an affluent society.

Examining the working age population by dividing it into four groups, 15–24, 25–39, 40–54 and 55–64 years old, we find that during the period of 2000–2030, the proportions of the 15–24 and the 25–39 year old groups in total population will constantly decline, whereas the proportion of the 55–64 year old group will increase and the proportion of the 40–54 year old group will increase first and then decline after a certain point (UN, 2003). This trend indicates that not only the Chinese population ages over time, but also the working age population itself tends to age 25 years from now. Furthermore, if a larger part of the 15–24 year old group continues their schooling as higher education expands and a larger part of the 55–64 year old group quits the labor market as a result of the discouraged worker effect or the income effect (both tend to reduce labor force participation), the labor supply might fall off further.

Observing the already diminishing net growth of the working age population and the constantly increasing demand for workers in non-agricultural sectors during the 11th Five-year Plan period (2006–2010), we can expect a possible gap between supply of and demand

Figure 3. Prediction for Labor Supply and Demand in
Non-agricultural Sectors, 2004–2010
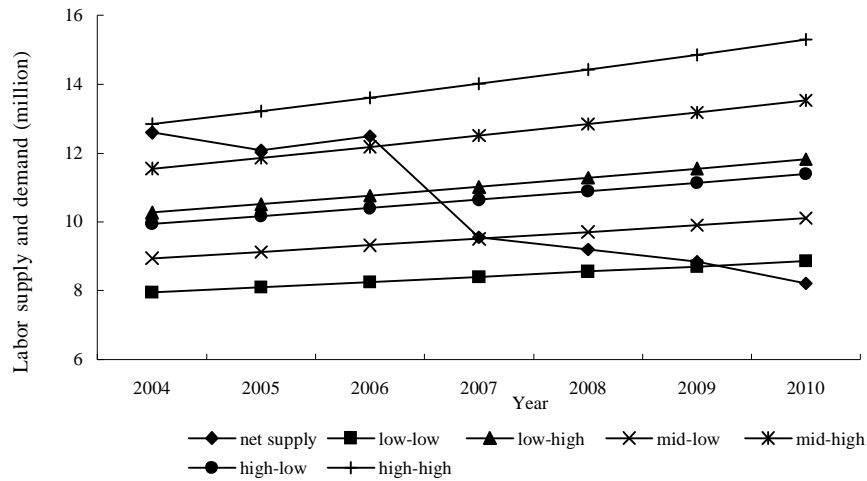
Source: Cai *et al*. (2006).

for labor in the very near future (see Figure 3). We assume that agriculture will have no further demand for workers, therefore, the incremental amount of the working age population is a reasonable labor supply base for non-agricultural sectors. Providing three scenarios of a non-agricultural sector growth rate (high growth of 10 percent, medium growth of 9 percent and low growth of 8 percent) and two employment elasticities for non-agricultural sector growth: 1 percentage point in growth creates a 0.297 percentage rise in employment (the average level during 1991 to 2003) as high elasticity and 1 percentage point in growth creates a 0.230 percentage point rise in employment (a half standard deviation lower than the former) as low elasticity, we plot the six combinations of predicted labor demand of non-agricultural sector growth against the labor supply (incremental working age population). As shown in Figure 3, from 2004 on, the net increase of new entrants to the labor market tends to lag behind the various scenarios of increase in labor demand and the gap widens over time. Although agriculture will continue to release its surplus labor as a result of enhancement of labor productivity in the sector, structural labor shortages in terms of region, sector and specific skills is likely to occur from time to time.

III. The Implications for Economic Growth

Thanks to the favorable labor endowment and increasingly expanded opportunities of employment, economic growth in China has enjoyed ample and low-cost labor supply,

which enables China to transform its advantageous population structure into comparative advantage in labor-intensive industries. As the Chinese economy grew, the economically active population increased from 407 million in 1978 to 768 million in 2004, and total employment in rural and urban areas increased from 402 million to 752 million in the same period. The overall labor force participation rate in rural and urban areas has remained as high as 80–90 percent, the highest in the world. In addition, the higher proportion of the economically active population and higher employment rates have produced greater amounts of economic surplus compared with previous periods and have helped China to gain a high savings rate during the period. Measured by ratio of fixed asset value to GDP, the savings rate was kept over 30 percent in the 1980s and 1990s and is increasing over time in the new millennium (Cai and Wang, 2005).

Demographic transition provided an opportunity for China to take advantage of demographic dividend[1] in the mid 1960s, but only after the initiation of reform could of the opportunity be used to promote economic growth. During the reform period, the potential demographic dividend has been capitalized through trade liberalization, development of factors markets, and fast economic growth. Taking total dependence ratio as proxy of the advantageous population structure (see Figure 4), in the period between 1982 and 2000,

Figure 4. Changes in Population Dependence, 1949-2050
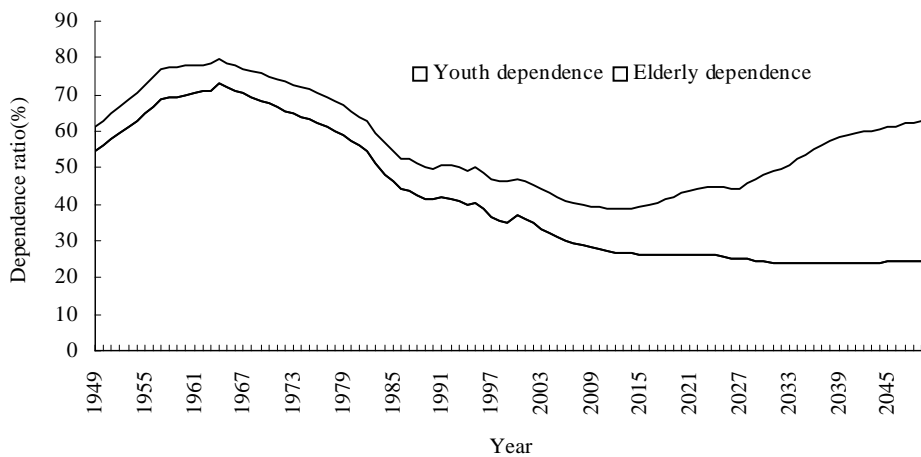
Sources: Figures on dependence are from NBS (various issues); estimations come from Wang (2006).

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[1] As a result of demographic transition, population age structure can be more productive in a certain period of time than in other periods, and, therefore, it adds an extra source of economic growth. This source of growth caused by population structure is recognized as demographic dividend. See Bloom *et al.* (2002).

each 1 percent decrease in the dependence ratio led to a 0.115 percent of growth in per capita GDP, that is, the decline in total dependence rate contributed to one-quarter of the per capita GDP growth in the reform period (Cai and Wang, 2005).

The demographic dividend is performing a typical pattern of "easy come easy go". That is, as a consequence of fast-tracking demographic transition, the earlier the high proportion of working population comes, the sooner it is gone. The fact, on the one hand, that demographic transition in China happened in a short period of time and in a fast manner has no doubt provided China with an extra source of economic growth. On the other hand, it leaves a very short period of time for the Chinese economy to enjoy low population dependence. Population dependence will stay at a low level only for a short while in the second decade of this century and will increase rapidly afterwards (see Figure 4). The lowest point of population dependence will be reached in 2013 when the ratio of the dependent population to the working age population will be 38.8 percent. After that, the population dependence ratio will increase, mainly as a result of the increase in elderly dependence.

Population aging is followed by a reduction in labor supply everywhere at any time in history. However, the impacts of aging on sustainability of economic growth differ across stages of socioeconomic development. In most developed countries that have already finished their demographic transition, population aging is accompanied by high per capita income. The relative abundance of physical and human capital enables these countries to accomplish a necessary upgrading of industrial structure by substituting capital for labor, which generally leads to a transformation from an economy dominated by labor-intensive industry to an economy dominated by capital-intensive industry. The possible occurrence of a shortage of skilled workers in China would result in an increase in skilled workers' wages, which would accordingly tamper China's comparative advantage in labor-intensive industry without a gain in new comparative advantage in capital-intensive industry, because China's per capita income level is still low in terms of international ranking.

As early as 2003, a shortage of migrant workers occurred in the Pearl River Delta region. At that time most observers considered the labor shortage to be a cyclical phenomenon caused by the upsurge of the regional export-driven economy under the circumstances of underpaying, abuse, and lacking of security for migrant workers. As time goes by, the phenomenon of labor shortages has not gone away but has spread to the Yangtze River Delta region, and even to some central provinces, such as Jiangxi, Anhui and Henan, from which migrant laborers are generally sent out. The analysis of population age structure addressed in the present paper suggests that the causes of labor shortages have a demographic root and, therefore, tend to intensify over time. Since the 1990s, wage rates in China's manufacturing sector have increased in a fast manner in comparison with most

parts of the world, which will soon lead to a dent in international competitiveness in manufacturing (Banister, 2005; Cai, 2005).

IV. Conclusions and Policy Suggestions

It is required that GDP growth be maintained at a reasonably high speed if China is to accomplish its goal of building up a well-off society with total GDP being 4 times that of 2000 by 2020. The demand for labor, especially by the manufacturing and the service sectors, will be strong in the following decades of continued economic growth. The aging population, however, is reducing the increase in the working age population and before absolute labor shortage occurs, structural shortages will occur frequently. Furthermore, not only might the high savings rate in China drop because of its aging population, but international capital flows might become uncertain because of global aging (Jackson, 2005). To avoid such a situation, where labor shortages and falls in savings rate might weaken the sustainability of long-term economic growth, a package of policies should be implemented in the following areas.

First, full exploitation of the remaining demographic dividend depends upon the expansion of employment and the accumulation of human capital. Although demographic dividend is rooted in a young population structure, labor market functioning contributes to how much an economy can take advantage of this extra source of growth. Since the late 1990s, the macroeconomic slowdown, industry structural adjustment required by joining the WTO and radical restructuring of state-owned enterprises (SOEs) have led to severe layoffs, unemployment and involuntary departures from the labor market, discounting China's demographic dividend. In urban China, the International Labor Organization recommended surveyed unemployment rate increased from 4.0 percent in 1995 to 7.6 percent in 2000 and 5.8 percent in 2004, whereas labor force participation rate declined from 83.1 percent in 1995 to 75.8 percent in 2000 and 71.6 percent in 2004 (Cai *et al*., 2006). Meanwhile, the trend of employment informalization gives rise to insufficient working hours. This indicates that the present labor market situation has not fully taken advantage of the potential demographic dividend under the current population age structure.

With the forthcoming reverse population dynamics and, therefore, diminishing demographic dividend, the more efficiently the labor force is utilized, the longer the demographic dividend can last by maintaining sufficient labor supply and a high savings rate. Putting employment first should be taken by the government as its strategic measure, that is, all government policies, national and regional development programs, and regulations should be evaluated by whether they can create employment opportunities.

Although the demographic dividend embodied in labor force numbers is disappearing, more human capital can be accumulated by investing in education and health so as to fill the gap between the needed and available skilled workers. The first manifestation of the transformation from a productive population structure to a disadvantageous population structure is a shortage of skilled workers: the labor shortage observed in coastal areas is a result of shortages in skills. The large gap in education and health development between rural and urban areas is also an opportunity for the government to gain allocative efficiency through redistribution of resources between the two areas. A better functioning labor market can provide correct returns to human capital and, therefore, offer incentives for individuals and families to invest in education and health.

Second, labor market development requires institutional innovation. International experiences suggest that once labor shortages emerge, a host of institutional arrangements change accordingly. For example, state policies become more balanced in the provision of public services between rural and urban areas, government regulations tend to abolish institutional barriers deterring labor mobility and to protect labor rights, industrial relations shift from favoring employers to favoring employees, and trade union plays more of a role in coordinating interests between employers and employees. The unique household registration (*hukou*) system established in the beginning of the planning system in the late 1950s still serves as an institutional obstacle preventing the rural labor force from permanently migrating to and working in cities. This is the best time for China to readjust institutional arrangements to acclimatize itself to a new era of labor market.

China's further economic development will still depend on resource reallocation efficiency gained from labor mobility. In 2020, China will be among the group of middle-income countries in terms of purchasing power parity. Following the pattern of middle-income countries, whose average share of rural population is 23 percent, China is expected to transfer hundred of thousands of its rural laborers to urban areas, even if total population numbers in rural areas do not increase. This transfer will continue to produce resource reallocation effects as well as to reduce the existing income gap between rural and urban residents. A World Bank simulation suggests that moving 1, 5 and 10 percent of the labor force out of agriculture and distributing them into the other sectors will, respectively, add 0.7, 3.3 and 6.4 percent to China's total GDP (World Bank, 2005). In their model, Whalley and Zhang (2004) testify that while removing migration restrictions, wage and income inequality disappears. Abolition of the various institutional obstacles that hinder the development of labor markets will not only enhance migration flows, but also make movement rational, by helping create a development climate and job opportunities suitable for labor mobility, which, in turn, matures the conditions for *hukou* reform. The Chinese Government, which has a planned specific development goal for its next 10–20 years, should grasp every

opportunity to push institutional reforms and to encourage labor migration.

Third, sustaining rapid economic growth requires a fundamental transformation of the growth pattern in China. In the economic development process of industrialized economies, the limitation of population growth and, therefore, labor scarcity have generated a possible phenomenon of diminishing returns to capital, which have led to a transformation of economic growth patterns from input-driven to productivity increase-driven growth in those economies. The more rapidly completed demographic transition in East Asian economies, including in China, has offered them with demographic dividend (Bloom *et al.*, 2002; Cai and Wang, 2005), so as to defer the phenomenon of diminishing returns to capital. As the demographic transition continues, the characteristic of an unlimited labor supply eventually disappears and an era of labor shortage arrives, which urgently requires a transformation of growth pattern. The Chinese economy is now facing the transformation from input-driven to productivity-driven economic growth.

Attributed mainly to the expansion of non-public sectors, the reform of SOEs and the development of production factors markets, the growth rate of total factor productivity (TFP) and its contribution to overall growth increased during the years of reform. However, there have been several shortcomings in terms of TFP enhancement: (i) allocative effect of resources takes a lion share of TFP contribution to growth (Cai and Wang, 1999); (ii) whereas TFP growth in agriculture, transportation, post and telecommunications have had impressive performances, TFP growth in industry, construction and services are slow or have even decreased (Hu and McAleer, 2002); (iii) if overall growth of productivity is categorized as market productivity and environment productivity, while the former increases, the latter virtually declines (Kaneko and Managi, 2004); and (iv) after a substantial enhancement of TFP in the early years of reform, since the mid 1990s the TFP has grown at a much lower rate (Zheng and Hu, 2004). All those characteristics revealed above imply that the Chinese economy has not transformed its growth pattern from an input-based one to a productivity-based one. As the advantage in labor supply disappears, diminishing returns to capital will sooner or later occur if the sustainability of economic growth is not based on elevated productivity.

Finally, in forming population policy, precautions should be taken for the imbalanced population structure in the future. Concerning population policy, despite the existent advocacy for continuing the birth control policy, a majority of scholars and even some government officials argue that the one-child policy, as an interim policy, has reached its objective, and that now is the time for adjusting the policy (see Cai, 2006). In practice, policy revisions have already been carried out in a gradual way and on a minor scale. For example, since the Family-planning Law has granted autonomy to local governments to decide under what conditions a second child is allowed, almost all Chinese cities have

permitted couples who both come from one-child families to bear a second child. In this way, on the one hand, the government fulfills its promise that the one-child policy is a one-generation policy; on the other hand, the serious problems of population structure can be partially eased. In those cities where population growth has been too slow, even more relaxed criteria exist for bearing a second child. As for the national policy orientation, permission to bear a second child is expected, it is only the matter of when and how to be determined.

The aging population is in fact a matter of development, and there are a variety of ways to achieve sustained economic growth. Correctly choosing a development strategy that can best take advantage of comparative advantage endowed at the relevant stages of development, and timely transformation of growth patterns to productivity enhancement-based growth are the best approaches to meet the challenge of an aging population.

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